

## Supplemental Appendix

### The Shape of the Tax: Round Prices and Bunching at New York City’s 2019 Transfer-Tax Notches

Pablo Loschi · 14 October 2026

This appendix holds the robustness tables the paper cites, including the thresholds above \$5,000,000 (Table A3) and the split by seller (Table A8), the recording-tax calculation and the replication manifest. Table and section numbers in the paper are cited as “of the paper” throughout. Like the paper, Tables A3 and A6–A8 use one row per deed; Tables A1, A2, A10, A11 and A12 use every row of the sales file.

## A. Robustness of the differenced bunching estimates

Referenced in Section 4.6 of the paper and Section F below; robustness of Table A10.

**Table A1:** The differenced result across period definitions

| Specification                    | \$1M (control) | \$2M   | \$3M   |
|----------------------------------|----------------|--------|--------|
| Baseline                         | +0.005         | +0.220 | +0.461 |
| Drop COVID, post = 2022–2025     | +0.000         | +0.213 | +0.514 |
| Clean pre-period, 2016–2018 only | +0.007         | +0.221 | +0.465 |
| Tight window, 2017–18 vs 2020–21 | +0.014         | +0.202 | +0.311 |
| Late only, post = 2023–2025      | −0.006         | +0.216 | +0.531 |

*Notes.* Across eight estimator variants at \$2,000,000 (window  $\pm$ \$300,000/\$400,000/\$500,000, bins of \$10,000 or \$20,000, polynomial degree 3, 5 or 7, a wider exclusion band, and round-number controls on or off), the *difference* ranges from 0.136 to 0.233 and is never negative, while the *level* in the pre-period ranges from  $-0.032$  to  $+0.223$ . Differencing absorbs most of the specification error and levels do not, which is the methodological reason for preferring the differenced design.

## B. Charm pricing by buyer type

Referenced in Section G below. Reported there with its limitations, since the cells are small and the corresponding split of the bunching magnitudes is not distinguishable from specification noise.

**Table A2:** Charm pricing by buyer type

| Threshold           | Buyer-side jump | Cash buyers        | Financed buyers           | Ratio |
|---------------------|-----------------|--------------------|---------------------------|-------|
| \$500,000           | \$0             | 4.2% (27 of 644)   | <b>7.1%</b> (80 of 1,125) | 1.70  |
| \$1,000,000         | \$10,000        | 70.8% (131 of 185) | <b>88.1%</b> (379 of 430) | 1.24  |
| \$2,000,000         | \$5,000         | 12.1% (26 of 214)  | <b>22.2%</b> (70 of 316)  | 1.82  |
| \$3,000,000         | \$7,500         | 10.9% (12 of 110)  | <b>32.0%</b> (40 of 125)  | 2.93  |
| \$1,500,000 placebo | —               | 0.4% (2 of 462)    | 0.5% (5 of 921)           | —     |
| \$2,500,000 placebo | —               | 0.0% (0 of 199)    | 0.0% (0 of 268)           | —     |

*Notes.* Computed on the matched four-borough panel, since a financing flag is needed; counts are therefore smaller than in Table A11 and Staten Island is absent. **At every threshold, financed buyers price one dollar below it more often than cash buyers do**, by a factor of 1.2 to 2.9, while the two never-taxed placebos show nothing for either type. Pricing at  $X - 1$  avoids a tax jump at the three buyer-paid thresholds, but not at \$500,000. The counts are descriptive and do not identify an effect of financing. The bunching estimates do not split the same way. By buyer type they differ by about as much at four never-taxed placebo prices as at the thresholds (Section G).

## C. The full 2019 schedule, who responds, and the replacement: detail

This section supports Section 4.5 of the paper and Sections G and I below. The extended price sample is a fresh, count-verified retrieval of the same Department of Finance resource with the same building-class filter and no upper price limit (729,047 residential records; 442,497 above \$300,000). Its \$300,000–\$6,000,000 slice is identical, sale for sale, to the archived 431,471-sale sample used in Tables A10 and A11. The paper and Table A3 keep one row per deed.

**Table A3:** Mass just below each threshold, before and after the reform

| Threshold    | Statute              | Pre: below/above | Post: below/above | $\Delta \log S$ [95% CI] |
|--------------|----------------------|------------------|-------------------|--------------------------|
| \$500,000    | NYC RPTT, 1989       | 1367/1229        | 1685/1829         | −0.188 [−0.290, −0.087]  |
| \$1,000,000  | mansion 1402-a, 1989 | 2363/90          | 6460/192          | +0.248 [−0.007, +0.503]  |
| \$2,000,000  | 1402-b, 2019         | 167/383          | 1011/408          | +1.737 [+1.522, +1.953]  |
| \$3,000,000  | 1402-b + base, 2019  | 101/223          | 527/213           | +1.698 [+1.414, +1.982]  |
| \$5,000,000  | 1402-b, 2019         | 52/76            | 295/64            | +1.908 [+1.463, +2.352]  |
| \$10,000,000 | 1402-b, 2019         | 22/21            | 83/11             | +1.974 [+1.107, +2.842]  |
| \$15,000,000 | 1402-b, 2019         | 7/25             | 24/23             | +1.316 [+0.301, +2.330]  |
| \$20,000,000 | 1402-b, 2019         | 5/11             | 14/14             | +0.788 [−0.502, +2.079]  |
| \$25,000,000 | 1402-b, 2019         | 1/4              | 12/12             | +1.386 [−0.947, +3.719]  |
| \$1,500,000  | placebo              | 270/653          | 629/1547          | −0.017 [−0.186, +0.153]  |
| \$1,750,000  | placebo              | 138/418          | 278/941           | −0.111 [−0.345, +0.123]  |
| \$2,250,000  | placebo              | 100/237          | 200/604           | −0.242 [−0.526, +0.041]  |
| \$2,500,000  | placebo              | 145/271          | 315/646           | −0.093 [−0.335, +0.150]  |
| \$4,000,000  | placebo              | 72/135           | 123/236           | −0.023 [−0.383, +0.337]  |
| \$6,000,000  | placebo              | 44/69            | 86/144            | −0.066 [−0.529, +0.397]  |
| \$7,000,000  | placebo              | 29/47            | 63/93             | +0.093 [−0.469, +0.656]  |
| \$8,000,000  | placebo              | 23/39            | 33/85             | −0.418 [−1.072, +0.235]  |
| \$12,000,000 | placebo              | 6/25             | 11/56             | −0.200 [−1.301, +0.900]  |

$S$  compares sales in  $[0.99X, X)$  with sales in  $[X, 1.01X)$ , so it captures pricing a few thousand dollars below a threshold as well as one dollar below. At \$5,000,000, sales at \$4,995,000 rose from 7 before the reform to 77 after. One row per deed. Pre is January 2016 to March 2019, post January 2020 to December 2025; Poisson intervals. The always-treated \$500,000 and \$1,000,000 rows measure drift and show no reform response.

**Table A4:** Charm pricing by loan-to-value, financed house purchases

| Threshold   | Payer  | $N$ at $X - 1$ or $X$ | Charm share (%) | By LTV tercile, low / mid / high (%) | Median LTV |
|-------------|--------|-----------------------|-----------------|--------------------------------------|------------|
| \$500,000   | seller | 868                   | 7.3             | 5.2 / 6.5 / 10.7                     | 0.82       |
| \$1,000,000 | buyer  | 335                   | 88.7            | 87.3 / 96.6 / 81.0                   | 0.77       |
| \$2,000,000 | buyer  | 213                   | 23.5            | 16.9 / 17.3 / 37.3                   | 0.70       |
| \$3,000,000 | buyer  | 79                    | 29.1            | 22.2 / 37.0 / 28.0                   | 0.67       |

Financed house purchases recorded at exactly  $X - 1$  or  $X$  with a positive loan amount and  $0 < \text{LTV} \leq 1$ . This table uses houses, and Table A9 adds condominium loans from the separate deposited file. Pooling the three buyer-paid thresholds with threshold and year fixed effects and parcel-clustered errors, the charm probability changes by +0.3 points per ten points of LTV (s.e. 0.9), and by -12.3 points for LTV of 0.80 or more (s.e. 3.4). At \$500,000, where pricing one dollar below saves no tax (the city's higher rate applies only above \$500,000), the slope is +1.0 (s.e. 0.6).

**Table A5:** Mean change in tax per purchase under each replacement, by price band (\$)

| Price band  | Flat 0.88% |         | 1.56% above \$500k |         | Two brackets |         |
|-------------|------------|---------|--------------------|---------|--------------|---------|
|             | Financed   | Cash    | Financed           | Cash    | Financed     | Cash    |
| \$300k–500k | -2,622     | +3,574  | -6,324             | +0      | -6,324       | +0      |
| \$500k–1M   | -4,018     | +6,531  | -6,691             | +3,813  | -7,312       | +3,208  |
| \$1M–2M     | -5,112     | +12,482 | -3,456             | +14,407 | -5,646       | +12,120 |
| \$2M–6M     | -9,719     | +28,311 | +3,356             | +42,584 | +10,836      | +51,932 |

New tax minus the gross schedule-implied recording charge on the purchase, averaged within band and payment method; static, statutory incidence; four boroughs (Staten Island excluded). Schedules as in Section I below.

On every row of the sales file, without collapsing deeds (`collapsed_counts.py`), the just-below shift is +1.68 at \$2,000,000, +0.93 at \$10,000,000 and +1.31 at \$15,000,000.

## D. Placebo inference, markets and deed screens: detail

This section supports Sections 4.5 and 4.7 of the paper. Table A6 lists the post-minus-pre statistics at each of the sixteen never-taxed prices behind Table 6 of the paper, next to the four thresholds. Table A7 gives both statistics, with window sizes, for every row of Table 8 of the paper.

**Table A6:** Every core placebo, with the treated thresholds for comparison

| Price                                                                    | Sales in window, pre/post | Bunching, post – pre | $\Delta \log R$ |
|--------------------------------------------------------------------------|---------------------------|----------------------|-----------------|
| <i>Never-taxed placebos</i>                                              |                           |                      |                 |
| \$1,300,000                                                              | 17,449/41,222             | −0.011               | −0.016          |
| \$1,350,000                                                              | 17,297/40,829             | +0.042               | −0.032          |
| \$1,400,000                                                              | 16,683/39,442             | +0.004               | +0.006          |
| \$1,450,000                                                              | 16,051/38,118             | −0.077               | +0.072          |
| \$1,500,000                                                              | 15,624/36,973             | +0.015               | +0.006          |
| \$1,550,000                                                              | 14,697/35,097             | +0.011               | −0.021          |
| \$1,600,000                                                              | 13,815/32,900             | −0.045               | +0.026          |
| \$1,650,000                                                              | 12,885/30,867             | −0.021               | +0.030          |
| \$3,800,000                                                              | 3,563/7,453               | +0.038               | −0.109          |
| \$3,850,000                                                              | 3,503/7,401               | +0.064               | −0.122          |
| \$3,900,000                                                              | 3,414/7,211               | +0.031               | −0.075          |
| \$3,950,000                                                              | 3,325/7,046               | +0.072               | +0.002          |
| \$4,000,000                                                              | 3,321/7,063               | −0.056               | +0.091          |
| \$4,050,000                                                              | 3,257/6,902               | +0.031               | +0.142          |
| \$4,100,000                                                              | 3,176/6,703               | +0.024               | +0.125          |
| \$4,150,000                                                              | 3,074/6,500               | −0.071               | +0.163          |
| <i>Thresholds (\$1,000,000 always taxed; the others created in 2019)</i> |                           |                      |                 |
| \$1,000,000                                                              | 27,575/61,880             | +0.059               | −0.113          |
| \$2,000,000                                                              | 9,250/22,421              | +0.223               | −0.350          |
| \$3,000,000                                                              | 5,233/11,607              | +0.384               | −0.459          |
| \$5,000,000                                                              | 2,367/5,024               | +0.287               | −0.479          |

Estimator, windows and pre/post periods as in Table 5 of the paper. Placebos are the \$50,000 multiples between \$1,200,000 and \$6,000,000 whose window  $[0.8X, 1.2X)$  holds no statutory threshold. Placebo bunching changes: mean +0.003, standard deviation 0.046, maximum +0.072. Source: `placebo_inference.py`.

**Table A7:** The response by market and after deed screens, both statistics

|                                                              | Pre-reform sales<br>in window | Bunching, post – pre<br>(placebos as large) | $\Delta \log R$<br>(placebos as low) | $z$ against<br>placebo SD |
|--------------------------------------------------------------|-------------------------------|---------------------------------------------|--------------------------------------|---------------------------|
| <i>All sales</i> (placebo SD 0.046)                          |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 27,575                        | +0.059 (2)                                  | –0.113 (1)                           | +1.2                      |
| \$2,000,000                                                  | 9,250                         | +0.223 (0)                                  | –0.350 (0)                           | +4.8                      |
| \$3,000,000                                                  | 5,233                         | +0.384 (0)                                  | –0.459 (0)                           | +8.3                      |
| \$5,000,000                                                  | 2,367                         | +0.287 (0)                                  | –0.479 (0)                           | +6.2                      |
| <i>Houses</i> (placebo SD 0.159)                             |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 15,170                        | +0.005 (8)                                  | +0.068 (12)                          | –0.1                      |
| \$2,000,000                                                  | 2,642                         | +0.292 (2)                                  | –0.639 (0)                           | +1.7                      |
| \$3,000,000                                                  | 1,003                         | +0.485 (0)                                  | –0.611 (0)                           | +2.9                      |
| \$5,000,000                                                  | 299                           | +0.438 (0)                                  | –0.849 (0)                           | +2.6                      |
| <i>Condominiums</i> (placebo SD 0.083)                       |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 7,578                         | +0.151 (1)                                  | –0.235 (0)                           | +1.8                      |
| \$2,000,000                                                  | 4,258                         | +0.196 (0)                                  | –0.235 (0)                           | +2.3                      |
| \$3,000,000                                                  | 2,939                         | +0.376 (0)                                  | –0.439 (0)                           | +4.5                      |
| \$5,000,000                                                  | 1,571                         | +0.247 (0)                                  | –0.312 (0)                           | +2.9                      |
| <i>Co-operatives</i> (placebo SD 0.173)                      |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 4,827                         | +0.035 (7)                                  | –0.110 (2)                           | +0.2                      |
| \$2,000,000                                                  | 2,350                         | +0.192 (3)                                  | –0.208 (2)                           | +1.1                      |
| \$3,000,000                                                  | 1,291                         | +0.352 (0)                                  | –0.398 (0)                           | +2.1                      |
| \$5,000,000                                                  | 497                           | +0.275 (1)                                  | –0.737 (0)                           | +1.6                      |
| <i>Manhattan</i> (placebo SD 0.060)                          |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 7,429                         | +0.091 (0)                                  | –0.165 (0)                           | +1.4                      |
| \$2,000,000                                                  | 5,431                         | +0.225 (0)                                  | –0.265 (0)                           | +3.6                      |
| \$3,000,000                                                  | 3,846                         | +0.355 (0)                                  | –0.421 (0)                           | +5.8                      |
| \$5,000,000                                                  | 2,037                         | +0.220 (0)                                  | –0.367 (0)                           | +3.5                      |
| <i>Other four boroughs</i> (placebo SD 0.076)                |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 20,146                        | +0.040 (3)                                  | –0.048 (3)                           | +0.6                      |
| \$2,000,000                                                  | 3,819                         | +0.212 (0)                                  | –0.423 (0)                           | +2.9                      |
| \$3,000,000                                                  | 1,387                         | +0.499 (0)                                  | –0.536 (0)                           | +6.7                      |
| \$5,000,000                                                  | 330                           | +0.680 (0)                                  | –0.994 (0)                           | +9.1                      |
| <i>No company seller</i> (placebo SD 0.070)                  |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 15,182                        | +0.021 (7)                                  | –0.041 (0)                           | +0.1                      |
| \$2,000,000                                                  | 3,789                         | +0.339 (0)                                  | –0.617 (0)                           | +4.7                      |
| \$3,000,000                                                  | 1,788                         | +0.387 (0)                                  | –0.508 (0)                           | +5.4                      |
| \$5,000,000                                                  | 584                           | +0.504 (0)                                  | –0.647 (0)                           | +7.1                      |
| <i>Company seller (sponsor proxy)</i> (placebo SD 0.178)     |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 3,954                         | +0.082 (6)                                  | –0.111 (5)                           | +0.4                      |
| \$2,000,000                                                  | 2,099                         | +0.079 (6)                                  | –0.165 (4)                           | +0.4                      |
| \$3,000,000                                                  | 1,457                         | +0.431 (0)                                  | –0.550 (0)                           | +2.4                      |
| \$5,000,000                                                  | 885                           | +0.124 (5)                                  | –0.330 (0)                           | +0.7                      |
| <i>Without legal-rule deeds</i> (placebo SD 0.046)           |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 27,414                        | +0.055 (2)                                  | –0.103 (2)                           | +1.1                      |
| \$2,000,000                                                  | 9,236                         | +0.227 (0)                                  | –0.355 (0)                           | +4.9                      |
| \$3,000,000                                                  | 5,231                         | +0.389 (0)                                  | –0.459 (0)                           | +8.4                      |
| \$5,000,000                                                  | 2,367                         | +0.288 (0)                                  | –0.482 (0)                           | +6.2                      |
| <i>Without any lender or referee deed</i> (placebo SD 0.047) |                               |                                             |                                      |                           |
| \$1,000,000                                                  | 27,246                        | +0.054 (2)                                  | –0.102 (2)                           | +1.1                      |
| \$2,000,000                                                  | 9,220                         | +0.229 (0)                                  | –0.357 (0)                           | +4.8                      |
| \$3,000,000                                                  | 5,223                         | +0.387 (0)                                  | –0.457 (0)                           | +8.2                      |
| \$5,000,000                                                  | 2,366                         | +0.291 (0)                                  | –0.487 (0)                           | +6.1                      |

Placebo counts are out of sixteen, computed within each row's sample. Source: `market_splits.py`.

## E. Sales with and without a company seller, and the loan-to-value test with condominium loans

This section supports Section 4.7 of the paper and Section G below. Table A8 splits the response by whether the linked deed names a company as seller, a proxy that includes sponsor sales and other company sales, and adds condominiums in new buildings and a late post-period. Each group is normalized within its own sample, so the rows do not divide the aggregate shift between groups. Table A9 reruns the loan-to-value test of Section G with condominium loans from the linked dataset.

**Table A8:** Sales with and without a company seller

|                                                                               | Sales in window<br>pre/post | Bunching, post – pre<br>(placebos as large) | $\Delta \log R$<br>(placebos as low) | $z$ against<br>placebo SD |
|-------------------------------------------------------------------------------|-----------------------------|---------------------------------------------|--------------------------------------|---------------------------|
| <i>All sales, no company seller</i> (placebo SD 0.070)                        |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 15,182/32,943               | +0.021 (7)                                  | –0.041 (0)                           | +0.1                      |
| \$2,000,000                                                                   | 3,789/9,478                 | +0.339 (0)                                  | –0.617 (0)                           | +4.7                      |
| \$3,000,000                                                                   | 1,788/3,955                 | +0.387 (0)                                  | –0.508 (0)                           | +5.4                      |
| \$5,000,000                                                                   | 584/1,522                   | +0.504 (0)                                  | –0.647 (0)                           | +7.1                      |
| <i>All sales, company seller</i> (placebo SD 0.178)                           |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 3,954/9,890                 | +0.082 (6)                                  | –0.111 (5)                           | +0.4                      |
| \$2,000,000                                                                   | 2,099/5,724                 | +0.079 (6)                                  | –0.165 (4)                           | +0.4                      |
| \$3,000,000                                                                   | 1,457/3,655                 | +0.431 (0)                                  | –0.550 (0)                           | +2.4                      |
| \$5,000,000                                                                   | 885/1,774                   | +0.124 (5)                                  | –0.330 (0)                           | +0.7                      |
| <i>Condominiums, no company seller</i> (placebo SD 0.272)                     |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 3,688/6,580                 | +0.071 (6)                                  | –0.156 (2)                           | +0.1                      |
| \$2,000,000                                                                   | 1,907/3,951                 | +0.324 (2)                                  | –0.436 (0)                           | +1.0                      |
| \$3,000,000                                                                   | 1,089/2,135                 | +0.387 (2)                                  | –0.397 (0)                           | +1.3                      |
| \$5,000,000                                                                   | 379/863                     | +0.324 (2)                                  | –0.372 (0)                           | +1.0                      |
| <i>Condominiums, company seller</i> (placebo SD 0.130)                        |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 2,060/4,878                 | +0.134 (3)                                  | –0.151 (2)                           | +1.0                      |
| \$2,000,000                                                                   | 1,457/3,967                 | +0.065 (5)                                  | –0.121 (3)                           | +0.5                      |
| \$3,000,000                                                                   | 1,212/2,868                 | +0.380 (0)                                  | –0.550 (0)                           | +2.9                      |
| \$5,000,000                                                                   | 816/1,510                   | +0.104 (4)                                  | –0.252 (0)                           | +0.8                      |
| <i>Condominiums, company seller, post-period 2022–2025</i> (placebo SD 0.135) |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 2,060/3,169                 | +0.135 (4)                                  | –0.092 (5)                           | +1.0                      |
| \$2,000,000                                                                   | 1,457/2,715                 | +0.022 (7)                                  | –0.072 (5)                           | +0.2                      |
| \$3,000,000                                                                   | 1,212/2,050                 | +0.413 (0)                                  | –0.655 (0)                           | +3.1                      |
| \$5,000,000                                                                   | 816/1,069                   | +0.201 (0)                                  | –0.329 (0)                           | +1.5                      |
| <i>Condominiums in buildings at most three years old</i> (placebo SD 0.234)   |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 1,231/2,646                 | +0.330 (2)                                  | –0.197 (4)                           | +1.3                      |
| \$2,000,000                                                                   | 567/1,475                   | –0.091 (12)                                 | +0.048 (8)                           | –0.5                      |
| \$3,000,000                                                                   | 471/801                     | +0.532 (1)                                  | –0.194 (4)                           | +2.2                      |
| \$5,000,000                                                                   | 309/319                     | +0.071 (6)                                  | +0.027 (7)                           | +0.2                      |
| <i>Condominiums in older buildings</i> (placebo SD 0.081)                     |                             |                                             |                                      |                           |
| \$1,000,000                                                                   | 6,347/12,312                | +0.130 (1)                                  | –0.246 (0)                           | +1.6                      |
| \$2,000,000                                                                   | 3,691/8,256                 | +0.241 (0)                                  | –0.280 (0)                           | +2.9                      |
| \$3,000,000                                                                   | 2,468/5,332                 | +0.345 (0)                                  | –0.462 (0)                           | +4.2                      |
| \$5,000,000                                                                   | 1,262/2,685                 | +0.283 (0)                                  | –0.368 (0)                           | +3.5                      |

A company seller on the linked deed is a proxy that includes sponsor (developer) sales and other company sales; sales without a linked deed are in neither group. Buildings at most three years old use the Department of Finance year

built. Share of condominium window sales with a company seller: \$1,000,000, 27% before and 33% after; \$2,000,000, 34% before and 41% after; \$3,000,000, 41% before and 47% after; \$5,000,000, 52% before and 50% after. Placebo counts are out of sixteen, computed within each row's sample. Source: `cost_and_sponsors.py`.

**Table A9:** Loan-to-value and the charm price, with condominium loans

| Financed purchases at $X - 1$ or $X$  | $N$   | Charm (%) | Per 10 LTV points | LTV $\geq 80\%$ |
|---------------------------------------|-------|-----------|-------------------|-----------------|
| Houses (as in the paper)              | 627   | 59.0      | +0.3 (0.9)        | -12.3 (3.4)     |
| Condominiums                          | 210   | 45.2      | 0.0 (1.4)         | -17.5 (6.7)     |
| Houses and condominiums               | 837   | 55.6      | +0.2 (0.8)        | -13.2 (3.0)     |
| Seller-paid \$500,000 notch (placebo) | 1,034 | 7.2       | +0.7 (0.6)        | -2.0 (1.7)      |

Linear probability of a price of  $X - 1$ , in percentage points, with threshold and year effects (and a condominium effect where both types are pooled); standard errors clustered by parcel in parentheses. Buyer-paid thresholds \$1,000,000, \$2,000,000 and \$3,000,000; the \$500,000 row pools houses and condominiums at the seller-paid notch. Condominium loans come from `data/condo_loans.csv.gz`, matched as in the costing. Source: `cost_and_sponsors.py`.

## F. The fixed-window design and the four residential notches

Referenced in Sections 2.1 and 4.6 of the paper.

Table A10 applies a fixed  $\pm\$400,000$  window with \$10,000 bins and an exclusion band of  $-\$50,000$  to  $+\$100,000$ . At the always-treated control the missing share is 0.508 before the reform and 0.513 after; at \$2,000,000 it rises from 0.094 to 0.314 and at \$3,000,000 from  $-0.117$  to 0.344. Table A1 shows the same differences across period definitions. Table A11 counts sales one dollar below and at each of the four residential notches, including the city’s \$500,000 threshold, where a sale at exactly \$500,000 already pays the lower rate.

**Table A10:** The fixed-window design: bunching at \$1,000,000, \$2,000,000 and \$3,000,000, differenced across the 2019 reform

| <i>Panel A. Share of counterfactual mass missing above the threshold</i> |                                               |          |                            |                    |                    |
|--------------------------------------------------------------------------|-----------------------------------------------|----------|----------------------------|--------------------|--------------------|
| Threshold                                                                | Status in 2019                                | Pre      | Post                       | Difference         | 95% CI             |
| \$1,000,000                                                              | taxed throughout                              | 0.508    | 0.513                      | <b>+0.005</b>      | $[-0.020, +0.034]$ |
| \$2,000,000                                                              | <b>untaxed <math>\rightarrow</math> taxed</b> | 0.094    | 0.314                      | <b>+0.220</b>      | $[+0.133, +0.320]$ |
| \$3,000,000                                                              | <b>untaxed <math>\rightarrow</math> taxed</b> | $-0.117$ | 0.344                      | <b>+0.461</b>      | $[+0.287, +0.645]$ |
| \$1,500,000                                                              | never taxed                                   | $-0.049$ | $-0.076$                   | $-0.027$           | $[-0.103, +0.055]$ |
| \$2,500,000                                                              | never taxed                                   | $-0.080$ | $-0.096$                   | $-0.016$           | $[-0.148, +0.148]$ |
| <i>Panel B. The same result with no counterfactual fitted</i>            |                                               |          |                            |                    |                    |
| Threshold                                                                | $R$ pre                                       | $R$ post | Log change                 | 95% CI             |                    |
| \$1,000,000                                                              | 0.289                                         | 0.302    | +0.042                     | $[-0.011, +0.092]$ |                    |
| \$2,000,000                                                              | 0.738                                         | 0.531    | <b><math>-0.328</math></b> | $[-0.431, -0.222]$ |                    |
| \$3,000,000                                                              | 0.933                                         | 0.517    | <b><math>-0.591</math></b> | $[-0.764, -0.425]$ |                    |
| \$1,500,000                                                              | 0.763                                         | 0.792    | +0.036                     | $[-0.031, +0.101]$ |                    |
| \$2,500,000                                                              | 0.882                                         | 0.900    | +0.021                     | $[-0.097, +0.148]$ |                    |

*Notes.* Panel B defines  $R(X)$  as the number of transactions in  $[X, X + 100,000)$  divided by the number in  $[X - 150,000, X - 50,000)$ . A notch at  $X$  predicts lower  $R$ , but changing density or transaction composition can also move it. The \$1,000,000 row checks the design. Nothing changed at that threshold in 2019, and the estimate stays at 0.508 before and 0.513 after, on 64,066 and 134,996 transactions in the estimation window. The small fixed-window control change reduces, without eliminating, the concern that the before-and-after comparison picks up general drift in the price distribution. Same conclusion in both panels, and Panel B needs no polynomial. This table uses a fixed  $\pm\$400,000$  window and \$10,000 bins (bootstrap intervals, 600 draws). The paper’s estimates use windows that scale with the threshold ( $\pm 0.2X$ ); the two coincide at \$2,000,000, and at \$3,000,000 the scaled window gives +0.321. Never-taxed round prices whose fixed window would contain the \$2,000,000 threshold (\$1,750,000 and \$2,250,000) are not shown.

## G. Who responds: payment method and loan-to-value

Section 4.4 of the paper notes that financed buyers record a price one dollar below a threshold more often than cash buyers. This section reports the counts and a test of one explanation.

Splitting the charm-price counts of Table A11 by financing status, financed buyers price one dollar below the threshold more often than cash buyers at all four thresholds, by factors of 1.2 to 2.9, while both never-taxed placebos show nothing for either type. Supplemental Appendix Table A2 reports the counts. Three things keep this from being a result. At \$500,000 the charm

**Table A11:** Four residential notches, and the buyer’s share of each

| <i>Panel A. Charm pricing at each threshold, all transactions 2016–2025</i> |            |                |                         |              |              |
|-----------------------------------------------------------------------------|------------|----------------|-------------------------|--------------|--------------|
| Threshold                                                                   | Notch      | In force since | Sales at $X - 1$        | Sales at $X$ | Charm share  |
| \$500,000 (city RPTT) <sup>†</sup>                                          | 0.425 pt   | 1989           | 249                     | 2,911        | 7.9%         |
| \$1,000,000 (mansion)                                                       | 1.00 pt    | 1989           | 728                     | 200          | <b>78.4%</b> |
| \$2,000,000 (§1402-b)                                                       | 0.25 pt    | Jul 2019       | 140                     | 674          | <b>17.2%</b> |
| \$3,000,000 (§1402-b + base)                                                | 0.50 pt    | Jul 2019       | 73                      | 322          | <b>18.5%</b> |
| \$1,500,000 placebo                                                         | —          | —              | 7                       | 1,885        | 0.4%         |
| \$2,500,000 placebo                                                         | —          | —              | 1                       | 802          | 0.1%         |
| <i>Panel B. Statutory payer of each jump</i>                                |            |                |                         |              |              |
| Threshold                                                                   | Total jump |                | Of which the buyer owes |              | Charm share  |
| \$1,000,000                                                                 | \$10,000   |                | <b>\$10,000</b>         |              | 78.4%        |
| \$2,000,000                                                                 | \$5,000    |                | <b>\$5,000</b>          |              | 17.2%        |
| \$3,000,000                                                                 | \$15,000   |                | <b>\$7,500</b>          |              | 18.5%        |
| \$500,000 <sup>†</sup>                                                      | \$2,125    |                | \$0                     |              | 7.9%         |

*Notes.* Charm share is sales at  $X - 1$  as a percentage of sales at  $X - 1$  or  $X$ . <sup>†</sup>**Not comparable with the other rows.** The city’s higher rate applies to consideration *above* \$500,000, so both \$499,999 and \$500,000 pay 1%, and pricing one dollar below saves nothing; the jump is avoided by a price of \$500,000 or less, which is itself a round number. The row’s charm share therefore measures round-number pricing below a salient price, which is a different thing from avoidance, and a boundary-aligned test would need round-number controls this table does not have. Panel B’s incidence follows the statutes: the city’s Real Property Transfer Tax and the state base tax under §1402 are imposed on the *grantor* (Administrative Code §11-2104; Tax Law §1404(a)), while the mansion tax under §1402-a and the supplemental tax under §1402-b are paid by the *grantee*; §1402-b says that “the tax imposed by this section shall be paid by the grantee.” In sponsor (new-development) sales, contracts commonly shift the seller’s transfer taxes to the buyer, so the statutory payer need not be the one who pays. Among the three thresholds where a price one dollar below avoids the jump, the charm share is highest at \$1,000,000, the oldest threshold, which also differs from the others in price level and market, so the comparison cannot isolate an effect of age.

price avoids no tax (Table A11), so there the split measures charm pricing alone. The cells are small. The \$3,000,000 comparison rests on 12 of 110 against 40 of 125, so the ordering is better read as a pattern than as an estimate. And the corresponding split of the *bunching* magnitudes is a null. Applying the Kleven–Waseem estimator separately by buyer type gives differences (financed minus cash) of +0.063, +0.053, +0.165 and  $-0.069$  at the four thresholds, and +0.054, +0.054, +0.004 and  $-0.137$  at four never-taxed placebo prices by the same procedure. That split is within specification noise. The charm-price comparison survives only because it is a count of transactions at two prices with no counterfactual to misspecify.

On cells this small the ordering is suggestive at most. Pricing below a notch is *successful avoidance*, so on this evidence cash buyers pay the notch more often. The claim concerns responsiveness and says nothing about burden. Two readings of *why* are available. Payment method may proxy liquidity, because buyer-side transfer taxes are paid in cash at closing and cannot be financed, and a financed buyer has already committed cash to the down payment. Or a financed transaction involves more professionals (a lender, an appraiser, an attorney preparing a cash-to-close statement), who are more likely to notice the threshold. Loan-to-value separates the two, because the liquidity reading predicts that the most leveraged buyers avoid the notch most. Among 627 financed house purchases recorded at exactly  $X$  or  $X - 1$  at the three buyer-paid thresholds, with threshold and year fixed effects, the probability of the charm price rises by 0.3 percentage points per ten points of loan-to-value (standard error 0.9), and buyers borrowing 80% or more of the price choose it 12 points *less* often (standard error 3.4). The loan-to-value pattern does not support the specified liquidity prediction, and professional intermediation remains one possible explanation. Adding the 210 financed condominium purchases at these prices, with loans from the linked dataset [Loschi, 2026a], changes nothing. Across both types the charm price rises by 0.2 points per ten points of loan-to-value (standard error 0.8), and buyers borrowing 80% or more choose it 13 points less often (standard error 3.0; Supplemental Appendix Table A9).

## H. Counts and composition over equal periods

A fixed-window count comparison adds a transparent accounting check to the density estimates. It compares 2016–2018, 2020–2022 and 2023–2025, omitting 2019, in windows from  $0.95X$  to  $1.05X$ . At the new \$2,000,000, \$3,000,000 and \$5,000,000 notches, the share strictly below the threshold rises by 10.8–16.4 percentage points (Table A12). Standardizing each post-period share to the pre-period property-type composition gives increases of 10.8–16.1 points, and the largest composition component is 0.81 points in absolute value. Separate standardization by company-seller status, with missing flags retained as a category, gives 10.8–16.5 points. Missing seller flags account for about 35–49% of these window samples and cannot be treated as individual sellers. These standardizations address broad observed categories and leave composition within them unaddressed.

Total sales in each new-notch window rise after the reform, as they do around the untaxed references. The counts therefore supply no estimate of transactions prevented by the tax. Pandemic conditions, price growth and other market changes prevent a causal reading of the equal-period volume comparison. Wider  $0.90X$ – $1.10X$  windows give smaller below-share increases of 4.5–12.1 points, or 4.4–11.4 after property-type standardization. This check confirms the local concentration of recorded prices, but transaction losses and incidence are outside its reach.

**Transaction volume.** Green et al. [2026] estimate that Los Angeles’ 4% tax on sales above \$5,000,000, 5.5% from \$10,000,000, reduced transactions by about half. Nothing of that size is visible here. Sales between \$2,000,000 and \$10,000,000 were 35.2% of sales between \$1,000,000 and \$10,000,000 from January 2016 to March 2019 and 32.7% in 2020–2025, a decline of 2.5 points

**Table A12:** Transaction counts and below-threshold shares over equal periods

| Threshold (\$m) | Sales in fixed window |         |         | Share below threshold (%) |         |         |
|-----------------|-----------------------|---------|---------|---------------------------|---------|---------|
|                 | 2016–18               | 2020–22 | 2023–25 | 2016–18                   | 2020–22 | 2023–25 |
| 1               | 6,694                 | 8,943   | 8,231   | 86.5                      | 89.1    | 87.8    |
| 1.5             | 3,257                 | 4,457   | 3,992   | 49.0                      | 50.1    | 47.6    |
| 2               | 1,846                 | 2,588   | 2,553   | 55.2                      | 67.7    | 69.1    |
| 2.5             | 1,582                 | 1,965   | 2,032   | 50.2                      | 48.2    | 48.6    |
| 3               | 1,164                 | 1,458   | 1,454   | 52.7                      | 63.4    | 68.0    |
| 5               | 537                   | 794     | 686     | 50.1                      | 61.2    | 66.5    |

*Notes.* Same all-residential NYC sales universe and \$300,000 lower cutoff as the threshold analysis. Window  $[0.95X, 1.05X)$ , with sales exactly at  $X$  included in the denominator but not the below-threshold count. The \$1m tax is unchanged; \$1.5m and \$2.5m are untaxed reference prices. Counts include unlinked sales. All periods are three years; 2019 is omitted. Detailed composition, missingness and  $\pm 10\%$  window results are in replication package, `transaction_accounting.py`. This table is descriptive, with no counterfactual for the absence of the reform.

although rising nominal prices alone would push that share up. The 2019 steps were an order of magnitude smaller than the Los Angeles rates, and this comparison does not identify a volume effect. Pandemic-era demand shifted across price segments, and counts over equal three-year periods on every row show total sales rising around both taxed and untaxed thresholds (Table A12).

## I. The mortgage recording tax: statute, loans and the gross charge

Referenced in Sections 2.2, 3.2 and 5 of the paper.

**The statute.** New York imposes a tax on the recording of a mortgage on real property [New York State, 2026]. The components are a basic tax of 50 cents per \$100 under Tax Law §253(1); a special additional tax of 25 cents per \$100 under §253(1-a); and, within the Metropolitan Commuter Transportation District, an additional 30 cents per \$100 under §253(2). Section 253-a authorizes a city of one million or more to impose its own by local law, and New York City does.

For a one- to three-family dwelling or an individual condominium unit the aggregate rate is 2.05% on mortgages below \$500,000 and 2.175% at or above. The special additional tax of 25 cents per \$100 is, by the terms of §253(1-a), payable by the mortgagee for property containing not more than six residential dwelling units. What remains with the borrower is therefore **1.80% below \$500,000 and 1.925% at or above**.

A purchaser paying cash records no mortgage and pays none of it.

The magnitude is material relative to the transaction. On a \$900,000 condominium purchased with a \$720,000 mortgage, the unadjusted borrower-side schedule implies \$13,860 before credits, exemptions or consolidation adjustments. Two buyers offering the same price for the same property face different statutory closing charges, and the law assigns the difference to the one who records a purchase mortgage.

**The co-operative gap.** Article 11 of the Tax Law, which imposes the mortgage recording tax, reaches mortgages *of real property*. A co-operative apartment is not real property. The purchaser acquires shares in a corporation and a proprietary lease, and a loan secured by those shares is a security interest in personalty, perfected by filing under the Uniform Commercial Code, to which no

mortgage recording tax attaches. A financed co-operative purchase therefore escapes the tax while a financed condominium purchase of the same value does not, and co-operative purchases appear in the deed-based data as though they were almost all cash. The mansion tax under §1402-a, by contrast, expressly includes “a cooperative apartment unit,” so the two articles draw the boundary of taxable residential property differently.

**Loans and financing.** New York City’s Automated City Register Information System (ACRIS) records every instrument affecting real property **in Manhattan, the Bronx, Brooklyn and Queens**. Richmond County is not in it: Staten Island instruments are recorded by the Richmond County Clerk, and the city’s own guidance directs users there. Applying a deed-based method to Staten Island therefore returns a financed share of 0.0% on 41,445 sales, an artifact of the administrative boundary. Staten Island is therefore excluded from the loan-level statutory-burden measurement of this section. It is retained in Section 4 of the paper, which studies prices rather than financing and needs no ACRIS match.

Two ACRIS tables are used. **Real Property Master** (bnx9-e6tj) supplies document type, consideration or loan amount, document date and recording date; restricted to plain DEED and MTGE documents recorded between 2015 and 2026 it gives **1,354,279 records**. **Real Property Legals** (8h5j-fqxa) supplies borough, block and lot for each document; restricted to the same period, **5,460,074 rows**, of which 3,609,058 resolve to a single parcel. Documents touching several parcels are dropped, since a mortgage spanning multiple lots cannot be attributed to one sale.

Restricting to plain DEED excludes DEED, LE (life estate), DEED, TS, DEEDO, DEED, RC and DEED COR. Correction deeds and life-estate transfers are therefore out of the sample before any further cleaning. This restriction does not remove foreclosure transfers, since referee’s deeds and deeds in lieu of foreclosure are recorded as plain DEED and must be identified from their parties [Loschi, 2026b]. Section 6 of the paper returns to what this implies.

A purchase is classified **financed** if a same-parcel MTGE instrument is dated within  $-15$  to  $+90$  days of the sale, using the document date where available and the recording date otherwise, and **cash** otherwise. Cash therefore means that no such mortgage was matched, and a match says nothing about the loan’s purpose. Purchase-money mortgages are normally recorded with or shortly after the deed. Two variants are reported throughout,  $-15$  to  $+30$  and  $-15$  to  $+180$ . A refinancing that falls inside the window and a purchase mortgage that falls outside it both cause classification errors, which can run in either direction.

**The condominium problem, and its solution.** The parcel identifier does not join directly for condominiums. The Department of Finance bills a condominium unit under a billing lot in the 7501-and-above range, while ACRIS records instruments against the unit lot (1001, 1002 and so on). The two identifiers never meet, and a naive join returns a financed share of 0.0% for every condominium category. PLUTO does not bridge them. It contains 11,253 billing lots and only 2,188 unit lots, and its **condono** field numbers a condominium within a borough rather than linking its constituent units.

The route that works uses the deed itself. **The deed for any given sale is in ACRIS, carrying the consideration and the date, and its legal record carries the unit lot.** A Department of Finance sale can therefore be matched to its own deed on borough and block, consideration within 0.5%, and date within 45 days. The match reveals the unit lot, and the financing question is then asked at the correct parcel. A match is accepted only when it is unique. Where several deeds on a block share a consideration and a date, the sale is dropped rather than guessed. In a large condominium that ambiguity is common, and a wrong lot produces a wrong

financing flag.

The method can be validated, because for one- to three-family dwellings the two identifiers already agree and the recovered lot can be checked against the truth. Of 211,394 house sales attempted, 160,918 find a unique deed, 44,954 find none, 3,042 have no parcel identifier and 2,480 are ambiguous. Among the unique matches the method recovers the correct lot in 160,339 cases, 99.6%.

Applied to condominiums it matches 82,488 sales: 71.4% of the 115,587 attempted, or 73.8% of the 111,743 that carry a usable parcel identifier at all. A sale with no identifier cannot be attempted at all, which is why the two percentages differ. The remainder splits into 20,004 with no deed found, 9,251 ambiguous and 3,844 with no identifier. The financed share among matched condominium sales is 58.3%, against 77.0% for houses in the same four boroughs and 0.0% from a naive join. (The house figure falls to 61.7% when Staten Island is included, for the reason given in Section 3.2 of the paper; the condominium figure does not move, because no Staten Island condominium sale is in the matched set.)

**The analysis sample.** The deed-based panel contains **249,395 transactions in the four ACRIS boroughs**: 166,907 houses and 82,488 condominiums, on 2016–2025 sale dates, each with a price, a date, a parcel and a financing flag. A further 41,445 Staten Island house sales are in the sales file but carry no usable financing flag, because ACRIS holds no Staten Island instruments, and are excluded. This panel, restricted to purchases with an observed loan amount, is what this section measures the recording-tax burden on. Section 4 of the paper works instead on the sales file, one row per deed, including its extension above \$6,000,000, since both need prices and dates but no financing flag.

**The gross schedule-implied charge on observed loans.** The recording tax is levied on the loan rather than the sale, so the gross schedule-implied charge as a share of price depends on the recorded loan-to-price ratio. The ACRIS match records the loan amount alongside the price for most financed purchases, so that ratio can be measured instead of assumed. It is measured separately for each market, since houses and condominiums have different price levels and different loan-to-value distributions and the tax schedule is not proportional. House loan amounts are carried in the deposited linked panel. Condominium loan amounts come from the linked dataset [Loschi, 2026a], which rebuilds them from public ACRIS records with a documented script: 47,702 condominium purchases whose loan matches on unit lot, sale date and price.

**Consolidation agreements.** A New York purchase can be financed by a Consolidation, Extension and Modification Agreement (CEMA), under which the buyer takes an assignment of the seller’s existing mortgage and pays the recording tax only on new money. Where such agreements are used, recorded principal overstates the taxable amount. Retrieving the 29,511 M&CON documents (“MORTGAGE AND CONSOLIDATION” in the ACRIS code table) recorded since 2015 and matching them to parcels and dates, 56 of 72,830 purchases flagged cash, 0.08%, have a concurrent consolidation agreement. The consolidation screen concerns financing classification and does not bound the adjustment from recorded principal to taxable new money among purchases already classified as financed.

**Costing a notch-free change.** Three statutory changes would narrow the difference in liability between a financed and a cash purchase: exempting owner-occupied residential purchase money

**Table A13:** Gross schedule-implied borrower charge on observed loans, before credits, exemptions and CEMA adjustments

|                     | Loans with an<br>observed amount | Mean<br>LTV | Median<br>LTV | MRT as a share of price |        |       |       |
|---------------------|----------------------------------|-------------|---------------|-------------------------|--------|-------|-------|
|                     |                                  |             |               | Mean                    | Median | p10   | p90   |
| <b>Houses</b>       | 125,023                          | 0.745       | 0.774         | <b>1.41%</b>            | 1.44%  | 0.91% | 1.86% |
| <b>Condominiums</b> | 47,702                           | 0.678       | 0.737         | <b>1.28%</b>            | 1.37%  | 0.78% | 1.60% |

*Notes.* The borrower’s schedule, 1.80% below \$500,000 and 1.925% at or above, is applied to each loan at its own size rather than at a representative loan-to-value ratio, and expressed as a share of the recorded purchase price. The lower condominium benchmark accompanies a lower mean recorded loan-to-price ratio. Why loan amounts or financing choices differ is a separate question. A cash buyer pays none of it in either market, and a co-operative buyer pays none of it at all, since a share loan is personalty and outside Article 11. The schedule is applied to recorded principal. The calculation does not establish taxable new money and applies no credits or exemptions, such as the exclusion of the first \$10,000 of one- and two-family mortgages from the 0.30% component or the credit on first sales of condominium units [New York City Department of Finance, 2025].

from Article 11; imposing an equivalent charge on purchases that record no mortgage; or reassigning the borrower-borne components to the lender, as §253(1-a) already does for the special additional tax. Their economic incidence is not estimated here. The first forgoes revenue, including the §253(2) component that Tax Law §261 directs to the Metropolitan Transportation Authority, so it needs a replacement. The costing below covers all observed house and condominium purchases, because owner occupancy is not identified.

Summing the schedule over every financed purchase in the linked panel, each observed loan at its own size, gives **\$244 million a year** of gross schedule-implied borrower charge on residential purchase money in the four ACRIS boroughs between \$300,000 and \$6,000,000, of which \$38.5 million is the MTA-dedicated §253(2) component (Table A14). Of the total, \$240.2 million rests on observed loan amounts and \$4.1 million on imputed ones, for the 3,470 houses and 370 condominiums without a usable loan amount. This is a bottom-up figure for the population the paper observes, before credits, exemptions and consolidation adjustments, and it should not be read as net revenue forgone.

The Department of Finance publishes a benchmark. Its total mortgage-recording-tax liability on residential mortgages, which covers purchase and refinance loans in all five boroughs and includes the lender-paid special additional tax, averaged \$541 million a year over 2016–2024 [New York City Department of Finance, 2025, Table 10]. Put on the same all-levies basis, the panel’s purchase-money charge averages \$277 million a year over those years, 51% of the city’s figure and between 44% and 60% in each year. The remainder is refinancing, Staten Island, purchases outside the panel’s price range or without a matched loan, and exemptions, which the panel’s gross basis does not apply.

Because notches move transactions (Section 4 of the paper), the illustrative replacements are continuous schedules paid by every house and condominium buyer regardless of payment method. Raising the same \$244 million from the same purchases takes 0.88% of the whole price; 1.56% of the price above \$500,000; or 1.31% between \$500,000 and \$2,000,000 and twice that above (Supplemental Appendix Table A5). Each is continuous in price. The marginal rate changes at a breakpoint, but total liability never jumps. Between 90% and 91% of financed buyers would pay less, by about \$5,000 on average, and cash buyers about \$11,000 to \$13,000 more. Keyed on property class, the flat rate would be 1.02% for houses and 0.68% for condominiums. These figures hold transactions fixed and assign statutory incidence, so they measure the size of the swap and do not forecast its revenue.

**Table A14:** The gross schedule-implied charge on residential purchase money

| <i>Gross schedule-implied borrower charge on purchase money, \$ million a year</i> |              |
|------------------------------------------------------------------------------------|--------------|
| Houses, loan amount observed (125,023 loans)                                       | 161.2        |
| Houses, loan amount imputed (3,470)                                                | 3.4          |
| Condominiums, loan amount observed (47,702 loans)                                  | 79.0         |
| Condominiums, loan amount imputed (370)                                            | 0.7          |
| <b>Total</b>                                                                       | <b>244.3</b> |
| of which the §253(2) MTA component                                                 | 38.5         |
| Total on observed loan amounts only                                                | 240.2        |

*Notes.* Merged house and condominium panel: 249,395 purchases between \$300,000 and \$6,000,000 in the four boroughs ACRIS covers, of which 176,565 financed. Staten Island sales, whose deeds and mortgages ACRIS does not record, are excluded. The charge is the borrower-side schedule applied to each observed loan's recorded principal (1.80% below \$500,000, 1.925% at or above), before credits, exemptions and consolidation (CEMA) adjustments, so the totals are a fixed-sample gross benchmark, not net revenue. Condominium loan amounts come from the linked dataset [Loschi, 2026a], matched to the panel on unit lot, sale date and price; sales whose unit, date and price match more than one record are left to imputation. Financed purchases without a usable loan amount carry the observed mean for their property type and price band. Replication package, `revenue_neutral.py`; the comparison with the Department of Finance in the text is from `benchmarks_v29.py`.

## J. Checking the one-row-per-deed rule

This section supports Sections 3.1 and 4.6 of the paper. The sales file lists a deed that conveys several lots once per lot, each row carrying the whole consideration, and the paper keeps one row per sale date, borough, tax block and price. Table A15 classifies every row that rule removes within 10% of the four thresholds. Near the three new thresholds almost all removed rows are one deed, repeated rows for one unit, or co-operative apartments sold together at a bulk price. At the \$1,000,000 control, many are separate sales of identical units on the same day, so the paper’s every-row estimates are the relevant check there.

**Table A15:** What the one-row-per-deed rule removes near the thresholds

| Removed rows belong to                | Rows removed within 10% of |        |        |        | In $(X, 1.05X)$ , post-reform |      |
|---------------------------------------|----------------------------|--------|--------|--------|-------------------------------|------|
|                                       | \$1M                       | \$2M   | \$3M   | \$5M   | \$3M                          | \$5M |
| All lots on one recorded deed (ACRIS) | 70                         | 151    | 189    | 227    | 32                            | 55   |
| Repeated rows for one unit            | 33                         | 55     | 66     | 157    | 41                            | 47   |
| Co-op apartments, bulk price          | 50                         | 139    | 110    | 137    | 29                            | 32   |
| Separate recorded deeds               | 151                        | 31     | 16     | 4      | 0                             | 0    |
| Co-op apartments, unit price          | 47                         | 37     | 11     | 3      | 0                             | 0    |
| No deed found in ACRIS                | 31                         | 7      | 14     | 0      | 0                             | 0    |
| All                                   | 382                        | 420    | 406    | 528    | 102                           | 134  |
| Removed a year, before / after        | 21 / 45                    | 7 / 54 | 3 / 60 | 3 / 81 |                               |      |

*Notes.* Rows of the sales file removed by the rule of Section 3.1 of the paper (one row per sale date, borough, tax block and price) in groups priced within 10% of each threshold, all periods. Groups whose rows carry different lots are checked against ACRIS: all lots listed on one deed dated within 30 days of the sale date, or on separate deeds. Groups on one lot are repeated rows for one unit when the address or apartment is the same. Otherwise they are co-operative apartments in one building, whose share sales ACRIS does not record, and are classed as a bulk price when the price is at least twice the median of the building’s other, unrepeated sales. Staten Island groups on several lots are among those with no deed found, because ACRIS does not cover the borough. Replication package, `deed_merge_check.py`, from `data/acris_merge_check.json`.

## K. Replication manifest

**Retrieval.** `fetch_annualized.py` obtains the Department of Finance sales file; `fetch_acris.py` and `fetch_legals2.py` obtain the ACRIS master and legals tables. The legals table carries no date column, but its `document_id` begins with the four-digit recording year, which is what makes it pageable by period; cursor paging on `document_id` rather than offset paging is necessary because the table has 22.7 million rows.

**Linkage.** `build_panel.py` constructs the house panel and the financing flags. `condo_match.py` recovers condominium unit lots via each sale’s own deed and reports the validation on houses. `merge_rerun.py` combines the two into the four-borough, loan-amount-linked panel of Section I. Co-operatives are outside the recording tax and contribute nothing to it, and the notch analysis needs prices and dates from the full sales file but no financing flag.

**One row per deed.** `fetch_full_price_range.py` re-retrieves the sales file with no upper price limit, paging on the stable row identifier and asserting the total against a server-side count; `build_deed_groups.py` reads that extract, checks that its date–price records are the deposited ones, and writes `data/deed_groups.csv.gz`, the groups of rows that share a sale date, borough, tax block and price. `deeds.py` keeps one row per deed in every script; setting `SHAPE_ALL_ROWS=1` keeps every row.

**Fixed window and charm counts.** `prepost.py`, `diffbunch.py`, `robust.py` and `verify.py` produce Tables A1, A10 and A11 on every row; `notch_by_financing.py` produces Table A2; `focal_table.py` produces Table 1 of the paper.

**The full 2019 schedule.** `threshold_extension.py` produces Table 5 of the paper and Table A3 (seed 20260923); `equality_test.py` the joint bootstrap tests of Section 4.5 (seed 20260924); `build_v11_exhibits.py` and `build_supp_v11.py` render Table 5, Figure 3 of the paper and Section C; `collapsed_counts.py` compares the Table A3 counts on one row per deed and on every row, and `deed_merge_check.py` produces Table A15.

**Placebos, timing and markets.** `placebo_inference.py` produces Table 6 of the paper and Table A6 (seed 20260926); every placebo window is resampled with replacement when it is matched to a treated threshold’s sample size. `event_study.py` produces Figure 4 of the paper (seed 20260927). `build_linked_fields.py` attaches property type, borough, deed classification, company flags and year built from the linked dataset to the same sales, asserting that their date–price records are identical, and writes the matched condominium loans. `market_splits.py` and `cost_and_sponsors.py` (seed 20260929) produce Table 8 of the paper, the counts behind Table 10, and Tables A7, A8 and A9; `build_v15_exhibits.py` and `build_v24_exhibits.py` render them. `ltv_charm.py` produces the loan-to-value test of Section G and Table A4.

**The round price, the model, widths and cost.** `focal_robustness.py` (seed 20261013) produces the price-zone counts of Table 2 of the paper, Table 7 (estimates without the round-price sales, net of the control, among houses, on every row and with alternative round-number indicators) and Table 9 (widths). `focal_inference.py` (seed 20261013) produces Table 3 (the difference-in-differences, its permutation over placebos and its year-by-year version), the moved shares of Table 2, Panel A of Table 4, the avoided-tax variants of Table 10 and the loan-sizing check of Section 4.8; `make_did_figure.py` draws Figure 2, and `moved_share_checks.py` (seed 20261014) Panels B and C of Table 4, and `did_round_placebos.py` (seed 20261015) Panel B of Table 3. `notch_elasticity.py` and `km_unraveling.py` supply the elasticities and the Kopczuk–Munroe counterfactual. `benchmarks_v29.py` produces the revenue and slice schedules of Table 11 and the Department of Finance comparison of Section I; `volume_shares.py` the volume

comparison; `make_headline_figure.py` Figure 1; and `build_v29_exhibits.py` renders Tables 2, 3, 4, 7, 9, 10 and 11.

**Loans and the recording tax.** `loan_notch.py`, `loan_notch_grid.py` and `loan_notch_checks.py` produce the loan-notch estimates of Section 5 of the paper, their specification grid, the year-by-year and price checks and the comparison with other round loan amounts. `revenue_neutral.py` produces Tables A13 and A14, the replacement schedules and Table A5; `compute_ltv.py` reproduces the house row of Table A13; `verify3.py` documents the consolidation screen and `fetch_cema.py` retrieves the consolidation agreements it uses.

**Equal periods.** `5_transaction_accounting/transaction_accounting.py` produces Table A12 and the composition and missingness detail.

**Checks.** `check_text_against_outputs.py` confirms every number the paper and this appendix quote against the outputs, and `1_verify/verify_manuscript_numbers.py` audits the derived arithmetic.

Seeds are 20260903 for Table A10, 20260923 for Table 5 and Table A3, 20260924 for the joint tests of Section 4.5, 20260926 and 20260927 for the placebo draws, 20260929 for the cost and company-seller bootstraps, and 20261013 for the round-price analysis and 20261014 for the moved-share checks of Table 4 and 20261015 for Panel B of Table 3. Every table reproduces from these scripts and the public endpoints named above.

## References

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- New York State. New York Tax Law §§ 253, 253-a, 1402, 1402-a, 1402-b, 1404; New York City Administrative Code §§ 11-2101 to 11-2117. Consolidated Laws of New York, Chapter 60, Articles 11 and 31; Real Property Transfer Tax, 2026. §1402-b added by L.2019, c.59, pt. D, effective 1 July 2019, with conveyances under binding contracts entered into on or before 1 April 2019 excluded.