# Robustness Tests

This appendix provides several robustness tests to my analysis. Firstly, in the main body of the essay, in the analysis of the clearing mandate on swap pricing, I filtered out observations that were +/- 50 bps from the Bloomberg terminal calculated fair rate. I now present an alternate version of tables Table 8 and Table 9, now including these outliers. Overall, there were 1,101 such outliers (representing about 4% of the overall dataset). Results continue to be very similar to the results found in the main essay. In this broader dataset, clearing causes a 12-bps rise in swaps prices for USD contracts in the overall dataset. Most control variables also show similar results to what is found in the main essay. The notable exceptions are tenor (where a one-year increase in the tenor is now associated with a 0.03 bps increase in the premium instead of a 4-bps decrease) and Friday trading (which is now associated with a 0.95 bps increase in the premium rather than a -0.78-bps decrease). The group difference (that is the difference in baseline premium for USD over CAD contracts) also becomes not statistically significant. Note that the effect of these control variables is small (less than 1 bps).

Table Diff-in-diff results after including all pricing outliers

|  |  |  |
| --- | --- | --- |
| **Diff-in-diff Regression Results** | | |
|  | | |
|  | Dependent variable: Premium | |
|  |  | |
|  | Basic Model | Advanced Model |
|  | (1) | (2) |
|  | | |
| Group | 6.4783\*\*\* | 7.1186\*\*\* |
|  | (1.2754) | (1.2786) |
| Period | -16.8364\*\*\* | -16.6251\*\*\* |
|  | (1.6893) | (1.6921) |
| Tenor |  | -0.0552\*\* |
|  |  | (0.0226) |
| Log Notional |  | 0.5606\*\*\* |
|  |  | (0.1730) |
| Capped |  | -0.3432 |
|  |  | (0.4880) |
| SEF |  | -4.2437 |
|  |  | (6.5996) |
| Morning Session |  | -2.6170\*\*\* |
|  |  | (0.4843) |
| Afternoon Session |  | -2.4587\*\*\* |
|  |  | (0.4762) |
| Off Hours |  | -3.5615\*\*\* |
|  |  | (0.5589) |
| Monday |  | 2.8288\*\*\* |
|  |  | (0.5910) |
| Tuesday |  | 1.6594\*\*\* |
|  |  | (0.5454) |
| Thursday |  | 1.1212\*\* |
|  |  | (0.5274) |
| Friday |  | -0.7841 |
|  |  | (0.5581) |
| Group \* Period | 12.8246\*\*\* | 12.1513\*\*\* |
|  | (1.7395) | (1.7539) |
| Constant | -3.4148\*\*\* | -11.6213\*\*\* |
|  | (1.2252) | (3.1911) |
|  | | |
| Observations | 28,311 | 28,311 |
| R2 | 0.0139 | 0.0182 |
| Adjusted R2 | 0.0138 | 0.0177 |
| Residual Std. Error | 30.2838 (df = 28307) | 30.2239 (df = 28296) |
| F Statistic | 133.0846\*\*\* (df = 3; 28307) | 37.4453\*\*\* (df = 14; 28296) |
|  | | |
| Note: | \*p\*\*p\*\*\*p<0.01 | |

Table Difference-in-differnces results after including pricing outliers. By phase analysis.

|  |  |  |  |
| --- | --- | --- | --- |
| **By Phase Results: Advanced Model** | | | |
|  | | | |
|  | Dependent variable: Premium | | |
|  |  | | |
|  | Phase 1 | Phase 2 | Phase 3 |
|  | (1) | (2) | (3) |
|  | | | |
| Group | 7.200\*\*\* | 6.368\*\*\* | 12.806\*\*\* |
|  | (2.241) | (2.151) | (2.331) |
|  |  |  |  |
| Period | -2.813 | -16.738\*\*\* | -5.274\*\* |
|  | (3.751) | (2.926) | (2.617) |
|  |  |  |  |
| Tenor | -0.305\*\*\* | 0.021 | 0.039 |
|  | (0.055) | (0.031) | (0.035) |
|  |  |  |  |
| Notional | -2.382\*\*\* | 0.653\*\* | 2.108\*\*\* |
|  | (0.391) | (0.257) | (0.257) |
|  |  |  |  |
| Capped | 1.164 | 0.031 | -1.834\*\* |
|  | (1.141) | (0.689) | (0.729) |
|  |  |  |  |
| Morning Session | -5.318\*\*\* | 0.581 | -2.231\*\*\* |
|  | (1.121) | (0.702) | (0.716) |
|  |  |  |  |
| Afternoon Session | -3.678\*\*\* | -1.300\* | -0.882 |
|  | (1.110) | (0.673) | (0.718) |
|  |  |  |  |
| Off Hours | -6.020\*\*\* | 0.474 | -6.191\*\*\* |
|  | (1.311) | (0.803) | (0.826) |
|  |  |  |  |
| Monday | -0.927 | 9.518\*\*\* | -4.437\*\*\* |
|  | (1.361) | (0.883) | (0.866) |
|  |  |  |  |
| Tuesday | -2.788\*\* | 8.744\*\*\* | -3.307\*\*\* |
|  | (1.315) | (0.787) | (0.794) |
|  |  |  |  |
| Thursday | -2.880\*\* | 9.627\*\*\* | -5.501\*\*\* |
|  | (1.292) | (0.736) | (0.790) |
|  |  |  |  |
| Friday | -2.307\* | 4.595\*\*\* | -4.177\*\*\* |
|  | (1.373) | (0.768) | (0.848) |
|  |  |  |  |
| Group \* Period | -3.568 | 11.873\*\*\* | 11.274\*\*\* |
|  | (3.848) | (3.007) | (2.755) |
|  |  |  |  |
| Constant | 50.354\*\*\* | -21.877\*\*\* | -50.813\*\*\* |
|  | (6.877) | (4.958) | (4.895) |
|  |  |  |  |
|  | | | |
| Observations | 7,819 | 11,233 | 9,259 |
| R2 | 0.025 | 0.036 | 0.073 |
| Adjusted R2 | 0.023 | 0.035 | 0.071 |
| Residual Std. Error | 37.150 (df = 7805) | 26.916 (df = 11219) | 25.619 (df = 9245) |
| F Statistic | 15.137\*\*\* (df = 13; 7805) | 32.443\*\*\* (df = 13; 11219) | 55.763\*\*\* (df = 13; 9245) |
|  | | | |
| Note: | \*p\*\*p\*\*\*p<0.01 | | |

Also, as is sometimes done in literature, I drop observations on the first trading day of each phase that the clearing mandate went into force (to mitigate the effects of program implementation effects). Results continue to show similar patterns as found in the main body of the essay. The mandate causes a 12-bps rise in premiums for US-contracts after implementation. Control variables show similar signs and magnitude as is discussed in the main body of the paper.

Table Diff-in-diff results excluding the first day the treatment went into effect

|  |  |  |
| --- | --- | --- |
| **Diff-in-diff Regression Results** | | |
|  | | |
|  | Dependent variable: Premium | |
|  |  | |
|  | Basic Model | Advanced Model |
|  | (1) | (2) |
|  | | |
| Group | -0.8889\* | -0.7596 |
|  | (0.4942) | (0.4928) |
| Period | -11.4254\*\*\* | -11.1961\*\*\* |
|  | (0.7048) | (0.7007) |
| Tenor |  | 0.0305\*\*\* |
|  |  | (0.0089) |
| Log Notional |  | 0.6367\*\*\* |
|  |  | (0.0693) |
| Capped |  | -0.7166\*\*\* |
|  |  | (0.1920) |
| SEF |  | 0.4531 |
|  |  | (2.5989) |
| Morning Session |  | -0.9881\*\*\* |
|  |  | (0.1916) |
| Afternoon Session |  | -1.1930\*\*\* |
|  |  | (0.1877) |
| Off Hours |  | -1.2874\*\*\* |
|  |  | (0.2193) |
| Monday |  | 2.6462\*\*\* |
|  |  | (0.2662) |
| Tuesday |  | 2.3934\*\*\* |
|  |  | (0.2081) |
| Thursday |  | 2.7678\*\*\* |
|  |  | (0.2016) |
| Friday |  | 0.9347\*\*\* |
|  |  | (0.2137) |
| Group \* Period | 12.0888\*\*\* | 11.5072\*\*\* |
|  | (0.7234) | (0.7226) |
| Constant | -0.2415 | -11.9859\*\*\* |
|  | (0.4742) | (1.2767) |
|  | | |
| Observations | 25,613 | 25,613 |
| R2 | 0.0175 | 0.0335 |
| Adjusted R2 | 0.0174 | 0.0330 |
| Residual Std. Error | 11.4106 (df = 25609) | 11.3196 (df = 25598) |
| F Statistic | 152.0776\*\*\* (df = 3; 25609) | 63.4120\*\*\* (df = 14; 25598) |
|  | | |
| Note: | \*p\*\*p\*\*\*p<0.01 | |

Finally, given the low values of some of the regression results, I try alternative regression specifications. Table 20 shows the results of a model with second-order terms for the continuous control variables tenor and notional. Although these higher order terms are statistically significant, the model still suffers from the same low as the model used in the main body of the essay. The overall conclusion remains the same (clearing causes a 13-bps increase in premium for USD contracts). Control variables also show similar signs and magnitudes as in the main body of the essay.

Table Diff-in-diff with alternative model specifications

|  |  |
| --- | --- |
| **Diff-in-diff Regression Results** | |
|  | |
|  | Dependent variable: Premium |
|  |  |
|  | Advanced Model |
|  | |
| Group | -0.6567 |
|  | (0.4897) |
| Period | -13.3189\*\*\* |
|  | (0.6611) |
| Tenure2 | 0.0007\*\*\* |
|  | (0.0003) |
| (Ln notional)2 | 0.0235\*\*\* |
|  | (0.0021) |
| Capped | -1.0574\*\*\* |
|  | (0.1883) |
| SEF | 0.7100 |
|  | (2.5202) |
| Morning | -1.0268\*\*\* |
|  | (0.1843) |
| Afternoon | -1.2300\*\*\* |
|  | (0.1814) |
| Off Hours | -1.3042\*\*\* |
|  | (0.2125) |
| Monday | 1.5552\*\*\* |
|  | (0.2245) |
| Tuesday | 2.3847\*\*\* |
|  | (0.2071) |
| Thursday | 2.7650\*\*\* |
|  | (0.2006) |
| Friday | 0.9402\*\*\* |
|  | (0.2125) |
| Group \* Period | 13.4560\*\*\* |
|  | (0.6840) |
| Constant | -7.6601\*\*\* |
|  | (0.7760) |
|  | |
| Observations | 27,210 |
| R2 | 0.0441 |
| Adjusted R2 | 0.0436 |
| Residual Std. Error | 11.2629 (df = 27195) |
| F Statistic | 89.5578\*\*\* (df = 14; 27195) |
|  | |
| Note: | \*p\*\*p\*\*\*p<0.01 |