

The Effects of Global Leniency Programs on Markups and Mergers

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Internet Appendix

I. Alternative Definitions of Merger Activity

One potential issue with our results is related to the fact that our identification of merger activity relies on the match between the SDC Platinum database and the Compustat Global and North America datasets. However, SDC Platinum may not have captured all merger cases and the match between the two data sources, especially for international firms, may not be perfect. To address this issue, we report the results of a specification in which we only rely on the Compustat Global and North America datasets and focus on investment defined as the firm's change in property, plant and equipment, and goodwill, adjusted for depreciation and amortization and scaled by one-year-lagged asset size. This measure thus includes both capital expenditures and mergers.

We report the results in Table IA1. In Column (1), we find that investment of affected firms increases by 2.8%. The result is robust to controlling for firm and country characteristics (Column (2)) and industry*year fixed effects (Column (3)).

In addition, we deconstruct the total dollar value of acquisitions over the year, scaled by lagged assets, that we use as our main merger activity variable throughout the paper by only taking into account acquisitions where target and acquirer come from the same three-digit SIC industry and are headquartered in the same country. We indeed find that the passage of leniency laws increases the within-country acquisitions of competitors. In Table IA1, Column (4), we provide the specification without the controls; in Column (5) we control for firm and country characteristics, and in Column (6) for industry*year fixed effects.

II. Standard Errors

We explore the sensitivity of our estimates' statistical significance when we cluster our standard errors in a different way. In Table IA2, we report the estimates for gross profitability margin in Columns (1)-(4)

and for merger activity in Columns (5)-(8). While in our baseline specifications we cluster them at the country level, in Table IA2 we report that the statistical significance is consistent if we cluster them by industry*country (Columns (1) and (3)), double-cluster by country and year (Columns (2) and (4)), double-cluster by industry and year (Columns (3) and (5)), or double-cluster by country and industry (Columns (4) and (6)). The estimates remain statistically significant at conventional levels.

Moreover, as pointed out by Bertrand, Duflo, and Mullainathan (2004), within our context, it may not be possible to properly account for the correct structure of the error covariance matrix simply by clustering the standard errors. Thus, we provide a test in which we randomize the assignment of leniency law years.

In particular, we assign a random year for the passage of leniency laws in each country. We repeat this procedure 5,000 times to obtain 5,000 randomized leniency law samples. In each of these randomized leniency law samples, we run our baseline regressions as in Table 5, Panel A, Column (1), and Table 6, Panel A, Column (1), and save the relevant coefficients. Finally, we compare the coefficients from identification using our actual leniency laws with those obtained from identification using these pseudo leniency laws.

We report the distribution of the coefficients in Figure IA1. The first figure presents the coefficients in cartel detection regressions as in Table 5, Panel A, Column (1), and the second figure reports the coefficients in merger regressions as in Table 6, Panel A, Column (1). The figures demonstrate that our actual coefficients are larger in 4,819 of 5,000 (96.4%) randomized samples in the case of the effect on profitability, and are smaller in 4,880 of 5,000 (97.8%) randomized samples in the case of the effect on merger activity. The non-parametric nature of this analysis suggests that the specification of the error covariance matrix does not affect our results.

References

Bertrand, M., E. Duflo, and S. Mullainathan, 2004, How Much Should We Trust Differences-in-Differences Estimates?, *Quarterly Journal of Economics* 119, 249-275.

Table IA1. Robustness to definitions of merger activity

We consider all Compustat Global and North America firms over 1990-2012. This table reports the OLS regressions, where the dependent variable in Columns (1)-(3) is the change in the value of tangible and intangible assets, adjusted for depreciation, scaled by last year's assets and winsorized at 1%, and in Columns (4)-(6) is the total dollar value of acquisitions in the same industry (three-digit SIC) and located in the same country over the year, scaled by lagged assets and winsorized at 1%. All of the regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country level.

Our main variable of interest is the leniency law dummy. In Columns (1) and (4), we test the effect without any additional controls. In Columns (2) and (5), we control for firm and country characteristics: assets, leverage, GDP per capita, unemployment, and imports as % of GDP. In Columns (3) and (6), we control for industry (three-digit SIC)*year fixed effects. We report t-statistics in the brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Leniency law	0.028** (2.615)	0.031*** (2.825)	0.022** (2.473)	0.003*** (3.426)	0.003*** (3.278)	0.003*** (3.321)
Controls	N	Y	Y	N	Y	Y
Firm f.e.	Y	Y	Y	Y	Y	Y
Year f.e.	Y	Y	N	Y	Y	N
Industry*year f.e.	N	N	Y	N	N	Y
R-squared	0.148	0.176	0.193	0.063	0.07	0.068
N	394,246	336,104	335,975	541,869	432,447	432,330

* p<0.10, ** p<0.05, *** p<0.01

Table IA2. Robustness to estimation of standard errors

We consider all Compustat Global and North America firms over 1990-2012. This table reports the OLS regressions, where the dependent variable in Columns (1)-(4) is the gross margin, winsorized at the 1% level, and in Columns (5)-(8) is the total dollar value of mergers and acquisitions over the year, scaled by lagged assets and winsorized at 1%. All of the regressions include firm fixed effects and industry*time fixed effects. Standard errors are clustered at the country level.

Our main variable of interest is the leniency law dummy. In Columns (1) and (5), we cluster standard errors by industry*country. In Columns (2) and (6), we double-cluster standard errors by country and year. In Columns (3) and (7), we double-cluster standard errors by industry and year. In Columns (4) and (8), we double-cluster standard errors by industry and year. We report t-statistics in the brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Leniency law	-0.050*** (-7.647)	-0.050** (-2.344)	-0.050*** (-3.846)	-0.050** (-2.451)	0.016*** (8.158)	0.016*** (3.516)	0.016*** (5.074)	0.016*** (3.715)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Industry*year f.e.	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.525	0.525	0.524	0.524	0.084	0.084	0.084	0.084
N	401,461	401,461	401,461	401,461	432,330	432,330	432,330	432,330

* p<0.10, ** p<0.05, *** p<0.01

Figure IA1. Simulated distributions of leniency laws

We plot the distributions of the coefficients of the regressions based on the randomized passage of leniency laws. We randomize the passage of laws in 63 countries 5000 times. The first figure presents the coefficients on profitability as in Table 5, Panel A, Column (1). The second figure reports the coefficients on mergers as in Table 6, Panel A, Column (1). Vertical lines indicate the coefficient from the actual regression.

