Internet Appendix

Competition shocks, rival reactions, and stock return comovement

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Contents

Summary

In this internet appendix, we start by reporting descriptive statistics on return comovement. Figure IA.1 displays the distribution of the annual bi-firm idiosyncratic return correlations, as defined in equation (1) in the main text. As shown, the distribution is centered around zero and well-behaved. This confirms that the return generating process used to obtain idiosyncratic returns (the Fama and French (2015) five risk factors, complemented with the 3-digit SIC industry index) captures the priced risk factors.

Table IA.1 tabulates the corresponding distribution moments (mean, median, standard deviation, skewness, kurtosis), successively adding factors to the return generating process. The importance of extracting the Fama and French (2015) five risk factors and the 3-digit SIC industry index from the raw returns to obtain idiosyncratic returns is again clearly apparent. In Table IA.1 Column (6), we also report the average R2 of the return generating process firm-year regressions. Our six factors model explain close to 18% of the daily return variance over the 1970-2010 period for our sample of Compustat-CRSP manufacturing firms.

Next, we report five different robustness tests of the significance of the treatment effect of the tariff cuts reported in Table 5 in the main text. The first test progressively saturates the baseline regression model with fixed effects, capturing time-varying industry-level latent factors (Table IA.2). The second test computes the treatment effect using treated firms only (Table IA.3), while the third test restricts the sample to firm ij pairs to the ones existing at least one year before the treatment (Table IA.4). The fourth test reports 4-digit SIC industry and year double clustered standard errors (Table IA.5).

In the fifth test (Table IA.6), we compute significance levels using a randomized treatment

procedure (Cunningham, 2021). This randomized treatment procedure involves obtaining p-values from random permutations of the data under the null hypothesis of no treatment effect and computing the number of times we observe (by chance) a test statistic that rejects this null. More precisely, we proceed as follows:

1. Estimate the regression on the original dataset and store the estimated test statistic of the coefficient of interest (the coefficient of $TREATED_{ij} \times POST_{ijt}$ in the present case—see equation 7 in the text).

2. Shuffle (randomly mix) the variable of interest to generate a randomized sample.

3. Estimate the regression on the randomized sample and store the randomized test statistic of the coefficient of interest.

4. Repeat steps 2 and 3 above one hundred times (a restriction reflecting the size of our dataset).

5. Compute the number of times the randomized test statistic exceeds the critical value in a two-tails test.

6. Divide the number in step 5 by one hundred (the number of randomized samples) to obtain the randomized p-value.

In the seventh and final test, we explore the relations between return comovement and business cycles. Figure IA.2 focuses on aggregate economic downturns, identified using the NBER recession indicator. The figure reports the evolution of the average idiosyncratic comovement from 1970 to 2010 (the red curve) for our Compustat-CRSP sample of manu-

facturing firms with corresponding NBER recession periods (the grey bars). Average idiosyncratic comovement peaks during aggregate recessions, especially during the 1980-1982, 2001 and 2008-2009 episodes. Note, however, that whether aggregate recessions drive increase in comovement or vice-versa is unclear as the 2000 comovement peaks clearly predates the 2001 recession.

To identify 3-digit SIC industry level recession periods, we start by computing 36 months rolling-window industry-level compound returns. A given 3-digit SIC industry month is defined to be in recession if the corresponding compound return is negative. Recession years are years containing at least one such month of recession. Stock returns are collected in the CRSP Monthly database and all ordinary shares (share codes 10 and 11) listed on the NYSE, AMEX and Nasdaq (exchange codes 1, 2 and 3) are included in the sample. 3-digit SIC industry returns are value-weighted.

Armed with this industry-level recession indicator variable, we study the effect of industry-level recessions on within industry comovement (ρ_{ijt}). Importantly, as indicated by the header of Table IA.7, this analysis is performed at the firm-pair level (the ij subscript, where i and j always belong to the same industry). Finally, to check whether our results are driven by recessions and not tariff cuts, we include both the industry recession indicator variable and the tariff cut indicator variable in our regression specifications.

The results in Table IA.7 indicate, at the 10% confidence level (see columns 1 through 4), the presence of a positive relation between within-industry comovement and industry-level downturns. As expected, this positive correlation disappears once industry fixed effects are included in the regression specification (columns 5 through 8). We note also that, across all specifications, the tariff-cut treatment effect remains positive and highly significant, con-

firming our baseline results reported in Table 5 in the main text.[26]

Table IA 1: **Annual return comovement: descriptive statistics**

The table reports characteristics of the distribution of annual idiosyncratic within-industry return correlation coefficients ρ_{ijt} between firms i and j, estimated using a minimum of 90 daily returns observations within each calendar year, as follows:

$$\rho_{ijt} \equiv \frac{COV(\epsilon_{it}, \epsilon_{jt})}{\sigma_{\epsilon_{it}} \sigma_{\epsilon_{jt}}}$$

where σ indicates standard deviation, and ϵ is the residual from the following daily return-generating factor model:

$$r_{it} = \alpha_i + \beta_{\mathbf{i}} \mathbf{F_t} + \epsilon_{it}$$

The daily return factors are $\mathbf{F} = [R_M - R_F,\ SMB,\ HML,\ RMW,\ CMA,\ I_{SIC3}]$, where $R_M - R_F$ is the excess return on the value-weighted market portfolio, SMB, HML, RMW and CMA are the returns on the Fama and French (2015) long-short size, book-to-market, profitability and investment portfolios, and the industry index I_{SIC3} is the value-weighted portfolio of all CRSP firms, excluding firm i, that are in firm i's 3-digit SIC (standard Industrial Classification) industry. Column (6) shows the average R^2 of the return generating factor model. The first row shows the descriptive statistics for the raw-return correlation coefficient ($COV(r_{it}, r_{jt})/\sigma_{r_{it}} \sigma_{r_{jt}}$) unadjusted for any risk factor exposures. Rows 2–5 successively add more risk factors: 1f ρ_{ijt} adjusts for the market portfolio only; 3f ρ_{ijt} adjusts for the first three risk factors; 5f ρ_{ijt} the first five risk factors; and 6fρ_{ijt} adjusts for all six factors. The sample period is 1970–2010 and encompasses all Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999).

Factor adjustment	Mean (1)	Median (2)	Stdev (3)	Skewness (4)	Kurtosis (5)	R^2 (6)
Raw ρ_{ijt}	-0.0108	-0.0107	0.0610	-0.0694	4.4188	
1f ρ_{ijt}	0.0146	0.0132	0.0726	0.2103	4.0516	0.1055
3f ρ_{ijt}	0.0021	0.0013	0.0694	0.1414	3.8167	0.1474
5f ρ_{ijt}	0.0020	0.0013	0.0694	0.1191	3.6854	0.1731
6f ρ_{ijt}	0.0017	0.0011	0.0687	0.0791	3.5063	0.1896

[26] Table IA.7 differs from the paper's main analysis (Table 5) in that it examines the interaction between two shocks: the tariff cut and the business cycle downturn. Our baseline model specification is more powerful as it compares firm-pairs across treated and untreated industries while Table IA.7 focuses exclusively on within-industry comovement.

Table IA 2: **Effect of tariff cuts on return comovement: adding fixed-effects structures**

The table shows coefficient estimates of the average treatment effect of tariff cuts using the following six panel regressions, estimated over the period 1970–2010:

$$
\begin{aligned}
(1)\ \rho_{ijt} &= \alpha + \beta_t + \mathbf{CONTROLS}'\mu + \delta(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(2)\ \rho_{ijt} &= \alpha_i + \beta_t + \mathbf{CONTROLS}'\mu + \delta(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(3)\ \rho_{ijt} &= \alpha + \beta_t + \gamma_{SIC3} + \mathbf{CONTROLS}'\mu + \delta(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(4)\ \rho_{ijt} &= \alpha + \gamma_{SIC3\times Year} + \mathbf{CONTROLS}'\mu + \delta(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(5)\ \rho_{ijt} &= \alpha_i + \gamma_{SIC3\times Year} + \mathbf{CONTROLS}'\mu + \delta(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(6)\ \rho_{ijt} &= \alpha_{ij} + \gamma_{SIC3\times Year} + \mathbf{CONTROLS}'\mu + \delta(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt}
\end{aligned}
$$

Equation (1) includes only year fixed-effects. Equation (2) adds firm i fixed-effects. Equation (3) drops firm i fixed-effects but add industry (3-digit SIC code level) fixed-effects. Equation (4) includes industry fixed-effects interacted with year fixed-effects. Equation (5) adds firm i fixed-effects. Equation (6) replaces firm i fixed-effects by firm ij fixed-effects. Columns (1) to (6) report corresponding results, with the fixed-effects structure describes in the bottom part of the table. Like in Table 5 in the paper, the idiosyncratic stock return comovement between firms i and j in year t, ρ_{ijt}, is estimated using equations (1) and (2) in the text. Firm i is always in a treated industry while firm j is either in a treated industry or not. The dependent variable is the signed value of the annual comovement ρ_{ijt}. $Treated_{ij}$ is an indicator variable equal to one if the firm pair ij is treated (their 4-digit SIC industry receives a significant tariff cut), while $Post_{ijt}$ is an indicator variable equal to one for the post-treated periods. **CONTROLS** is a vector of control variables identified in Table 2 as significant determinants of ρ_{ijt} ($BM, LEV, R\&D, CASH, INTG\ QUARTILE$ as well as the $LEADER$, HHI and $LOCATION$ dummy variables). The sample of firms encompasses all Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999). FEs stands for fixed-effects. F is the Fisher test statistic for the joint significance of the regression coefficients. N is the number of observations. Standard errors, clustered at the level encompassing the fixed-effects structure, are in parentheses, and *, **, *** indicate significance at the 10%, 5%, and 1% levels of confidence.

Dependent variable:	**Signed ρ_{ijt} value**					
coefficient	(1)	(2)	(3)	(4)	(5)	(6)
$AlLFIMRS$: δ	0.006***	0.005***	0.006***	0.006***	0.006***	0.003**
	(0.0004)	(0.0009)	(0.0021)	(0.0021)	(0.0008)	(0.0015)
$CONTROLS$	Yes	Yes	Yes	No	Yes	Yes
Year FEs	Yes	Yes	Yes	No	No	No
Firm FEs	No	Yes	No	No	Yes	No
Firm pair FEs	No	No	No	No	No	Yes
SIC3 FEs	No	No	Yes	No	No	No
SIC3 × Year FEs	No	No	No	Yes	Yes	Yes
R^2	0.00	0.00	0.00	0.00	0.00	0.18
F	116.12	14.79	134.01	31.56	62.49	9.68
N	14,549,529	14,549,529	14,549,529	14,549,529	14,549,526	13,870,729

Table IA 3: **Estimating the effect of tariff cuts with treated firms only**

The table shows coefficient estimates of the average treatment effect of tariff cuts using the following two regressions, with year t running from 1970–2010:

$$
\begin{aligned}
(1)\quad \rho_{ijt} &= \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu + \gamma POST_{ijt} + \epsilon_{ijt} \\
(2)\quad \rho_{ijt} &= \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu \\
&\quad +\gamma_1(POST_{ijt} \times D_{FOLLOWER_i}) + \gamma_2(POST_{ijt} \times D_{LEADER_i}) \\
&\quad +\gamma_3(POST_{ijt} \times (1 - D_{FOLLOWER_i}) \times (1 - D_{LEADER_i})) + \epsilon_{ijt}
\end{aligned}
$$

Regression (1) uses all treated firms while regression (2) splits all treated firms into industry followers and leaders, identified using a combination of market shares, cash balances, and return-on-assets. The idiosyncratic stock return comovement between firms i and j in year t, ρ_{ijt}, is estimated using Eqs. (1) and (2) in the text. Firm i is always in a treated industry while firm j is either in a treated industry or not. D_{LEADER_i} and $D_{FOLLOWER_i}$ are dummy variables that take a value of one if firm i is an industry leader or a follower, respectively, in the year prior to the year of the competition shock, and zero otherwise. Their complement is covered by the dummy $(1 - D_{FOLLOWER_i}) \times (1 - D_{LEADER_i})$. In Panel A the dependent variable is the signed value of the annual comovement ρ_{ijt}, while Panel B uses the absolute value of $(|\rho_{ijt}|)$. α_{ij} are firm-pair ij fixed-effects, β_t are year fixed-effects. $Post_{ijt}$ is an indicator variable equal to one for the post-treated periods. **CONTROLS** is a vector of control variables identified in Table 2 as significant determinants of ρ_{ijt} ($BM, LEV, R\&D, CASH, INTG\ QUARTILE$ as well as the $LEADER$, HHI and $LOCATION$ dummy variables). The sample of firms encompasses all treated Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999). Size effects, computed as the coefficient scaled by the standard error of ρ_{ijt}, are reported between square brackets. F is the Fisher test statistic for the joint significance of the regression coefficients. $\gamma_1 = \gamma_2$ reports the Fisher statistic obtained for a test of equality of coefficients and N is the number of observations. Standard errors are in parentheses, and *, **, *** indicate significance at the 10%, 5%, and 1% levels of confidence.

Dependent variable:	**A: Signed ρ_{ijt} value**			**B: Absolute ρ_{ijt} value**		
Treatment	All firms		Followers v. Leaders	All firms		Followers v. Leaders
coefficient	(1)	(2)	(3)	(1)	(2)	(3)
$ALLFIRMS$: γ	0.0032**	0.0033**		0.0034***	0.0033***	
	(0.0013)	(0.0013)		(0.0009)	(0.0009)	
	[0.039]	[0.040]		[0.0590]	[0.0581]	
$FOLLOWER$: γ_1			0.0033***			0.0008
			(0.0013)			0.0007
$LEADER$: γ_2			−0.0014*			0.0005
			(0.0008)			0.0005
$INBETWEEN$: γ_3			−0.0016			0.0024*
			(0.0019)			(0.0013)
$CONTROLS$	No	Yes	Yes	No	Yes	Yes
R^2	0.413	0.413	0.413	0.467	0.468	0.468
F	3.443	3.316	3.404	11.38	9.55	9.06
$\gamma_1 = \gamma_2$			0.00			0.72
N	189,592	189,592	189,592	189,592	189,592	189,592

Table IA 4: **Effect of tariff cuts on return comovement restricting the sample to firm ij pairs existing at least one year before the treatment**

The table shows coefficient estimates of the average treatment effect of tariff cuts using the following two panel regressions, estimated over the period 1970–2010:

$$
\begin{aligned}
(1)\ \ \rho_{ijt} &= \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu + \gamma(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(2)\ \ \rho_{ijt} &= \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu \\
&\quad + \gamma_1(TREATED_{ij} \times PSOT_{ijt} \times D_{FOLLOWER_i}) + \gamma_2(TREATED_{ij} \times POST_{ijt} \times D_{LEADER_i}) \\
&\quad + \gamma_3(TREATED_{ij} \times POST_{ijt} \times (1 - D_{FOLLOWER_i}) \times (1 - D_{LEADER_i})) + \epsilon_{ijt}
\end{aligned}
$$

Regression (1) uses all firms while regression (2) splits all firms into industry followers and leaders, identified using a combination of market shares, cash balances, and return-on-assets. Firm i is always in a treated industry while firm j is either in a treated industry or not. D_{LEADER_i} and $D_{FOLLOWER_i}$ are dummy variables that take a value of one if firm i is an industry leader or a follower, respectively, in the year prior to the year of the competition shock, and zero otherwise. Their complement is covered by the dummy $(1 - D_{FOLLOWER_i}) \times (1 - D_{LEADER_i})$. The dependent variable is the signed value of the annual comovement ρ_{ijt}. α_{ij} are firm-pair ij fixed-effects, β_t are year fixed-effects. $TREATED_{ij}$ is an indicator variable equal to one if the firm pair ij is treated (their 4-digit SIC industry receives a significant tariff cut), while $POST_{ijt}$ is an indicator variable equal to one for the post-treated periods. **CONTROLS** is a vector of control variables identified in Table 2 as significant determinants of ρ_{ijt} ($BM, LEV, R\&D, CASH, INTG\ QUARTILE$ as well as the $LEADER$, HHI and $LOCATION$ dummy variables). The sample of firms encompasses all Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999). The sample is restricted to firm ij pairs that exist at least one year before the treatment year. Size effects, computed as the coefficient scaled by the standard error of ρ_{ijt}, are reported between square brackets. F is the Fisher test statistic for the joint significance of the regression coefficients. $\gamma_1 = \gamma_2$ reports the Fisher statistic obtained for a test of equality of coefficients and N is the number of observations. Standard errors are in parentheses, and *, **, *** indicate significance at the 10%, 5%, and 1% levels of confidence.

Dependent variable:	**Signed return comovement** ρ_{ijt}		
			Followers v.
Treatment	All firms		Leaders
coefficient	(1)	(2)	(3)
$ALLFIRMS$: γ	0.0026**	0.0026**	
	(0.0011)	(0.0011)	
	[0.0380]	[0.0378]	
$FOLLOWER$: γ_1			0.0056***
			(0.0012)
$LEADER$: γ_2			−0.0045***
			(0.0014)
$INBETWEEN$: γ_3			−0.0026
			(0.0027)
$CONTROLS$	No	Yes	Yes
R^2	0.171	0.171	0.171
F	23.27	20.28	19.89
$\gamma_1 = \gamma_2$			0.00
N	7,108,553	7,108,553	7,108,553

Table IA 5: **Effect of tariff cuts on return comovement with 4-digit SIC industry and year double clustered standard errors**

The table shows coefficient estimates of the average treatment effect of tariff cuts using the following two panel regressions, estimated over the period 1970–2010:

$$
\begin{aligned}
(1)\ \rho_{ijt} &= \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu + \gamma(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt} \\
(2)\ \rho_{ijt} &= \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu \\
&\quad + \gamma_1(TREATED_{ij} \times POST_{ijt} \times D_{FOLLOWER_i}) + \gamma_2(TREATED_{ij} \times POST_{ijt} \times D_{LEADER_i}) \\
&\quad + \gamma_3(TREATED_{ij} \times POST_{ijt} \times (1 - D_{FOLLOWER_i}) \times (1 - D_{LEADER_i})) + \epsilon_{ijt}
\end{aligned}
$$

Regression (1) uses all firms while regression (2) splits all firms into industry followers and leaders, identified using a combination of market shares, cash balances, and return-on-assets. Firm i is always in a treated industry while firm j is either in a treated industry or not. D_{LEADER_i} and $D_{FOLLOWER_i}$ are dummy variables that take a value of one if firm i is an industry leader or a follower, respectively, in the year prior to the year of the competition shock, and zero otherwise. Their complement is covered by the dummy $(1 - D_{FOLLOWER_i}) \times (1 - D_{LEADER_i})$. The dependent variable is the signed value of the annual comovement ρ_{ijt}. α_{ij} are firm-pair ij fixed-effects, β_t are year fixed-effects. $TREATED_{ij}$ is an indicator variable equal to one if the firm pair ij is treated (their 4-digit SIC industry receives a significant tariff cut), while $POST_{ijt}$ is an indicator variable equal to one for the post-treated periods. **CONTROLS** is a vector of control variables identified in Table 2 as significant determinants of ρ_{ijt} ($BM, LEV, R\&D, CASH, INTG\ QUARTILE$ as well as the $LEADER$, HHI and $LOCATION$ dummy variables). The sample of firms encompasses all Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999). Size effects, computed as the coefficient scaled by the standard error of ρ_{ijt}, are reported between square brackets. Standard errors are double clustered at the 4-digit SIC industry and year levels. F is the Fisher test statistic for the joint significance of the regression coefficients. $\gamma_1 = \gamma_2$ reports the Fisher statistic obtained for a test of equality of coefficients and N is the number of observations. Standard errors are in parentheses, and *, **, *** indicate significance at the 10%, 5%, and 1% levels of confidence.

Dependent variable:	**Signed return comovement** ρ_{ijt}		
			Followers v.
Treatment	All firms		Leaders
coefficient	(1)	(2)	(3)
$ALLFIRMS$: γ	0.0026*	0.0026*	
	(0.0015)	(0.0015)	
	[0.0386]	[0.0384]	
$FOLLOWER$: γ_1			0.0033**
			(0.0013)
$LEADER$: γ_2			−0.0014*
			(0.0008)
$INBETWEEN$: γ_3			−0.0011
			(0.0023)
$CONTROLS$	No	Yes	Yes
R^2	0.182	0.182	0.182
F	3.113	9.413	8.408
$\gamma_1 = \gamma_2$			0.00
N	13,870,729	13,870,729	13,870,729

Table IA 6: **Significance levels with randomized treatment**

The table shows coefficient estimates of the average treatment effect of tariff cuts using the following panel data regression, estimated over the period 1970–2010:

$$\rho_{ijt} = \alpha_{ij} + \beta_t + \mathbf{CONTROLS}'\mu + \gamma(TREATED_{ij} \times POST_{ijt}) + \epsilon_{ijt}, \quad t = 1970, .., 2010$$

The dependent variable is the signed value of the annual comovement ρ_{ijt}. α_{ij} are firm-pair ij fixed-effects, β_t are year fixed-effects. $TREATED_{ij}$ is an indicator variable equal to one if the firm pair ij is treated (their 4-digit SIC industry receives a significant tariff cut), while $POST_{ijt}$ is an indicator variable equal to one for the post-treated periods. **CONTROLS** is a vector of control variables identified in Table 2 as significant determinants of ρ_{ijt} ($BM, LEV, R\&D, CASH, INTG\ QUARTILE$ as well as the $LEADER$, HHI and $LOCATION$ dummy variables). The sample of firms encompasses all Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999). F is the Fisher test statistic for the joint significance of the regression coefficients. The p-values reported in parentheses are obtained using the following procedure, repeated 100 times: re-estimate γ after randomly shuffling the interaction variable $TREATED_{ij} \times POST_{ijt}$. The p-value, reported between parentheses, is then the number of times the absolute value of the estimated γ based on the randomized sample exceeds in absolute value the γ coefficient obtained on the original sample, divided by 100 (the number of randomized samples). Standard errors are in parentheses, and *, **, *** indicate significance at the 10%, 5%, and 1% levels of confidence.

Dependent variable:	**Signed return comovement** ρ_{ijt}		
			Followers v.
Treatment	All firms		Leaders
coefficient	(1)	(2)	(3)
$ALLFIRMS$: γ	0.003**	0.003**	
	(0.02)	(0.02)	
$FOLLOWER$: γ_1			0.004***
			(0.00)
$LEADER$: γ_2			−0.002**
			(0.05)
$INBETWEEN$: γ_3			−0.000
			(0.53)
$CONTROLS$	No	Yes	Yes
R^2	0.223	0.223	0.223
F	7.012	18.090	7.841
N	14,549,529	14,549,529	14,549,529

Table IA 7: Within-industry comovement and industry-level recessions

The table shows coefficient estimates of the following eigth regressions:

$$
\begin{aligned}
(1)\ \rho_{ijt} &= \alpha + \beta_t + \gamma TREATED_{ijt} + \epsilon_{ijt} \\
(2)\ \rho_{ijt} &= \alpha + \beta_t + \delta RECESS_{ijt} + \epsilon_{ijt} \\
(3)\ \rho_{ijt} &= \alpha + \beta_t + \gamma TREATED_{ijt} + \delta RECESS_{ijt} + \epsilon_{ijt} \\
(4)\ \rho_{ijt} &= \alpha + \beta_t + \gamma TREATED_{ijt} + \delta RECESS_{ijt} + \mu(TREATED_{ijt} \times RECESS_{ijt}) + \epsilon_{ijt} \\
(5)\ \rho_{ijt} &= \alpha_{SIC3} + \beta_t + \gamma TREATED_{ijt} + \epsilon_{ijt} \\
(6)\ \rho_{ijt} &= \alpha_{SIC3} + \beta_t + \delta RECESS_{ijt} + \epsilon_{ijt} \\
(7)\ \rho_{ijt} &= \alpha_{SIC3} + \beta_t + \gamma TREATED_{ijt} + \delta RECESS_{ijt} + \epsilon_{ijt} \\
(8)\ \rho_{ijt} &= \alpha_{SIC3} + \beta_t + \gamma TREATED_{ijt} + \delta RECESS_{ijt} + \mu(TREATED_{ijt} \times Recess_{ijt}) + \epsilon_{ijt}
\end{aligned}
$$

where $TREATED_{ijt}$ is equal to one if the firm pair ij belongs to an industry subject to a tariff cut in year t, $RECESS_{ijt}$ is equal to one if the firm pair ij belongs to an industry in recession in year t, α_{SIC3} are industry fixed-effects and β_t are year fixed-effects. The dependent variable is the signed value of the annual comovement ρ_{ijt}. A given 3-digit SIC industry month is in recession if the rolling last 36 months (starting at the current month) compounded return is negative. Recession years ($RECESS_{ijt}$) is equal to one years containing at least one such month of recession. The sample period is 1970–2010. The sample of firms encompasses all Compustat-CRSP universe manufacturing firms (4-digit SIC codes 2000 to 3999) listed on the NYSE, AMEX and Nasdaq. The sample of firm pair comovements ρ_{ijt} is limited to within 3-digit SIC industry firm pairs ij. Standard errors are clustered at 3-digit SIC industry level and reported between parentheses under coefficient estimates. R^2 is for R-squared, F is the Fisher test statistic for the joint significance of the regression coefficients. N is the number of observations. *, **, *** indicate significance at the 10%, 5%, and 1% levels of confidence.

Dependent variable:	**Signed ρ_{ijt} value**							
Treament coefficients	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$TREATED_{ijt}$: γ	0.0046***		0.0046***	0.0045***	0.0053***		0.0053***	0.0052***
	(0.0013)		(0.0013)	(0.0014)	(0.0012)		(0.0013)	(0.0013)
$RECESS_{ijt}$: δ		0.0031*	0.0031*	0.0029*		0.0010	0.0008	0.0005
		(0.0017)	(0.0017)	(0.0016)		(0.0011)	(0.0011)	(0.0011)
$TREATED_{ijt} \times RECESS_{ijt}$: μ				0.0003				0.0007
				(0.0008)				(0.0009)
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC fixed-effects	No	No	No	No	Yes	Yes	Yes	Yes
R^2	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
F	13.02	3.21	15.20	12.28	18.60	0.81	36.28	25.54
N	491,142	491,142	491,142	491,142	491,142	491,142	491,142	491,142

Figure IA 1: **Frequency distribution of annual idiosyncratic return comovement**

The figure plots frequency distribution of the annual bi-firm idiosyncratic return correlation coefficients ρ_{ijt}, where

$$\rho_{ijt} \equiv \frac{COV(\epsilon_{it}, \epsilon_{jt})}{\sigma_{\epsilon_{it}} \sigma_{\epsilon_{jt}}}$$

σ indicates standard deviation, and the error term ϵ_{it} is from the following six-factor model generating daily stock returns:

$$r_{it} = \alpha_i + \beta_{\mathbf{i}} \mathbf{F_t} + \epsilon_{it}$$

The daily return factors are $\mathbf{F} = [R_M - R_F,\ SMB,\ HML,\ RMW,\ CMA,\ I_{SIC3}]$, where $R_M - R_F$ is the excess return on the value-weighted market portfolio, SMB, HML, RMW and CMA are the returns on the Fama and French (2015) long-short size, book-to-market, profitability and investment portfolios, and the industry index I_{SIC3} is the value-weighted portfolio of all CRSP firms, excluding firm i, that are in firm i's 3-digit SIC (standard Industrial Classification) manufacturing industry (SIC 2000–3999). Each ρ_{ijt} is estimated using a minimum of 90 daily returns within a each calendar year t. Total sample period is 1970–2010.

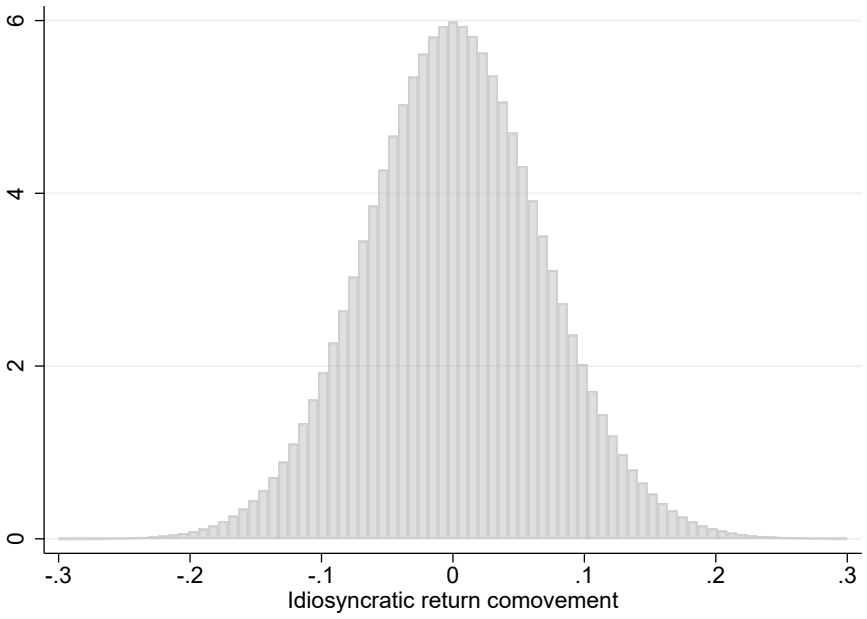

Figure IA 2: **Average comovement and NBER recessions**

The figure displays the evolution through time of yearly average idiosyncratic comovements ρ_t (red curve) and NBER recessions (shaded areas) for the 1970–2010 period. ρ_t is the equally weighted arithmetic average of idiosyncratic stock return comovement between firms i and j in year t, ρ_{ijt} (14,549,929 observation), estimated using Eqs. (1) and (2) in the text.