Online Appendix for "Business Groups and Employment"

(Mara Faccio and William J. O'Brien)

This online appendix reports a number of tests providing further evidence about the robustness of the results in the manuscript. These tests reported below follow the order with which the various topics are covered in the manuscript. In particular, the following robustness tests are described below:

A.1. Robustness tests of the placebo tests (Table 5) discussed in Section II.D;

A.2. Robustness tests of the positive and negative GDP growth tests (Table 6) discussed in Section II.E;

A.3. Falsification tests of the efficient internal labor markets hypothesis test (Table 7, Panel A, specification (1)) discussed in Section III;

A.4. Robustness tests of the diversification hypothesis of internal labor markets (Table 7, Panel B), discussed in Section III;

A.5. Robustness tests using only group affiliated firms for both the diversification hypothesis of internal labor markets (Table 7, Panel B) and financial constraints tests related to the internal capital markets hypothesis (Table 8, specifications (3) and (4)) discussed in Section IV.A;

A.6. A series of other robustness tests.

A.1. Placebo and Counter-Placebo Sample Tests

For the sake of robustness, we repeat our placebo tests with various subsamples of the placebo observations in Table A.1. In specifications (1) through (3), we only use placebo observations where *Worldscope* and *Datastream* data is available to construct all control variables and include or exclude different fixed effects. In each case, the coefficient of *GDP Growth * Placebo Group* remains insignificant. Of course, we recognize that the reasons for the failure of acquisition attempts may itself be endogenous, potentially affecting the inferences from our placebo tests. To address this concern, in specification (4) we include only acquisitions that fail due to plausibly exogenous factors beyond firm control (see also Seru, 2014), namely (i) government or regulatory intervention or (ii) changes in market conditions. After conducting comprehensive news searches in *Factiva* to determine the cause of the failure of each transaction, we find that 39 firms' failed acquisitions were due to government or regulatory intervention or changes in market conditions. The results in specification (4) are based on this sample (consisting of 207 firm-year observations). The coefficient of *GDP Growth * Placebo Group* is in fact positive and significant in specification (4), the opposite of what we would expect if other factors correlated with group affiliation (rather than affiliation itself) are responsible for our paper's main results.

A.2. Positive and Negative GDP Growth

In Table A.2, we test the robustness of our Table 6 results by separating our positive and negative GDP growth variables into "large" and "small" growth variables for our full sample of firms. More specifically, the new variable *GDP Growth Negative Large (Small)* is set equal to GDP Growth if that growth is less than zero and also larger (smaller) in magnitude than a certain negative-value cutoff point and set equal to zero otherwise. Definitions of *GDP Growth Positive Large (Small)* follow similarly. The cutoff points for large and small GDP growth variables are listed at the top of the table. *Ex ante*, we expect internal labor markets (to the extent that they are used) to matter more in deeper recessions (where firms are increasingly likely to fail) and larger booms (when efficient staffing practices are needed to capitalize on growth opportunities). Consistent with this idea, we find that the coefficients of interaction terms with

the "large" GDP growth variables are typically negative and significant in a consistent manner with Table 6, while the coefficients of the "small" GDP growth interaction variables are typically not significant and negative in any of the specifications.

A.3. Internal Labor Markets: Falsification Tests

While we have attempted to control for overall *Q* in our within-group relative Q test in Table 7, Panel A, specification (1), we also conduct several more falsification tests of our ILM hypothesis using Q in Table A.3. In these tests, we use *GDP Growth Positive*, *GDP Growth Negative* and *Group Affiliated* to create double and triple interaction terms with Q-based variables. If our Table 7 result simply reflects a universal relationship between GDP growth, employment growth and Q rather than ILM, we would expect the triple interactions terms between GDP growth, group affiliation, and Q to load in a similar, statistically significant manner. However, we find no evidence of this, whether we simply use *Q* (Table A.3, specification (1)), indicators for whether Q is greater than or less than one (specifications (2) and (3)), or indicators for whether Q is above or below the sample median for a firm (specifications (4) and (5)). These results strongly suggest that the use of *within-group relative Q* is key to our Table 7 result.

A.4. The Diversification Hypothesis of ILM

In Table 7, Panel B, we explored whether group- or firm-level diversification was responsible for the diminished employment sensitivity to economic shocks displayed by group affiliated firms. Table A.4 uses a triple interaction specification with *GDP Growth*, *Group Affiliated*, and an indicator variable *Diversified* that is constructed using the same five approaches for diversification from Table 7 but applied to both group and non-group firms. In all but the first specification, the coefficient of *GDP Growth * Group Affiliated* is negative and statistically significant; since this interaction variable captures employment/output sensitivity for relatively non-diversified firms, this again suggests that our paper's main results are not concentrated solely in diversified firms. The sensitivities in more diversified group firms are typically insignificantly different from those in less diversified group firms (as the coefficient of *GDP Growth* *

*Group Affiliated * Diversified* is not statistically significant in four of five cases), which is further evidence that diversification alone cannot explain our study's main results.

A.5. Tests Using Only Group-Affiliated Firms

Table A.5 uses only group-affiliated firm observations. The first six specifications use the indicator variable *Diversified*, defined as in Table A.4, *GDP Growth*, and an interaction between the two terms. While we do find a significantly negative coefficient of *GDP Growth * Diversified* in specification (1), the significance disappears when fixed effects are reintroduced in specification (2), and the coefficient of *GDP Growth * Diversified* is significantly negative in only one of the four subsequent specifications ((3) through (6)). As in Table A.4, we fail to find strong evidence that the employment/output sensitivities in more diversified group firms are different from those in less diversified group firms. This suggests that the ILM-consistent results that we document in Table 7 are unlikely to be caused by diversification in group-affiliated firms (rather than group affiliation itself).

The last four specifications use *Constrained* (an indicator equal to one if a firm has a value in the top third of either the Whited-Wu or Hadlock-Pierce (size-age) financial constraints indices), *GDP Growth*, and an interaction between the two terms. Specifications (7) and (8) treat the entire group as a single "firm" in the index calculations underlying the construction of *Constrained* (as in Table 8) and for the sake of robustness, specifications (9) and (10) calculate *Constrained* at the firm level. In all four specifications, we fail to find any significant differences between constrained and unconstrained group firm employment sensitivity to economic shocks (insignificant coefficients of *GDP Growth * Constrained*). As with Table 8, we conclude from these results that financial constraints are likely not the primary cause of the diminished group firm employment/output sensitivity we document in our study.

A.6. Other Robustness Tests

In our study's final Appendix table, Table A.6, we perform several additional robustness tests that don't fit as obviously with a particular hypothesis. These tests are divided into three categories; Panel A's

tests examine the robustness of our results to alternative econometric specifications, Panel B provides additional falsification tests, and Panel C uses different subsamples and control variables. These new tests all replicate the test found in Table 3, Panel A, specification (3) with the exception of the differences we detail below.

In Panel A, specification (1), we include country-industry-year fixed effects (rather than separate country-year and industry-year fixed effects), along with firm fixed effects. Panel A, specification (2) clusters errors at the group-firm and country-year level (rather than the firm and country-year levels, as in our main results).[1] To alleviate any potential bias resulting from the inclusion of both firm fixed effects and the lagged dependent variable in the same specification (Guryan, 2004, Angrist and Pischke, 2008), we drop firm fixed effects in specification (3) and *Lag Employment Growth* in specification (4). In all four cases, the coefficient of the key interaction term *GDP Growth * Group Affiliated* remains negative and statistically significant at the 1% level.

In Panel A, specifications (5) and (6), we include *Lag GDP Growth* and the interaction term *Lag GDP Growth * Group Affiliated* as additional terms in regressions that mimic Table 3, Panel A, specifications (2) and (3). Neither *Lag GDP Growth* nor its interaction with *Group Affiliated* load significantly in the tests, while the coefficients and significance levels of (contemporaneous) *GDP Growth* and its interaction with Group Affiliated are similar to their values in Table 3. These results suggest that the employment dynamics we observe do not occur significantly *after* the economic shocks.

In a similar fashion to the previous two specifications, Table A.6, Panel B, specification (1) examines the temporal relationship between employment and growth in our study. This specification uses *Lag Employment Growth* as the dependent variable to see whether group firms *anticipate* economic shocks with their employment changes. With this new (lagged) dependent variable, the coefficient of *GDP Growth * Group Affiliated* loads negatively and significantly, consistent with the notion that at least some employment dynamics precede economic shocks. When compared to the same coefficient of the

[1] To cluster by "groups" in a sample that includes both group and non-group firms, we combine firm-level identifiers in non-group firms with group-level identifiers in group-affiliated firms.

Employment Growth regression in Table 3, Panel A, specification (3), the coefficient is more than halved (from -0.496 to -0.239) and the t-statistic is almost halved (from -3.733 to -1.943). This is consistent with the idea that the strongest ILM actions occur during the economic shocks, with some actions occurring before the shock as well. Since the coefficient of *GDP Growth * Group Affiliated* is largest in magnitude with contemporaneous employment and growth measures, this also mitigates concerns that are results are spuriously generated by a factor that *precedes* the output shock.

The next two specifications use additional controls and interactions to further limit possible sources of confounding variation. In Panel B, specification (2), we interact each firm fixed effect with *GDP Growth.* These additional interactions control for differences across firms in how they respond to economic shocks on average and therefore allow us to identify whether a change in group affiliation status affects the sensitivity of employment growth to economic growth *within firms*. The coefficient of the interaction *GDP Growth * Group Affiliated* remains negative and statistically significant after this change, indicating that our earlier results were not the product of the different average sensitivity of various firms to economic shocks. Specification (3) uses level rather than change control variables (and interactions between *GDP Growth* and these level controls, as in the last specifications in Table 3) to ensure that our main results are not driven by deviations of firm characteristics from their average levels. Once again, the coefficient of the interaction *GDP Growth * Group Affiliated* remains negative and statistically significant.

To test whether differences in distress rates in group and non-group firms are affecting our results, in Panel C, specifications (1) and (2) we condition our sample on the Altman Z-score.[2] In specification (1) we exclude all firms with a bottom-quartile Z-score in our sample or firms without sufficient data to compute Z-score, and in specification (2) we further exclude all firms in the "grey" zone of potential distress

[2] We follow the commonly-used construction of the Z-Score noted by Altman (2000): Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5, where X1 is working capital/total assets, X2 is retained earnings/total assets, X3 is earnings before interest and taxes/total assets, X4 is market value equity/book value of total liabilities, and X5 is sales/total assets. Although the Z-Score was developed using only data on U.S. firms, Altman, Iwanicz-Drozdowska, Laitinen, and Suvas (2017) find that this specification and its coefficients remain suitable for international publicly-traded companies such as ours. We have the data available in Worldscope and Datastream to compute the Z-Score for approximately 83% of our sample firms (the most common limitation is the availability of cash, inventory, and receivables data, which are needed to construct the working capital measure for X1).

(z-scores less than 2.99, per Altman, 2000). In specification (3) we drop observations from the USA and Japan (which make up a large portion of our sample) and from countries where we find no group affiliated firms (using the narrow definition) in our data. Finally, specifications (4) and (5) test whether the use of different control variables affects our results. In specification (4) we include *Firm Age* as an additional control (typically not included elsewhere as the data to construct it is present for only 81% of our sample observations). In specification (5) we include *ProductHHI* (the construction of which is discussed in Section III) as an additional control to see if it has better predictive power than *Business Segments* (our normal control for product segment diversification). The coefficient of the key interaction term *GDP Growth* * *Group Affiliated* remains negative and statistically significant at the 1% level in all five specifications. We also find that the coefficient of *ProductHHI* in specification (5) is insignificantly different from zero.

Online Appendix References

Altman, Edward I., 2000, Predicting financial distress of companies: revisiting the Z-score and ZETA models, New York University Working Paper.

Altman, Edward I., Małgorzata Iwanicz-Drozdowska, Erkki K. Laitinen, and Arto Suvas, 2017, Financial distress prediction in an international context: A review and empirical analysis of Altman's Z-score model, *Journal of International Financial Management & Accounting 28*, 131-171.

Angrist, Joshua D. and Jörn-Steffen Pischke, *Mostly harmless econometrics: An empiricist's companion*. Princeton university press, 2008.

Guryan, Jonathan, 2004, Desegregation and black dropout rates, *American Economic Review* 94, 919-943.

Seru, Amit, 2014, Firm boundaries matter: Evidence from conglomerates and R&D activity, *Journal of Financial Economics* 111, 381-405.

Appendix Table A.1: Alternative Placebo Test Specifications

Appendix Table A.1 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. This table includes all firm-year observations associated with target firms of withdrawn mergers or acquisitions from 1995 to 2011. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *Placebo Group* is an indicator variable equal to zero (one) in the period before (after) the withdrawn merger or acquisition. Specifications (1)-(3) use only observations where data is available for all control variables used in our study. Specification (4) uses observations where data on *Employment Growth, GDP Growth,* and firm ownership is available but restricts the sample to merger and acquisition failures that stemmed from factors outside of firm control (changed market conditions or regulatory intervention). All control variables are included in the first two specifications. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Specification	(1)	(2)	(3)	(4)
Sample	Placebo observations with data for all control vars	Placebo observations with data for all control vars	Placebo observations with data for all control vars	All placebo observations, exogenous reasons for failed M&A only
GDP Growth		0.579	0.462	-0.701
		[0.587]	[1.385]	[-0.718]
Placebo Group	-0.085	-0.057	0.001	-0.076
	[-1.131]	[-1.013]	[0.024]	[-1.427]
GDP Growth * Placebo Group	**0.286**	**0.927**	**0.833**	**2.661***
	[0.159]	**[1.373]**	**[1.478]**	**[1.858]**
N	299	446	657	207
Control Variables?	Yes	Yes	No	No
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Industry-Year	No	No
R-Squared	0.811	0.628	0.026	0.024

Appendix Table A.2: Expansion of Positive and Negative GDP Growth Tests

Appendix Table A.2 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth Positive Large* is a variable equal to *GDP Growth* if the value of that variable is positive and also greater than a certain positive-value cutoff point (listed in the "Definition of Large and Small" heading at the top of the table) and zero otherwise. *GDP Growth Positive Small* is a variable equal to *GDP Growth* if the value of that variable is positive and also less than a certain positive-value cutoff point and zero otherwise. *GDP Growth Negative Large* is a variable equal to *GDP Growth* if the value of that variable is negative and also less than a certain negative-value cutoff point and zero otherwise. *GDP Growth Negative Small* is a variable equal to *GDP Growth* if the value of that variable is negative and also greater than a certain negative-value cutoff point and zero otherwise. The cutoff for Large and Small in specifications (1) and (2) is the median magnitude value of either the positive or negative GDP growth ratios in our sample. The cutoff for Large and Small in specifications (3) and (4) is the 25th percentile magnitude value of either the positive or negative GDP growth ratios in our sample. The cutoff for Large and Small in specifications (5) and (6) is one percent GDP growth for positive GDP growth ratios and negative one percent for negative GDP growth ratios. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. Control variables are included in our tests but omitted from the tables for space. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Specification	(1)	(2)	(3)	(4)	(5)	(6)
Definition of "Large" and "Small"	Large = above-median magnitude, Small = below-median magnitude		Large = three farthest quartiles from zero, Small = closest quartile to zero		Large = > ABS(1%), Small = < ABS(1%)	
GDP Growth Positive Large	0.846***		0.684***		0.741***	
	[4.247]		[3.005]		[3.153]	
GDP Growth Positive Small	1.135***		0.192		0.799	
	[2.624]		[0.377]		[0.553]	
GDP Growth Negative Large	0.466		0.593		0.517	
	[1.292]		[1.616]		[1.414]	
GDP Growth Negative Small	-1.027		2.559		1.381	
	[-0.964]		[1.461]		[0.901]	
Group Affiliated	0.005	0.019*	0.006	0.008	0.007	0.008
	[0.512]	[1.916]	[0.550]	[0.778]	[0.627]	[0.821]
GDP Growth Positive Large	**-0.672*** **	**-0.707*** **	**-0.620*** **	**-0.603*** **	**-0.633*** **	**-0.605*** **
**** Group Affiliated***	**[-3.137]**	**[-3.277]**	**[-2.975]**	**[-2.727]**	**[-2.868]**	**[-2.593]**
GDP Growth Positive Small	-0.324	-1.498**	-0.483	-0.354	-0.080	0.434
** Group Affiliated*	[-0.737]	[-2.568]	[-0.963]	[-0.715]	[-0.039]	[0.194]
GDP Growth Negative Large	**-0.683*** **	**-0.106**	**-0.628*** **	**-0.365***	**-0.619*** **	**-0.346***
**** Group Affiliated***	**[-2.849]**	**[-0.506]**	**[-2.632]**	**[-1.757]**	**[-2.661]**	**[-1.700]**
GDP Growth Negative Small	-0.053	1.867*	-0.392	0.334	-0.239	0.927
** Group Affiliated*	[-0.058]	[1.827]	[-0.298]	[0.256]	[-0.189]	[0.747]

N	48,939	48,914	48,939	48,914	48,939	48,914
Control variables?	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects?	Firm, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.369	0.406	0.369	0.406	0.369	0.406

Appendix Table A.3: Falsification Tests for Group Firm Q Tests

Appendix Table A.3 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *Q* is defined as the market value of equity plus the book value of liabilities, all divided by the book value of assets. *GDP Growth Positive* is a variable equal to *GDP Growth* if the value of that variable is positive and zero if the value of *GDP Growth* is negative. *GDP Growth Negative* is a variable equal to zero if the value of *GDP Growth* is positive and *GDP Growth* if the value of that variable is negative. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. In specifications (2) through (5), *Q_Ind* is defined based on different values of *Q*, as stated in the table header. Uninteracted *GDP Growth Positive* and *GDP Growth Negative* are omitted due to their perfect collinearity with the country-year fixed effects. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Proxy for firm opportunity	*Q* (standard definition used in paper)	*Q_Ind* = 1 if Q < 1	*Q_Ind* = 1 if Q $\geq$ 1	*Q_Ind* = 1 if Q is below median among all sample observations	*Q_Ind* = 1 if Q is above median among all sample observations
	(1)	(2)	(3)	(4)	(5)
Group Affiliated	0.013	0.006	0.014	-0.001	0.013
	[0.792]	[0.524]	[1.195]	[-0.103]	[1.418]
Q	0.028***				
	[6.330]				
Q_Ind		-0.022***	0.022***	-0.023***	0.023***
		[-4.395]	[4.395]	[-4.278]	[4.278]
*GDP Growth Positive * Group Affiliated*	-0.662*	-0.651***	-0.476	-0.511*	-0.576**
	[-1.861]	[-2.685]	[-1.515]	[-1.845]	[-2.278]
*GDP Growth Negative * Group Affiliated*	0.105	0.367	-0.552*	0.116	-0.369*
	[0.168]	[0.768]	[-1.963]	[0.141]	[-1.906]
*GDP Growth Positive * Q*	-0.100				
	[-0.901]				
*GDP Growth Negative * Q*	-0.097				
	[-0.865]				
*Group Affiliated * Q*	-0.006				
	[-0.423]				
*GDP Growth Positive * Q_Ind*		0.019	-0.019	0.064	-0.064
		[0.142]	[-0.142]	[0.462]	[-0.462]
*GDP Growth Negative * Q_Ind*		-0.076	0.076	-0.048	0.048
		[-0.468]	[0.468]	[-0.274]	[0.274]
*Group Affiliated * Q_Ind*		0.008	-0.008	0.015	-0.015
		[0.522]	[-0.522]	[1.027]	[-1.027]

GDP Growth Positive	0.084				
* *Group Affiliated * Q*	[0.368]				
GDP Growth Negative	-0.508				
* *Group Affiliated * Q*	[-0.704]				
GDP Growth Positive		0.175	-0.175	-0.065	0.065
* *Group Affiliated * Q_Ind*		[0.498]	[-0.498]	[-0.210]	[0.210]
GDP Growth Negative		-0.919	0.919	-0.485	0.485
* *Group Affiliated * Q_Ind*		[-1.565]	[1.565]	[-0.571]	[0.571]
N	48,395	48,395	48,395	48,395	48,395
Control Variables?	Yes	Yes	Yes	Yes	Yes
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.408	0.408	0.408	0.408	0.408

Appendix Table A.4: Triple Interaction Diversification Tests

Appendix Table A.4 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *Diversified* is an indicator variable that equals one if a firm (group or non-group) fulfills the diversification criterion at the top of the table and zero otherwise. In specification (1), *Diversified* equals one if a firm (or any of its affilaited firms) has more than one distinct product segment (as listed in *Datastream* and *Worldscope*) or it belongs to a group with at least two firms with different primary two-digit SIC industry codes. In specifications (2) through (4), a firm is considered diversified if it has more than two, three, or four product segments (respectively). In specification (5), a firm is considered diversified if its product segment sales Herfindahl-Hirschman index is below-median among all firm-years in the sample. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. Uninteracted *GDP Growth* is omitted due to its perfect collinearity with the country-year fixed effects. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Variables	*Diversified = 1 if* firm (or affiliate) has > 1 product segment or multiple industries represented in group	*Diversified* = 1 if firm has > 2 product segments	*Diversified* = 1 if firm has > 3 product segments	*Diversified* = 1 if firm has > 4 product segments	Diversified = 1 if *ProductHHI* is below sample median
Specification	(1)	(2)	(3)	(4)	(5)
Group Affiliated	-0.007	0.012	0.006	0.000	0.008
	[-0.308]	[1.160]	[0.598]	[0.023]	[0.760]
Diversified	0.009	0.004	0.004	0.008**	0.004
	[1.574]	[1.071]	[1.232]	[2.008]	[0.977]
GDP Growth * Group Affiliated	**-0.250**	**-0.528*** **	**-0.440*** **	**-0.355** **	**-0.387***
	[-0.540]	**[-2.639]**	**[-2.644]**	**[-2.395]**	**[-1.956]**
*GDP Growth * Diversified*	-0.198**	-0.075	-0.016	-0.025	0.069
	[-2.078]	[-0.867]	[-0.222]	[-0.287]	[0.873]
*Group Affiliated * Diversified*	0.011	-0.010	-0.002	0.021	-0.007
	[0.545]	[-0.994]	[-0.195]	[1.219]	[-0.573]
GDP Growth * Group Affiliated * Diversified	**-0.236** **[-0.470]**	**0.037** **[0.175]**	**-0.116** **[-0.640]**	**-0.596** ** **[-2.565]**	**-0.208** **[-1.051]**
N	48,914	48,914	48,914	48,914	48,602
Control Variables?	Yes	Yes	Yes	Yes	Yes
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.406	0.406	0.406	0.406	0.406

Appendix Table A.5: Tests Using Only Group-Affiliated Firms

Appendix Table A.5 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. This table's tests include only firm-years that are group affiliated, using the narrow definition of business groups as defined in Table 3. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *Diversified* is an indicator variable that equals one if a firm (group or non-group) fulfills the diversity criterion at the top of the table and zero otherwise. In specifications (1) and (2), *Diversified* equals one if a firm (or any of its affiliated firms) has more than one distinct product segment or it belongs to a group with at least two firms with different primary two-digit SIC industry codes. In specifications (3) through (5), a firm is considered diversified if it had more than two, three, or four product segments (respectively). In specification (6), a firm is considered diversified if its product segment sales Herfindahl-Hirschman index is below-median among all (group and non-group) firm-years in the sample. In specifications (7) through (10) we define *Constrained* as an indicator equal to one if a firm has a value in the top third of either the Whited-Wu (WW) or Hadlock-Pierce (size-age or SA) financial constraints indices (among all group and non-group firms) and zero otherwise. In specifications (7) and (8), the WW and SA indices are calculated at the group level and that group-level index value is used for every individual firm in the group. In specifications (9) and (10), the WW and SA indices are calculated at the firm level. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Sample	Group firms only	Group firms only	Group firms only	Group firms only	Group firms only	Group firms only
Variable	*Diversified* calculated at group level	*Diversified* calculated at group level	*Diversified* = 1 if firm has > 2 product segments	*Diversified* = 1 if firm has > 3 product segments	*Diversified* = 1 if firm has > 4 product segments	Diversified = 1 if *ProductHHI* is below group firm median
Specification	(1)	(2)	(3)	(4)	(5)	(6)
GDP Growth	0.947***					
	[3.067]					
Diversified	0.030**	0.019	0.013	-0.006	0.020	0.006
	[2.283]	[0.739]	[0.988]	[-0.412]	[0.725]	[0.389]
GDP Growth * Diversified	**-0.772****	**0.265**	**-0.172**	**-0.100**	**-0.845*****	**-0.360**
	[-2.455]	**[0.569]**	**[-0.623]**	**[-0.375]**	**[-2.679]**	**[-1.560]**
N	4,204	3,446	3,446	3,446	3,446	3,419
Control Variables	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*
Fixed Effects?	No	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.026	0.552	0.552	0.551	0.553	0.552

Sample	Group firms only	Group firms only	Group firms only	Group firms only
Variable	*Constrained* calculated at group level	*Constrained* calculated at group level	*Constrained* calculated at firm level	*Constrained* calculated at firm level
Specification	(7)	(8)	(9)	(10)
GDP Growth	0.223*		0.204	
	[1.646]		[1.215]	
Constrained	0.006	0.018	-0.005	-0.032**
	[0.747]	[0.752]	[-0.777]	[-2.014]
GDP Growth * Constrained	**-0.078**	**-0.523**	**0.172**	**-0.313**
	[-0.369]	**[-1.397]**	**[0.923]**	**[-1.213]**
N	4,203	3,444	4,047	3,290
Control Variables?	Yes	Yes	Yes	Yes
Fixed Effects?	No	Firm, Country-Year, Industry-Year	No	Firm, Country-Year, Industry-Year
R-Squared	0.026	0.552	0.028	0.556

Appendix Table A.6: Other Robustness Tests

Appendix Table A.6 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one, in all specifications except Panel B, specification (1), which uses the lagged value of *Employment Growth* as the dependent variable. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. All specifications use our full sample of firm-year observations, except for Panel C, specification (1), which drops firms in the bottom quartile of Altman Z Score (calculated as in Altman, 2000), Panel C, specification (2), which drops firms with Z Scores below 2.99, and Panel C, specification (3), which drops observations from USA, Japan, and countries with no group observations in our sample. Panel A, specifications (5) and (6) include the lagged value of *GDP Growth* as an additional control variable; both the current and lagged values of *GDP Growth* are interacted with *Group Affiliated* in these tests. Panel C, specification (4) includes *Firm Age* as an additional control variable. Panel C, specification (5) includes *ProductHHI*, defined as in Table 7, as an additional control. In Panel B, specification (3), level control variables (rather than change control variables) are included, and *GDP Growth* is additionally interacted with these level control variables. Uninteracted *GDP Growth* is included in specification (5), Panel A, but omitted from every other specification due to its perfect collinearity with the fixed effects. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Panel A: Robustness to Alternative Econometric Specifications

Sample/Variables	Country-industry-year fixed effects	Error clustering at group-firm and country-year levels	Drop firm fixed effects, keep lag *Employment Growth*	Drop lag *Employment Growth*, keep firm fixed effects	Full sample, *Lag GDP Growth* and interaction included	Full sample, *Lag GDP Growth* and interaction included
Specification	(1)	(2)	(3)	(4)	(5)	(6)
GDP Growth					0.681***	
					[4.523]	
Group Affiliated	0.017*	0.005	-0.007**	0.005	0.009	0.007
	[1.725]	[0.659]	[-2.126]	[0.600]	[0.947]	[0.785]
GDP Growth * Group Affiliated	**-0.447*** **	**-0.496*** **	**-0.274*** **	**-0.467*** **	**-0.631*** **	**-0.495*** **
	[-3.013]	**[-3.661]**	**[-3.304]**	**[-3.545]**	**[-5.408]**	**[-3.871]**
Lag GDP Growth					0.022	
					[0.107]	
Lag GDP Growth * Group Affiliated					**-0.109**	**-0.115**
					[-0.802]	**[-0.769]**
N	43,273	48,914	51,150	48,914	48,939	48,914
Control Variables?	All	All	All	All but Lag EG	All	All
Fixed Effects?	Firm, Country-Industry-Year	Firm, Country-Year, Industry-Year	Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.487	0.407	0.167	0.397	0.369	0.406

Panel B: Robustness to Falsification Tests

Sample/Variables	Dependent variable = lag employment growth	Full sample, includes *GDP Growth Ratio* interacted with all firm fixed effects	Full Sample, includes level (rather than change) controls, interactions of level controls with *GDP Growth*	
Specification	(1)	(2)	(3)	
Group Affiliated	0.001	0.013	0.007	
	[0.149]	[1.05]	[0.885]	
GDP Growth * Group Affiliated	**-0.239***	**-0.526****	**-0.399*****	
	[-1.943]	**[-2.15]**	**[-2.599]**	
			Uninteracted	Interacted w/ GDP Growth
Lag Log Sales			-0.101***	0.949***
			[-12.918]	[4.988]
Lag ROA			0.431***	-2.669***
			[12.036]	[-4.197]
Lag Debt Ratio			-0.067***	-0.244
			[-4.173]	[-0.510]
Lag Q			0.036***	-0.081
			[11.244]	[-1.147]
Lag Capex/Assets			0.001***	0.007
			[3.702]	[0.886]
Lag RetVol			-0.491***	0.915
			[-5.283]	[0.568]
N	48,914	48,914	47,257	
Control Variables?	All	All	All	
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm interacted with *GDP Growth*, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	
R-Squared	0.492	0.584	0.429	

Panel C: Robustness to Alternative Samples and Control Variables

Sample/Variables	Bottom quartile Altman Z Score firms dropped	Altman Z Score < 2.99 (not in "safe" zone) dropped	USA, Japan, and countries with no group observations dropped	Full sample, *Firm Age* included as a control	Full sample, *ProductHHI* included as a control
Specification	(1)	(2)	(3)	(4)	(5)
Group Affiliated	0.014	0.012	0.014	0.009	0.005
	[1.413]	[0.998]	[0.964]	[1.074]	[0.573]
GDP Growth * Group Affiliated	**-0.427*** **	**-0.504*** **	**-0.723*** **	**-0.492*** **	**-0.500*** **
	[-2.639]	**[-2.676]**	**[-3.192]**	**[-3.287]**	**[-3.721]**
Firm Age				-0.005***	
				[-6.462]	
ProductHHI					0.001
					[0.119]
N	38,336	26,907	20,637	39,587	48,602
Control Variables?	All	All	All	All	All
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.415	0.414	0.442	0.400	0.406