



Corporate diversification and downsizing decisions: International evidence from sharp and sudden performance shocks

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ABSTRACT

While firms regularly reduce workforce following sharp performance decline, diversified firms may abstain from employment downsizing by transferring capital and labor between segments (the *allocative flexibility effect*). However, downsizing may be more likely if a performance shock leads to efforts to reduce inefficiency in resource allocation (the *inefficient internal market effect*). Using a large cross-country dataset, our results provide strong support for the inefficient internal market effect. We find that diversified firms are more likely to downsize and the national employment protection and union power laws moderate this link. We also find that diversified firms with more excess employment are more likely to downsize and that downsizing following major adverse performance shocks is associated with lower level of diversification and excess employment.

1. Introduction

Firms frequently downsize in response to adverse shocks to their operating performance (see e.g. Atanassov & Kim, 2009; Hillier, Marshall, McColgan, & Werema, 2007). The significance of corporate diversification for employment downsizing is still a relatively unexplored area despite employees representing a core stakeholder group and the negative impacts of excessive downsizing on future organizational capabilities.¹ We develop and test hypotheses regarding a link between corporate diversification and employment downsizing decisions after sudden and adverse shocks to operating performance. Moreover, we evaluate the moderating role of national employment protection and union power laws in downsizing decisions.

Given that many – if not most – adverse shocks are transitory (Gorbenko & Strebulaev, 2010), firms may not engage in employment downsizing immediately. While employment downsizing could improve profitability in the short-run (Kang & Shivdasani, 1997), it could have long run negative effects on firm value due to employment adjustment costs (e.g. severance, re-hiring costs and training costs) (e.g. Blatter,

Muehleemann, & Schenker, 2012), and reductions in workers' motivation and productivity (Datta, Guthrie, Basuil, & Pandey, 2010). Within this context, we highlight the possible effects of corporate diversification on firms' downsizing decisions following adverse performance shocks. More optimistic accounts point to the 'bright side' of corporate diversification, i.e. greater ability of diversified firms in absorbing shocks and reallocating resources to avoid having to use external markets. From this perspective, the presence of the internal capital/labor markets in multi-segment firms could enable these firms to avoid downsizing immediately after an adverse shock through inter-segmental allocation of funds and/or through reallocation of workers away from poorly performing segments (Stein, 1997; Tate & Yang, 2015). From this perspective, we submit that diversified firms are less likely than single-segment firms to downsize immediately after an adverse shock to their operating performance (the *allocative flexibility hypothesis*).

On the other hand, more skeptical accounts could point to the 'dark side' of the internal capital markets where diversified firms are inefficient in allocating resources. For example, segment managers may engage in influence activities to capture resources from the headquarters

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¹ Earlier studies examined diversified firms' downsizing via divestitures (e.g. Ataulah, Davidson, & Le, 2010; John & Ofek, 1995).

(Scharfstein & Stein, 2000; Rajan, Servaes, & Zingales, 2000; Wulf, 2009, cf. Stein, 1997) or diversified firms divert resources to prop up unviable segments (see e.g. Ozbas & Scharfstein, 2010), which, in turn, attributes to the so-called *diversification discount* (Kuppuswamy, Serafeim, & Villalonga, 2014; Maksimovic & Philips, 2007). A sudden and substantial shock to operating performance could prompt the headquarters to reduce previous inefficient resource allocation in the form of employment downsizing. From this perspective, we submit that diversified firms are more likely than single-segment firms to downsize immediately after an adverse shock to their operating performance (the *inefficient internal market hypothesis*).

Our study contributes to existing literature in at least three important ways. First, we provide novel evidence on the significance of corporate diversification² in terms of downsizing decisions following performance shocks by considering the role that allocative flexibility and inefficient internal resource allocation might play. Second, we provide evidence of excess employment in diversified firms and how it is linked to downsizing decisions following major adverse shocks. Finally, we use a cross-country setting to evaluate how the differences between diversified firms and single-segment firms in downsizing decisions vary with national employment protection and union power laws. Strong employment protection and collective relation laws tend to reduce job destruction as it makes adjustment through redundancies/dismissal more costly (Botero, Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2004). However, such laws may also hamper labor reallocation and allocative efficiency (Bertola, 1992; Lafontaine & Sivadasan, 2009). How firms' employment decisions in response to major performance shocks in different national settings is an interesting yet unexplored area.

We begin by identifying firms with sudden and major performance shocks. To ensure that we do not include firms that already experience prolonged poor performance and/or engage in pre-planned employment downsizing, we define firms with sudden and major performance shocks as those being financially healthy, i.e. performing better than industry peers, in year ($t-1$) and witnessing at least 50% drop in earnings in year (t). Based on a large sample of publicly listed firms in 33 countries during 1997–2018, we observe that sudden and adverse performance shocks are rare events – only 5% firm-year observations in our sample can be classified into this category. We also observe that downsizing is common among firms that witness major adverse shocks. About 45% of firms with performance shocks downsize at least 5% of the workforce and about a fifth of the firms downsize at least 20% of the workforce. In the exploratory analysis, we report that diversified firms are not more likely to experience major performance shocks than single-segment firms.

To properly evaluate the effect of diversification on downsizing decisions, we must consider that the diversification of firms is not a random process (Campa & Kedia, 2002; Villalonga, 2004). To account for the selection of firms into diversified status, we use the Heckman two-step selection model approach (Heckman, 1979) in which we model the firm's decision to diversify as a function of firm characteristics and national laws in the first step and in the second step we estimate the probability that a firm downsizes its employment as a function of the diversification status, controlling for firm- and country-specific factors. Our key finding is that diversified firms are more likely to downsize than single-segment firms following sudden and major performance shocks, and that strong employment protection and union power laws alleviate this effect. This suggests that our results support the *inefficient internal market effect* and the impact of the effect could vary with national laws.

In addition to our analysis of the likelihood of cutting jobs in response to major shocks, we find evidence that diversified firms have excess employment in the sense that they employ more workers than a portfolio of comparable single-segment firms does. This finding is in line

with the existing evidence of inefficient internal market and diversified firms being valued at discount (Kuppuswamy et al., 2014; Ozbas & Scharfstein, 2010). We also find that diversified firms with more excess employment are more likely to cut jobs and that downsizing by diversified firms following performance shocks is associated with reduction in excess employment and level of diversification. This provides further supports for our proposition that adverse shocks prompt diversified firms to reduce inefficiency in the internal market via downsizing. Our results withstand a battery of comprehensive robustness checks with multiple alternate measures and sampling methods.

Our paper is related to but substantially different from the growing literature that examines the role of business structure in employment decisions. Giroud and Mueller (2015) report that diversified firms in the US transfer workers to segments in locations with positive shocks to investment opportunities. Tate and Yang (2015) find that diversified firms in the US redeploy displaced workers from their closed establishments. Similarly, Cestone, Fumagalli, Kramarz, and Pica (2017) show that French group-affiliated firms absorb workers following mass layoffs and plant closures in other firms within a business group. Faccio and O'Brien (2021) find that workforce expansion and contraction in firms affiliated with business groups are less sensitive to business cycles when compared to non-affiliated firms. The focus of our paper differs from these studies. We examine the proclivity to downsizing in response to adverse shocks, rather than the decision to redeploy already dismissed workers (c.f. Tate & Yang, 2015; Cestone et al., 2017) or employment fluctuations (c.f. Faccio & O'Brien, 2021).

The rest of the paper proceeds as follows. Section 2 reviews the related literature and states the hypotheses. Sections 3 and 4 present our data, samples and empirical analysis. Section 5 concludes.

2. Related literature and hypotheses

2.1. Flexibility of inter-segmental allocation of resources in diversified firms

The literature on corporate diversification builds upon Coase's seminal work on the 'boundaries of the firm', and on the significance of markets and hierarchies in the allocation of resources (see Coase, 1937). This literature has focused on the inter-segmental transfer of financial resources: the internal capital markets could enable firms to undertake investment opportunities that they would otherwise have to forgo due to agency and information problems in raising capital externally (Scharfstein & Stein, 2000; Stein, 1997). A similar argument may be put forward for the inter-segmental transferring of labor, in which firms could shift human resources to segments with best investment opportunities. Giroud and Mueller (2015) report that diversified firms transfer workers from less productive and/or non-core segments to segments in locations with new airline routes which improve monitoring and knowledge sharing between headquarters and segments. In Tate and Yang (2015), redeployment of displaced workers from closed establishments would allow reallocation of labour to segments/establishments with better opportunities.

Building on the existing literature, we assume that there are costs relating to employment adjustments, which include firing costs (Bertola, 1992) and hiring costs (Abowd & Kramarz, 2003; Blatter et al., 2012). From a shareholders' perspective, premature employment downsizing immediately after an adverse shock may be harmful as short-term financial savings from downsizing can be smaller than employment adjustment costs. Diversified firms have the option, which they frequently exercise, to engage in inter-segmental allocation, e.g. transferring employees from worst hit segments to segments that are relatively unscathed by the adverse shock to avoid downsizing. While such labour reallocation may not solve financial pressure from the shock, it might increase productivity, retain firm-specific human capital and save current and future labour adjustment costs. We call this the allocative flexibility effect and offer the following hypothesis:

² For an extensive review, see Maksimovic and Philips (2007).

Hypothesis 1. *Given the allocative flexibility effect, the likelihood of downsizing after an adverse shock is **lower** for diversified firms compared to that for single-segment firms.*

2.2. Inefficiency in inter-segmental allocation of resources in diversified firms

Given that the nature of an adverse shock (i.e. whether permanent or transitory) is unknown (Gorbenko & Strebulaev, 2010), both multi-segment and single-segment firms might not find it optimal to downsize immediately. Yet, the shock might prompt multi-segment firms to adjust employment to reduce previous inefficient resource allocation, which could be the result of segment managers, who have the capacity and incentives, distorting information about their segments' prospects to extract resources from the headquarters (Rajan et al., 2000; Scharfstein & Stein, 2000; Wulf, 2009) or diversified firms previously diverting resources to prop up unviable segments (see e.g. Ozbas & Scharfstein, 2010). This inefficiency, in turn, results in the so-called *diversification discount* where diversified firms being valued lower than the portfolios of comparable single-segment firms.³ Inefficiency in the internal capital market might also lead to diversified firms having excess employment in the sense that they employ more workers than a portfolio of comparable single-segment firms does. If excess employment could be considered as the result of inefficient resource allocation, using the same argument that the existing literature has on diversification discount, diversified firms would have the incentives to downsize employment following an adverse performance shock. This would be in order to reduce inefficiency and excess employment. We call this the inefficient internal market effect and offer the following hypotheses:

Hypothesis 2. *Given the inefficient internal market effect, the likelihood of downsizing after an adverse shock is **higher** for diversified firms compared to that for single-segment firms.*

Hypothesis 3. *Given the inefficient internal market effect, the likelihood of downsizing after an adverse shock is **higher** for diversified firms with higher pre-shock excess employment compared to that for diversified firms with lower pre-shock excess employment.*

2.3. Corporate diversification, downsizing and national institutional settings

There is a plethora of empirical evidence that employment protection, collective relations and union power laws play a substantial role on employment adjustment. Countries vary substantially in terms of laws and regulations that protect employees, which, in turn, could explain cross-country variations in firms' downsizing decisions (Botero et al., 2004; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008). Strong employment protection regulations reduce job destruction but also job creation (Bertola, 1992) and hinder firms' ability to adjust employment (Mortensen & Pissarides, 1999), making downsizing less likely (Lafontaine & Sivadasan, 2009). It is therefore plausible that stringent employment protection and union power laws exacerbate the cost of procuring resources (financial or non-financial) in the external markets and make the option to reallocate labor internally more valuable. We seek to examine whether and how downsizing decisions vary with national laws varies with corporate diversification and whether national laws moderate the link between corporate diversification and employment decisions.

Hypothesis 4. *The likelihood of downsizing after an adverse shock is*

³ For evidence of discount in the US see Berger and Ofek (1995), Lang and Stulz (1994); for cross-country evidence, see Kuppaswamy et al. (2014). See Campa and Kedia (2002) and Villalonga (2004) for evidence questioning the existence of discount.

Table 1
Variable description.

Variable	Definition
<i>Firm-level variables are from WorldScope</i>	
<i>DIV_Dummy</i>	A dummy variable that takes a value of 1 if the firm reports at least two segments with distinct four-digit SIC codes and positive segment sales and 0 otherwise.
<i>NumSeg</i>	Number of segments with distinct four-digit SIC codes that the firm reports.
<i>Excess_Emp</i>	The natural log of the ratio of employment to imputed employment. Imputed employment is the sum of segments' imputed employment, which is obtained by multiplying the segment's sales by the median ratio of number of employees to sales for single-segment firms in the same industry based on the three-digit SIC category that includes at least five single-segment firms.
<i>InverseMillsRatio</i>	The Inverse Mills Ratio which represents the effect of unobservable variables that might influence firms' choice to be diversified. This is estimated based on the first stage in the Heckman selection model.
<i>Labor</i>	Number of employees.
<i>Downsizing5</i>	A dummy variable that takes a value of 1 if the firm cuts its workforce by at least 5% from year $t-1$ to year $t+1$ and 0 otherwise.
<i>Downsizing20</i>	A dummy variable that takes a value of 1 if the firm cuts its workforce by at least 20% from year $t-1$ to year $t+1$ and 0 otherwise.
<i>Size</i>	Logarithm of total assets in 2005 US\$.
<i>MB</i>	Market-to-book value.
<i>Lev</i>	Total debt to total assets.
<i>EBITDA</i>	Earnings before interest, taxes, depreciation and amortization in 2005 US\$.
<i>EBITDA/TA</i>	Earnings before interest, taxes, depreciation and amortization over total assets
<i>MinorInterest</i>	A dummy variable that takes a value of 1 if the firm reports a non-zero amount for the minority interest on its balance sheet and 0 otherwise
<i>Country-level variables are from Botero et al. (2004) and Djankov et al. (2008)</i>	
<i>EmpLaw</i>	Index that measures the rigidity of employment laws as the average of: (1) Alternative employment contracts; (2) Cost of increasing hours worked; (3) Cost of firing workers; and (4) Dismissal procedures from Botero et al. (2004).
<i>UnionPower</i>	Index that measures the protection of collective relations laws as the average of: (1) Labor union power and (2) Collective disputes from Botero et al. (2004).
<i>ShareholderLaw</i>	Sum of normalized values of the Antidirector index and the Anti-self-dealing index from Djankov et al. (2008). These indexes assess the stance of corporate law towards shareholder protection and the legal protection of minority shareholders against expropriation by corporate insiders.

lower for diversified firms in countries with more stringent employment laws.

3. Data and variables

3.1. Data and sample construction

We collect financial and accounting data from the WorldScope database for publicly listed firms during 1997–2018. We impose filters that are standard in cross-country studies (Faccio & O'Brien, 2021; Kuppaswamy et al., 2014). We exclude firms if the stock exchange of their primary listing is not the main stock exchange of the countries where their headquarters are registered to ensure that we only keep firms operating under the employment, union and shareholders protection laws of the same country. We exclude all financial firms (one-digit SIC code of 6), utility firms (two-digit SIC code of 49) and agriculture firms (one-digit SIC code of 0) as these firms follow different reporting rules. We also exclude multi-segment firms that report financial, utility and agriculture segments. We only keep firms that have data available for key variables for at least three consecutive years and for at

Table 2
Number of sample firms by country.

	Number of firm-years	Diversified firm-years	Number of firm-years with shock	Diversified firm-years with shock
Australia	1434	45.33%	69	24.64%
Belgium	449	44.54%	24	45.83%
Brazil	247	37.25%	11	9.09%
Canada	2958	31.51%	164	23.17%
Chile	121	38.02%	1	0.00%
Denmark	597	57.62%	34	55.88%
Finland	848	59.67%	56	58.93%
France	6170	58.64%	257	53.31%
Germany	4207	64.32%	223	65.47%
Greece	1025	43.12%	64	62.50%
Hong kong	7831	66.01%	533	68.29%
India	5370	40.78%	178	34.83%
Indonesia	2465	69.86%	155	68.39%
Israel	486	26.34%	22	40.91%
Italy	1496	72.06%	63	68.25%
Japan	44,044	82.74%	1776	84.12%
Malaysia	2125	60.71%	113	61.06%
Mexico	337	57.57%	4	75.00%
Netherlands	568	54.05%	23	30.43%
Norway	710	58.17%	44	43.18%
Philippines	244	50.00%	12	58.33%
Portugal	62	90.32%	1	100.00%
Singapore	762	76.12%	42	66.67%
South Africa	761	58.34%	35	48.57%
South Korea	11,328	31.08%	746	27.21%
Spain	393	73.03%	13	61.54%
Sweden	2328	55.58%	129	61.24%
Switzerland	822	64.48%	22	68.18%
Taiwan	11,531	25.82%	558	21.15%
Thailand	1701	32.33%	48	22.92%
Turkey	1571	22.66%	160	16.88%
United Kingdom	11,602	43.34%	644	38.20%
United States	38,694	41.28%	1936	36.62%
Total	165,287		8160	

This table presents the number of all firm-years and firm-years that experience performance shocks. It also shows the percentage of diversified firm-years in each category.

least five firms in a two-digit SIC industry in a given year and with at least 50 employees. This results in a sample of 165,287 firm-year observations in 33 countries.

To construct the sample of firms that experience a sudden and substantial shock to operating performance, we follow the same procedure as in Kang and Shivdasani (1997) and Atanassov and Kim (2009). We select firms that are financially 'healthy' in year ($t-1$) and face a performance shock in year (t). Financially healthy firms are those with positive and above-industry median $EBITDA/TA$, defined as the ratio of operating income over total assets.⁴ The industry median is based on the three-digit SIC code with at least five firms in a given industry in a given country in a given year.⁵ This yields a sample of 8160 firms that experience a performance shock of at least 50% decline in earnings before interest, taxes, depreciation and amortization ($EBITDA$) in year (t) compared to year ($t-1$). This procedure ensures that we include only firms that are not financially distressed and do not have prolonged poor performance before the shocks. At the same time, we recognize that an evaluation of the separate case of financially distressed firms is of considerable importance and would represent a fertile avenue for future research. We measure downsizing from year ($t-1$) to year ($t+1$) to

⁴ We assign industry code to diversified firms using industry of the segment with largest segment sales.

⁵ We use the two-digit SIC code when there are fewer than five firms in a three-digit SIC code.

mitigate possible noise in firm reporting of changes in employment (as documented in Hallock, 1998) or organizational/managerial slack in responding to a shock to operating performance. Tables 1 and 2 provide variable descriptions and distribution of firm-year observations for the full sample and for the firm-years that experience shocks by country, respectively. (See Table 2.)

3.2. Variables

We use Worldscope's segment-level data to construct measures of diversification. All our diversification-related measures are based on segment sales due to missing data in segment assets. This issue with data is acknowledged in Kuppuswamy et al. (2014). DIV_Dummy is a dummy variable that takes a value of 1 if a firm reports at least two segments with distinct four-digit SIC codes and non-negative segment sales, and 0 otherwise. We aggregate sales of all segments with the same four-digit SIC codes. If a firm reports more than one segment but all segments share the same four-digit SIC code, it is classified as a single-segment firm. Despite being simple, this measure fulfils our aim of distinguishing between diversified and single-segment firms in a cross-country context. The difference between diversified firms and single-segment firms in terms of diversification discount is greatest between one-segment and two-segment firms (Lang & Stulz, 1994). $NumSeg$, the number of segments with distinct four-digit SIC codes and non-negative segment sales that a firm reports, is an alternative measure for diversification. We calculate excess employment $Excess_Emp$ as the natural log of the ratio of a firm's employment to the sum of its segments' imputed employment calculated based on the product of segment sales and the median ratio of employment to sales for single-segment firms in the same industry, country, and year. The industry matching is carried out using the narrowest SIC grouping that includes at least three single-segment firms. This measure is constructed in a similar manner as the diversification discount and thus might suffer from similar weaknesses such as reduced samples due to data availability and validity of using industry peers (see Campa & Kedia, 2002; Villalonga, 2004).

There is no clear indication from prior research on what constitutes employment downsizing. Worrell, Davidson, and Sharma (1991), for example, report that a third of the layoff announcements involve 4.5% or more of the total workforce. Kang and Shivdasani (1997) report a mean layoff of 20.9% of the total workforce, but their sample includes only 16 firms. Guthrie and Datta (2008) advocate the use of a dichotomous measure as being easier to interpret than a continuous measure of changes in employment, which would reflect both expansion and downsizing. Although corporate announcements on layoffs could provide more detailed and accurate scale of downsizing, we are not able to obtain such announcements for firms in our multi-country sample due to language barriers and the lack of reliable database. Furthermore, when a firm experiences an adverse performance shock, it may reduce benefits of employments, which in turn may lead to voluntary leave.⁶ However data on voluntary leave are not available for firms in our cross-country sample. Consequently, we focus on the changes in reported number of workers and use two cut-off points to define small- and large-scale downsizing. $Downsizing5(Downsizing20)$ are dummy variables that takes a value of 1 if a firm downsizes at least 5% (20%) of its workforce from year ($t-1$) to year ($t+1$) and 0 otherwise.

We account for several firm characteristics. $Size$ is the logarithm of total assets in 2005 US dollars. Lev is the ratio of total debt over total assets. MB is the market to book value. $EBITDA/TA$ is the ratio of earnings before interest, taxes, depreciation and amortization to total assets. All firm-level continuous variables are winsorized at the 1% and 99% levels. We use $EmpLaw$ which measures the rigidity of employment laws based on the costs and procedures to fire/dismiss workers and to set up alternative employment contracts and $UnionPower$ which measures

⁶ We thank an anonymous referee for suggesting this.

Table 3
Diversification and probability of experiencing performance shock.

	Probability of Shock		Probability of Shock – Heckman Selection		
	[1]	[2]	<i>Diversified (1st stage)</i>	[3]	[4]
<i>Size</i>	−0.086* (0.047)	−0.086 (0.096)	0.536*** (0.006)	−0.226** (0.096)	−0.226** (0.096)
<i>Lev</i>	0.008 (0.015)	0.008 (0.016)	0.041*** (0.003)	−0.004 (0.016)	−0.004 (0.016)
<i>EBITDA/TA</i>	−0.450*** (0.051)	−0.450*** (0.052)	−0.002 (0.003)	−0.452*** (0.052)	−0.452*** (0.052)
<i>DIV_Dummy</i>	0.013 (0.019)	0.013 (0.019)		0.009 (0.019)	0.009 (0.019)
<i>MinorInterest</i>			0.170*** (0.009)		
<i>InverseMillsRatio</i>				−0.430 (0.325)	−0.43 (0.325)
<i>EmpLaw</i>	0.722*** (0.017)		0.166*** (0.062)	0.670*** (0.044)	
<i>UnionPower</i>		0.465*** (0.012)			0.432*** (0.028)
<i>ShareholderLaw</i>	0.053*** (0.009)	0.132*** (0.022)	0.124*** (0.011)	0.086*** (0.022)	0.086*** (0.033)
<i>N</i>	165,287	165,287	165,287	165,287	165,287
<i>Log-Likelihood</i>	−36,119.92	−36,119.92		−36,116.76	−36,116.76
<i>AIC</i>	72,351.83	72,351.83		72,347.52	72,347.52

This table presents the logistic regressions where the probability of experiencing performance shock is modeled as function of firm- and country-level characteristics (models 1–2) and the Heckman self-selection models where diversification status is modeled as a probit in the first stage and the probability of experiencing performance shock is modeled in the second stage (models 3–4). All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 4
Summary statistics for firms around the performance shocks.

	Mean			Median		
	<i>t-1</i>	<i>t</i> (Shock Year)	<i>t + 1</i>	<i>t-1</i>	<i>t</i> (Shock Year)	<i>t + 1</i>
<i>Size</i>	14.615	14.545	14.524*	14.333	14.286	14.240*
<i>EBITDA</i>	13,041,445	2,031,755***	5,188,610***	241,980	10,107***	43,791***
<i>Lev</i>	0.211	0.235***	0.232***	0.178	0.204***	0.198***
<i>MB</i>	0.985	0.785***	0.804***	0.638	0.503***	0.525***
<i>EBITDA/TA</i>	0.158	−0.004***	0.039***	0.134	0.025***	0.059***
<i>Labor</i>	3390	3222	3111**	687	664	646***
<i>DIV_Dum</i>	0.496	0.501	0.512**	0	1	1**
<i>NumSeg</i>	1.738	1.755	1.788**	1	2	2***
	From <i>t-1</i> to <i>t + 1</i>					
<i>Downsizing5</i>	0.456					
<i>Downsizing20</i>	0.200					

This table displays the characteristics of firms that experience performance shocks. The difference in the means between the statistics for year (*t*) or year (*t + 1*) compared to year (*t-1*) is indicated by ***, **, and * for significance at the 1%, 5%, and 10% level, respectively.

the labor union power and the protection of workers during collective disputes. Both are from Botero et al. (2004). We control for the shareholders protection laws, *ShareholderLaw*, obtained from Djankov et al. (2008).⁷

⁷ The *ShareholderLaw* index, which as in Atanassov and Kim (2009), is the sum of the normalized values of the Anti-director and the Anti-self-dealing indexes. This index measures the stance of corporate laws towards shareholder protection and the legal protection of minority shareholders against expropriation by corporate insiders. Our results are similar when we use the Anti-director index only. Downsizing could be related to resources and access to capital markets, it would be ideal to control for these factors using firm-level proxies. However there is no reliable data available for our cross-country sample. Leverage could be important in explaining firm's downside decisions. We address this concern by controlling for country-level legal protection for creditors in our robustness checks. In particular, we replace *ShareholderLaw* with the creditor right index (Djankov et al., 2008). The results (not reported for brevity) are similar to with the results using the *ShareholderLaw* index.

4. Empirical results

4.1. Diversification and performance shocks

We start by examining whether diversified firms are more likely to experience a performance shock than single-segment firms using the full sample of 165,287 firm-year observations. The results of the logistic regressions are reported in Table 3. All models include country and year fixed-effects, and standard errors are clustered by country and robust to heteroscedasticity.

The coefficient of *DIV_Dummy* (columns 1–2) is insignificant, indicating that the diversification status is not related to the likelihood of facing a major performance shock. To address the concern that our estimation may suffer from the endogeneity problem which arises when firms self-select into the diversification status and this selection bias may affect the probability of experiencing shocks, we correct for the self-selection bias using the Heckman two-stage procedure in the same manner as in Campa and Kedia (2002). In the first stage, we use a probit model for the diversification status in which the exclusion restriction is *MinorInterest*, an indicator for whether the firm reports a non-zero

Table 5
Downsizing and corporate diversification – The role of employment protection laws.

Diversification measure	Downsizing5		Downsizing20	
	[1]	[2]	[3]	[4]
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
<i>Size</i>	0.062 (0.061)	0.056 (0.054)	-0.145** (0.060)	-0.145** (0.060)
<i>Lev</i>	0.287 (0.218)	0.278 (0.205)	0.264 (0.304)	0.266 (0.299)
<i>MB</i>	-0.412*** (0.040)	-0.415*** (0.039)	-0.329*** (0.059)	-0.330*** (0.058)
<i>EBITDA/TA</i>	-2.248*** (0.201)	-2.243*** (0.203)	-2.411*** (0.220)	-2.407*** (0.220)
<i>Diversification</i>	0.663** (0.295)	0.423** (0.190)	0.539* (0.253)	0.459** (0.146)
<i>InverseMillsRatio</i>	0.573 (0.600)	0.501 (0.579)	-0.706 (0.523)	-0.694 (0.532)
<i>EmpLaw</i>	-3.814*** (0.452)	-3.631*** (0.457)	-3.306*** (0.504)	-3.281*** (0.520)
<i>ShareholderLaw</i>	0.279*** (0.072)	0.351*** (0.102)	0.139 (0.082)	0.135 (0.086)
<i>Diversification* EmpLaw</i>	-0.608 (0.242)	-0.374*** (0.128)	-0.277 (0.172)	-0.222 (0.152)
<i>Diversification* ShareholderLaw</i>	-0.076 (0.092)	-0.065 (0.048)	-0.084** (0.031)	-0.085*** (0.031)
<i>N</i>	8160	8160	8160	8160
<i>Log-Likelihood</i>	-5330.47	-5331.65	-3730.23	-3729.51
<i>AIC</i>	10,774.93	10,777.30	7574.46	7573.02

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% of the workforce (models 1–2) and at least 20% (models 3–4) is modeled in the second stage. The country-level variable of interest is *EmpLaw* which measures the rigidity of employment laws (i.e. alternative employment contracts, cost of increasing hours worked, cost of firing workers, dismissal procedures) from Botero et al. (2004). All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

amount for the minority interest on its balance sheet. This variable satisfies the requirement of the Heckman selection approach for a variable that can be included in the first stage but can be excluded from the second-stage based on the assumption that it is uncorrelated with the outcome (Kuppuswamy et al., 2014). The results here confirm that neither the diversification status nor the unobserved firm characteristics which cause firms to diversify is related to the likelihood of a performance shock.

4.2. Downsizing following performance shocks

Table 4 displays the means and medians of firm-level variables for the three years around the performance shocks. Firms' total assets, earnings, market-to-book value, operating performance and number of employees all drop significantly while leverage increases from the year before the shock ($t-1$) to the shock year and the year after (t and $t+1$).

We test whether the likelihood of downsizing is higher in diversified firms using logistic regressions controlling for firm-specific factors and country-level legal protections of workers and shareholders. To account for the selection of firms into the diversification status and that this selection bias may affect employment decisions of diversified firms, we use the Heckman two-stage selection model (Heckman, 1979) with the first stage being reported in Table 3 and the second stage including the Inverse Mills ratio obtained from the first stage. Results of the second stage are displayed in Tables 5 and 6 where the national employment protection laws *EmpLaw* are included in Table 5 and the national union

Table 6
Downsizing and corporate diversification – The role of union power.

Diversification measure	Downsizing5		Downsizing20	
	[1]	[2]	[3]	[4]
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
<i>Size</i>	0.070 (0.063)	0.065 (0.054)	-0.142** (0.060)	-0.134** (0.062)
<i>Lev</i>	0.295 (0.220)	0.290 (0.207)	0.268 (0.306)	0.278 (0.303)
<i>MB</i>	-0.413*** (0.039)	-0.415*** (0.039)	-0.329*** (0.059)	-0.330*** (0.058)
<i>EBITDA/TA</i>	-2.263*** (0.203)	-2.246*** (0.201)	-2.421*** (0.220)	-2.415*** (0.219)
<i>Diversification</i>	0.595** (0.217)	0.221 (0.152)	0.703*** (0.262)	0.395** (0.132)
<i>InverseMillsRatio</i>	0.648 (0.616)	0.587 (0.574)	-0.660 (0.522)	-0.608 (0.541)
<i>UnionPower</i>	-2.349*** (0.346)	-2.577*** (0.577)	-2.198*** (0.357)	-1.962*** (0.524)
<i>ShareholderLaw</i>	0.035 (0.074)	0.064 (0.093)	-0.170** (0.079)	-0.107 (0.096)
<i>Diversification* UnionPower</i>	-0.936 (0.365)	-0.152 (0.268)	-0.742** (0.330)	-0.345* (0.196)
<i>Diversification* ShareholderLaw</i>	-0.014 (0.071)	-0.027 (0.048)	-0.076 (0.059)	-0.055** (0.023)
<i>N</i>	8160	8160	8160	8160
<i>Log-Likelihood</i>	-5328.54	-5335.11	-3729.62	-3729.87
<i>AIC</i>	10,771.09	10,784.23	7573.23	7573.75

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% of the workforce (models 1–2) and at least 20% (models 3–4) is modeled in the second stage. The country-level variable of interest is *UnionPower* which measures the protection of collective relations laws (i.e. labor union power, collective dispute) from Botero et al. (2004). All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

power and collection relations laws *UnionPower* are included in Table 6. In all models in both tables, the statistically insignificant coefficients of *InverseMillsRatio* indicate that unobserved characteristics which make firms choose to diversify are not related to firms' decision to downsize. All models include country and year fixed-effects, and we report standard errors clustered by country and robust to heteroscedasticity.

Table 5 shows that the coefficients of both measures of diversification, *DIV_Dummy* and *NumSeg*, are positive and statistically significant in all regressions. Our results provide strong support for hypothesis 2 that diversified firms are more likely to downsize when the management of these firms attempt to reduce previous inefficient resource allocation. We also find that larger firms, firms with higher market-to-book value and more profitable firms are less likely to downsize although the impact of size is only significant in the case of large downsizing. This is in line with existing studies that firms with more resources and better access to external capital markets are less likely to downsize (Atanassov & Kim, 2009; Benmelech, Bergman, & Seru, 2011; Datta et al., 2010). The coefficient of *EmpLaw* is negative and statistically significant in all models while the coefficients of its interaction with diversification measures are also negative but significant in only one model. This is consistent with previous research that high adjustment costs in countries with rigid employment laws deter firms from downsizing (see e.g. Lafontaine & Sivadasan, 2009). Our findings provide some support for hypothesis 4 that stringent employment protection laws lessening the inefficient internal market effect, resulting in a net negative impact on the positive relation between downsizing and diversification.

Table 6 displays the results of the estimation in which we focus on the national union power and collection relations laws *UnionPower*. We

Table 7
Diversification and excess employment.

	[1]	[2]
<i>Size</i>	-0.081*** (0.007)	-0.082*** (0.007)
<i>Lev</i>	0.090*** (0.015)	0.090*** (0.015)
<i>MB</i>	-0.005** (0.002)	-0.005** (0.002)
<i>EBITDA/TA</i>	-0.648*** (0.020)	-0.648*** (0.020)
<i>DIV_Dummy</i>	0.114*** (0.034)	0.126*** (0.031)
<i>InverseMillsRatio</i>	-0.023 (0.052)	-0.023 (0.052)
<i>EmpLaw</i>	-0.479 (0.319)	
<i>UnionPower</i>		-0.321 (0.218)
<i>ShareholderLaw</i>	-0.047*** (0.013)	-0.074*** (0.011)
<i>DIV_Dummy * EmpLaw</i>	0.031 (0.044)	
<i>DIV_Dummy * UnionPower</i>		-0.019 (0.042)
<i>DIV_Dummy * ShareholderLaw</i>	-0.034*** (0.008)	-0.032*** (0.010)
<i>N</i>	70,374	70,374
<i>Ajd-R²</i>	0.070	0.070

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and excess employment is modeled in the second stage. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

still find that diversified firms are more likely to downsize – the coefficients of *DIV_Dummy* and *NumSeg* remain positive and significant. The negative and significant coefficients of *UnionPower* and its interaction with diversification in the case of large downsizing support our hypothesis 4 that stringent laws in the form of strong union power laws not only deter firms from cutting jobs but also weaken the inefficient internal market effect. There is no clear evidence on the impact of shareholder rights laws, which could be because downsizing may be sub-optimal when the nature and scale of shocks are still ambiguous.

4.3. Excess employment, downsizing decisions and post-shock performance

In this section, we measure excess employment of diversified firms in relation to that of comparable single-segment firms and model excess employment as a function of firm- and country- characteristics. Due to data availability we can calculate excess employment for 70,374 firm-years (with and without performance shock). Table 7 displays the second-stage Heckman-selection regressions to control for the self-selection bias induced on account of firm’s choosing to diversify. The positive and statistically significant coefficients of the diversification dummy *DIV_Dummy* in both models suggest that diversified firms have more excess employment than single-segment firms. Furthermore, the interaction term between *DIV_Dummy* and the shareholder protection laws is negative and statistically significant in both models. This suggests that a lack of market scrutiny and high monitoring costs associated with weaker shareholder protection laws (see e.g. Morellec, Nikolov, & Schurhoff, 2018) might also contribute to diversified firms maintaining excess employment.

We repeat the analysis of the likelihood of downsizing using *Excess_Emp* instead of using *DIV_Dummy* or *NumSeg*. Due to data availability,

Table 8
Downsizing and excess employment.

	Downsizing5		Downsizing20	
	[1]	[2]	[3]	[4]
<i>Size</i>	0.031 (0.062)	0.032 (0.062)	-0.195** (0.078)	-0.195** (0.077)
<i>Lev</i>	0.178 (0.280)	0.177 (0.281)	0.209 (0.359)	0.205 (0.359)
<i>MB</i>	-0.431*** (0.038)	-0.431*** (0.039)	-0.340*** (0.073)	-0.339*** (0.073)
<i>EBITDA/TA</i>	-2.267*** (0.176)	-2.275*** (0.179)	-2.449*** (0.182)	-2.459*** (0.189)
<i>Excess_Emp</i>	0.456** (0.210)	0.414** (0.204)	0.532** (0.266)	0.537* (0.290)
<i>InverseMillsRatio</i>	0.163 (0.578)	0.160 (0.572)	-1.190** (0.593)	-1.194** (0.591)
<i>EmpLaw</i>	-5.131*** (0.445)		-4.812*** (0.420)	
<i>UnionPower</i>		-3.481*** (0.301)		-3.261*** (0.286)
<i>ShareholderLaw</i>	0.226*** (0.052)	-0.066 (0.073)	-0.011 (0.068)	-0.288*** (0.088)
<i>Excess_Emp * EmpLaw</i>	-0.176 (0.168)		-0.166 (0.241)	
<i>Excess_Emp * UnionPower</i>		-0.333** (0.167)		-0.434** (0.190)
<i>Excess_Emp * ShareholderLaw</i>	-0.065 (0.052)	-0.031 (0.049)	-0.085 (0.056)	-0.055 (0.054)
<i>N</i>	5816	5816	5816	5816
<i>Log-Likelihood</i>	-3746.75	-3745.49	-2654.33	-2652.82
<i>AIC</i>	7599.49	7596.98	5414.65	5411.64

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% of the workforce (models 1–2) and at least 20% (models 3–4) is modeled in the second stage. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 9
Change in excess employment and diversification level in diversified firms following the performance shocks.

	Downsizing5 = 1	Downsizing5 = 0	Downsizing20 = 1	Downsizing20 = 0
<i>Excess_Emp</i>				
<i>t-1</i>	0.467	0.356	0.427	0.403
<i>t + 1</i>	0.461	0.497***	0.335***	0.514***
<i>NumSeg</i>				
<i>t-1</i>	2.624	2.589	2.572	2.613
<i>t + 1</i>	2.618	2.695*	2.496**	2.696*

This table compares excess employment and diversification levels of diversified firms in the pre-shock year with that of the post-shock year. The statistical significance of the differences are indicated by ***, **, and * for significance at the 1%, 5%, and 10% level, respectively.

we have a reduced sample of 5816 observations of firms experiencing major adverse shocks. We use the pre-shock excess employment, i.e. measured at year (*t-1*) in the estimation. Table 8 reports results of the second-stage Heckman-selection regressions, with columns 1 and 2 reporting results with *Downsizing5* and columns 3 and 4 reporting results with *Downsizing20*. Results in Table 8 are very similar to those reported in Tables 5 and 6. The coefficients of *Excess_Emp* are positive and

Table 10
Sensitivity to alternate measure of diversification.

Panel A: Alternative measures of diversification based on 3-digit SIC codes				
	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.693** (0.344)	0.494** (0.166)	0.607** (0.282)	0.527*** (0.152)
Diversification * <i>EmpLaw</i>	-0.609 (0.271)	-0.372** (0.125)	-0.144 (0.249)	-0.231 (0.153)
All other variables	Yes	Yes	Yes	Yes
N	8160	8160	8160	8160
Log-Likelihood	-5335.42	-5336.37	-3734.58	-3732.27
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.604** (0.235)	0.288* (0.144)	0.736*** (0.275)	0.498*** (0.146)
Diversification * <i>UnionPower</i>	-0.941 (0.468)	-0.172 (0.251)	-0.729** (0.360)	-0.365** (0.166)
All other variables	Yes	Yes	Yes	Yes
N	8160	8160	8160	8160
Log-Likelihood	-5333.42	-5339.94	-3733.10	-3731.24

Panel B: Alternative measures of diversification based on segment assets				
	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.518 (0.319)	0.157 (0.180)	0.756*** (0.213)	0.420*** (0.153)
Diversification * <i>EmpLaw</i>	0.298 (0.315)	0.098 (0.158)	-0.113 (0.352)	-0.282 (0.190)
All other variables	Yes	Yes	Yes	Yes
N	7297	7297	7297	7297
Log-Likelihood	-4742.12	-4744.22	-3271.43	-3271.22
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.733*** (0.281)	0.219 (0.162)	0.748*** (0.167)	0.277*** (0.099)
Diversification * <i>UnionPower</i>	-0.402 (0.418)	-0.035 (0.227)	-0.283 (0.268)	-0.059 (0.143)
All other variables	Yes	Yes	Yes	Yes
N	7297	7297	7297	7297
Log-Likelihood	-4741.86	-4744.34	-3271.30	-3271.99

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage. Results in Panel A are for measures of diversification based on three-digit SIC codes and in Panel B are for measures of diversification based on segment assets. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

statistically significant in all models. This is not only consistent with results reported before, it provides support for our hypothesis 3 that diversified firms with pre-shock inefficient internal market, as evidenced by the existence of more excess employment, are more likely to downsize.⁸

Next we compare excess employment and the level of diversification of diversified firms before and after the major shocks. Table 9 shows that only diversified firms that cut at least 20% of the workforce reduce excess employment following shocks. Those choose not to downsize, on the contrary, have even higher excess employment compared to the pre-

⁸ It is quite possible that excess employment might not always indicate inefficiency, most notably if diversified firms genuinely need more employees owing to the variety of their operations. Yet, the presence of excess employment and employment reduction following performance shocks that we report here appears more in line with the existing evidence of ‘diversification discount’ and inefficient internal capital market (Kuppuswamy et al., 2014; Ozbas & Scharfstein, 2010).

Table 11
Sensitivity to alternate measure of performance shocks.

	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.629** (0.281)	0.391*** (0.149)	0.354 (0.220)	0.325** (0.134)
Diversification * <i>EmpLaw</i>	-0.296 (0.242)	-0.207* (0.103)	0.104 (0.299)	-0.121 (0.147)
All other variables	Yes	Yes	Yes	Yes
N	13,924	13,924	13,924	13,924
Log-Likelihood	-8899.50	-8896.59	-5535.10	-5535.10
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.673*** (0.258)	0.305*** (0.130)	0.589** (0.289)	0.371** (0.150)
Diversification * <i>UnionPower</i>	-0.756 (0.351)	-0.165 (0.171)	-0.683** (0.290)	-0.366*** (0.137)
All other variables	Yes	Yes	Yes	Yes
N	13,924	13,924	13,924	13,924
Log-Likelihood	-8895.84	-8897.82	-5533.25	-5531.99

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage. The performance shocks are defined at the 30% level. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

shock period. We also compare the number of reported segments before and after performance shocks. It is possible that performance shock in a diversified firm is due to poor performance of only certain segments and hence the firm might close or merge those non-performing segments with other segments. Although there is no data available to accurately attribute firm-level shock to certain segments, results in Table 9 indicate that diversified firms that downsize at least 20% of workforce report fewer segments (though the change in *NumSeg* seems economically small). This is consistent with Hillier et al. (2007)’s finding that downsizing results in corporate focus.

4.4. Sensitivity to alternate measures and sampling methods

We conduct a comprehensive range of robustness checks. For brevity, we report the coefficients of different diversification measures and their interactions with national settings only and we use this reporting practice for all the tables in this section. Table 10 presents the results of analysis where we use alternate measures of diversification based on three-digit SIC codes to ensure that we do not overestimate the scale of diversification (Panel A) and based on segment assets to ensure that our results are not driven by segment sales reporting (Panel B). Table 11 presents the results of analysis using the sample where shocks are defined as decline in operating performance of at least 30% compared to previous year’s level. While the use of diversification measures based on segment assets results in a reduced sample due to data availability (Panel B Table 10), the use of the 30% threshold for performance shocks as an alternate sampling method results in a substantial increase in sample size of 70% (Table 11) compared to when we use the 50% threshold (Tables 5 and 6). Yet results in both tables 10 and 11 are consistent with our previously reported findings. The coefficients of diversification measures remain positive and highly significant.

We perform analysis with several other alternate sampling methods. We exclude firms that downsize at least 5% of the workforce (to be consistent with our measure of employment downsizing) in at least one year in the period of three years prior to the major performance shocks. This is to check if our results are driven by the possibility that employment downsize following shocks might be a part of a planned scaling down of operations and employment in the years prior to the shock. This results in a reduction in the number of observations. Results in Panel A Table 12 show that our main findings remain unchanged.

Table 12

Sensitivity to alternate sampling methods – Exclude firms with existing downsizing schemes or firms with major asset disposal.

Panel A: Alternative sampling method - Exclude firms with employment downsizing prior to performance shock				
	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.837** (0.338)	0.485*** (0.185)	0.582** (0.243)	0.520*** (0.138)
Diversification * <i>EmpLaw</i>	-0.827 (0.305)	-0.441*** (0.128)	-0.189 (0.337)	-0.304* (0.162)
All other variables	Yes	Yes	Yes	Yes
N	6749	6749	6749	6749
Log-Likelihood	-4392.00	-4392.81	-3053.64	-3052.55
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.736*** (0.235)	0.256* (0.156)	0.740*** (0.230)	0.446*** (0.105)
Diversification * <i>UnionPower</i>	-1.274 (0.365)	-0.241 (0.268)	-0.928*** (0.276)	-0.407** (0.169)
All other variables	Yes	Yes	Yes	Yes
N	6749	6749	6749	6749
Log-Likelihood	-4389.09	-4396.19	-3051.76	-3051.93

Panel B: Alternative sampling method – Exclude firms with major asset disposal				
	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.590** (0.260)	0.390** (0.180)	0.590*** (0.220)	0.490*** (0.140)
Diversification * <i>EmpLaw</i>	-0.610 (0.250)	-0.380*** (0.140)	-0.120 (0.330)	-0.310* (0.180)
All other variables	Yes	Yes	Yes	Yes
N	8038	8038	8038	8038
Log-Likelihood	-5247.00	-5248.00	-3639.00	-3638.00
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.480** (0.210)	0.160 (0.160)	0.700*** (0.210)	0.400*** (0.110)
Diversification * <i>UnionPower</i>	-0.810 (0.360)	-0.100 (0.270)	-0.600** (0.260)	-0.330* (0.180)
All other variables	Yes	Yes	Yes	Yes
N	8038	8038	8038	8038
Log-Likelihood	-5246.00	-5251.00	-3638.00	-3638.00

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage. Results in Panel A are for the sample excluding firms with downsizing schemes in place before performance shocks and in Panel B are the sample excluding firms with major asset disposal. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

To address the concern that our main findings could be due to firms that cut jobs as part of major divestments/ asset disposal, we identify firms that report the value of asset disposal in year ($t + 1$) of at least 15% of total assets in year ($t-1$) and exclude these firms from our sample. Not only that there are very few firms engaging in major divestments following adverse performance shocks, the results in Panel B Table 12 also show that our key findings are unaffected once we remove these firms from our sample.

Our next alternate sampling method is where we exclude firms that experience sales decline prior to the performance shock. This is to address the concern that firms might experience prolonged decline prior to the major performance shock and this could represent a source of endogeneity. To ensure the rigor of our filtering, we define a sales decline as a drop of at least 20% in earnings (rather than 50% as in our definition of a sudden and sharp performance decline) and a firm that might experience prolonged decline as those having at least two sales decline of 20% in the period of five years prior to the shock. We then

Table 13

Sensitivity to alternate sampling method – Exclude firms with declining sales.

	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.631*** (0.243)	0.412** (0.160)	0.142 (0.190)	0.330*** (0.102)
Diversification * <i>EmpLaw</i>	-0.684 (0.280)	-0.484*** (0.160)	-0.096 (0.271)	-0.422*** (0.118)
All other variables	Yes	Yes	Yes	Yes
N	6159	6159	6159	6159
Log-Likelihood	-3996.03	-3995.75	-2745.65	-2744.92
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.527*** (0.168)	0.124 (0.161)	0.249* (0.139)	0.147 (0.126)
Diversification * <i>UnionPower</i>	-0.912 (0.335)	-0.079 (0.266)	-0.527** (0.254)	-0.173 (0.212)
All other variables	Yes	Yes	Yes	Yes
N	6159	6159	6159	6159
Log-Likelihood	-3995.15	-4000.79	-2745.10	-2746.91

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage. Results are for the sample excluding firms that might experience prolonged declines. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 14

Sensitivity to alternate sampling method – Exclude industries with declining sales.

	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.671** (0.304)	0.411** (0.183)	0.832*** (0.273)	0.518*** (0.182)
Diversification * <i>EmpLaw</i>	-0.666 (0.338)	-0.346** (0.135)	-0.114 (0.269)	-0.209 (0.197)
All other variables	Yes	Yes	Yes	Yes
N	6481	6481	6481	6481
Log-Likelihood	-4233.91	-4236.29	-2934.64	-2932.22
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
Diversification	0.545** (0.227)	0.217 (0.147)	0.976*** (0.287)	0.476*** (0.151)
Diversification * <i>UnionPower</i>	-0.829 (0.404)	-0.139 (0.257)	-0.706** (0.286)	-0.298* (0.180)
All other variables	Yes	Yes	Yes	Yes
N	6481	6481	6481	6481
Log-Likelihood	-4233.42	-4238.61	-2933.54	-2933.81

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage. Results are for the sample excluding firms that belong to industries with declining sales. All models include country and year fixed effects. All variables are defined in Table 1. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

perform the analysis on the sample that excludes firms that might experience prolonged declines. The results in Table 13 are largely similar to those reported previously.

The final alternate sampling method is where we exclude firms in industries with declining sales. We utilize the available data for all firms (with and without performance shocks) to measure industry decline and define an industry-level decline as a drop in total industry sales by at least 20% compared to the previous year. We use three-digit SIC codes to define industries. Next, we exclude firms in industries with sales decline

Table 15
Robustness Check: Controlling for finance crisis periods.

	Probability of Shock	Downsizing5		Downsizing20	
	[1]	[2]	[3]	[4]	[5]
	<i>DIV_Dummy</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
<i>Diversification</i>	-0.031 (0.034)	0.531** (0.259)	0.368* (0.194)	0.549** (0.246)	0.466*** (0.148)
<i>InverseMillsRatio</i>	0.035 (0.356)	0.604 (0.574)	0.576 (0.541)	-0.706 (0.475)	-0.702 (0.488)
<i>Diversification*EmpLaw</i>		-0.600 (0.239)	-0.382*** (0.139)	-0.07 (0.327)	-0.275 (0.167)
<i>Diversification*Crisis97</i>	0.248 (0.223)	0.132 (0.394)	0.206 (0.355)	0.305* (0.178)	0.371** (0.158)
<i>Diversification*Crisis08</i>	0.010 (0.057)	0.299 (0.149)	0.354** (0.149)	-0.109 (0.144)	-0.045 (0.121)
All other variables	Yes	Yes	Yes	Yes	Yes
N	165,129	8160	8160	8160	8160
Log-Likelihood	-31,588.87	-5357.82	-5356.74	-3754.21	-3753.33
	<i>DIV_Dummy</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
<i>Diversification</i>	-0.031 (0.034)	0.436* (0.246)	0.145 (0.167)	0.706*** (0.271)	0.407*** (0.144)
<i>InverseMillsRatio</i>	0.035 (0.356)	0.678 (0.584)	0.635 (0.533)	-0.672 (0.484)	-0.607 (0.505)
<i>Diversification*UnionPower</i>		-0.833** (0.400)	-0.088 (0.284)	-0.704** (0.309)	-0.351* (0.201)
<i>Diversification*Crisis97</i>	0.248 (0.223)	0.165 (0.416)	0.207 (0.368)	0.304 (0.193)	0.356** (0.164)
<i>Diversification*Crisis08</i>	0.010 (0.057)	0.298 (0.151)	0.339** (0.152)	-0.108 (0.144)	-0.058 (0.128)
All other variables	Yes	Yes	Yes	Yes	Yes
N	165,129	8160	8160	8160	8160
Log-Likelihood	-31,588.87	-5356.67	-5360.77	-3752.79	-3752.90

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) (model 1) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage (models 2–5). All models include country fixed effects. Financial crisis indicators for the 1997 (the years 1997 and 1998) and 2008 (the years 2008 and 2009) crises are included. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 16
Robustness Check: Controlling for quality of law enforcement.

	Downsizing5		Downsizing20	
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
<i>Diversification</i>	0.663** (0.295)	0.423** (0.190)	0.539** (0.253)	0.459*** (0.146)
<i>Diversification*EmpLaw</i>	-0.608 (0.242)	-0.374*** (0.128)	-0.082 (0.332)	-0.277 (0.172)
All other variables	Yes	Yes	Yes	Yes
N	8160	8160	8160	8160
Log-Likelihood	-5330.47	-5331.65	-3730.23	-3729.51
	<i>DIV_Dummy</i>	<i>NumSeg</i>	<i>DIV_Dummy</i>	<i>NumSeg</i>
<i>Diversification</i>	0.595*** (0.217)	0.221 (0.152)	0.703*** (0.262)	0.395*** (0.132)
<i>Diversification*UnionPower</i>	-0.936 (0.365)	-0.152 (0.268)	-0.345* (0.196)	-0.345* (0.196)
All other variables	Yes	Yes	Yes	Yes
N	8160	8160	8160	8160
Log-Likelihood	-5328.54	-5335.11	-3729.62	-3729.87

This table presents the Heckman self-selection models where diversification status is modeled as a probit in the first stage (reported in Table 3) (model 1) and the probability of cutting at least 5% or 20% of the workforce is modeled in the second stage (models 2–5). The additional control variable is quality of law enforcement proxied by the length of court proceedings in collecting a bounced check and evicting a tenant from Botero et al. (2004). All models include country and year fixed effects. The robust standard errors clustered by country are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

from our sample. Diversified firms are excluded if the segments with largest sales are in the declining industries. Results of the estimation reported in Table 14 clearly indicate that for firms operating in industries that do not experience any sales decline, performance shocks are likely to be attributed to firm-level failure. Further, the results regarding the impact of corporate diversification on employment downsizing remain unchanged.

We conduct additional checks. To account for the possibility that performance shocks and employment downsizing are more common during the period of market shocks, we include two indicator variables

for the financial crises of 1997–1998 and 2008–2009, both on their own and as interaction with diversification variables. We re-estimate the regressions examining whether diversified firms are more likely to experience performance shock than single-segment firms. We find that only the 2008–2009 financial crisis is associated with higher probability of firms having performance shock. However, we do not find that diversified firms are more likely to experience performance shock during the crisis periods than single-segment firms. We then re-estimate the regressions examining the likelihood of employment downsizing among firms with performance shocks. We find some evidence, although not

always statistically significant, that diversified firms experiencing performance shocks are more likely to downsize during the crisis periods than in non-crisis periods. In another check, in addition to employment and shareholder protection laws, we also control for the quality of law enforcement, proxied by the length of court proceedings in collecting a bounced check and evicting a tenant as in Botero et al. (2004). The key results of these checks, reported in Tables 15 and 16, are very similar to the main results.

5. Conclusions

We propose and test two competing hypotheses regarding the role of corporate diversification in the downsizing decisions of firms that witness sudden and adverse shocks. Using a large cross-country dataset, we find that diversified firms are more likely to cut jobs in response to major adverse shocks. Our analysis provides strong support for the inefficient internal market hypothesis, i.e. diversified firms have excess employment and major adverse shocks prompt these firms to reduce inefficiency via downsizing. Our results are also consistent with the two-tiered agency model described in Scharfstein and Stein (2000) in which behavior of rent-seeking divisional managers could lead to inefficient investment and higher agency problems (between headquarter and segment managers and between firm management and outside investors), and higher monitoring costs for outside investors (see also Morellec et al., 2018). Our results are robust to the self-selection bias, which takes into account the fact that the selection of firms into the diversification status is not pursued randomly. Our results withstand comprehensive robustness checks.

We also document that diversified firms have more employment than the sum of employment if each of the segments operated as single-segment firms. This raises the challenging question as to whether job losses are likely to take place in under-performing segments, or whether the refocus partially reflects other strategic or organizational-political imperatives? This goes beyond the scope of this study as data on segment-level employment are not available, especially in a multi-country context. This problem is further exacerbated by discretion in segment reporting in the current accounting.⁹ Nonetheless, this would represent an important issue for future research, when more relevant internal firm-level data becomes available.

We find that significant employment downsizing seems to reduce excess employment in diversified firms in the aftermath of a major performance shock. This raises some important questions, as to how long do the benefits of undertaking downsizing last, and what are the longer-term consequences of a loss of organization-specific skills and the weakening of incentives on employees to develop their organization-specific human capital. As the benefits of smaller scale downsizing are not as significant as that of large-scale downsizing, it might be that those firms that refrain from shedding jobs may, over time, recover by other means, whilst retaining the advantages of firm-specific skills and capabilities. We also find that stringent employment rights laws and union power clearly exert a cost in terms of weakening firms' flexibility in their employment decisions.

Declaration of Competing Interest

None. This manuscript is original. No part of the manuscript has been published before, nor is any part of it under consideration for publication at another journal. We have no conflicts of interest to disclose.

⁹ Studies on corporate diversification in an international context such as Kuppusswamy et al. (2014) and Faccio and O'Brien (2021) use data from the same source like ours, i.e. Worldscope. Information about international accounting practices for segment reporting can be found at <https://www.pwc.com/gx/en/ifrs-reporting/pdf/segment-reporting.pdf> and https://www.fasb.org/jsp/FASB/FASBContent_C/ProjectUpdateExpandPage&cid=1176170647220.

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