How Centralization Affects Resource Redeployment in Brazilian Manufacturing

July 29, 2023

PRELIMINARY AND INCOMPLETE DRAFT

Jasmina Chauvin,[1] Christopher W Poliquin,[2] and Timothy B Folta[3]

[1] Georgetown University
[2] University of California of Los Angeles
[3] University of Connecticut

Abstract

We examine the role of organizational structure in determining resource redeployment decisions for multi-business firms. Redeployment potential has garnered considerable attention in recent research, but lacking is an understanding of how structure affects this potential. We study one element of structure—whether decision-making authority is centralized or decentralized—in the context of human capital redeployment within Brazilian manufacturing firms. Our empirical effort is facilitated by exploiting a quasi-natural experiment around an export shock. We find that firms with more centralized hiring authority redeploy more workers.

1 INTRODUCTION

Recent work in corporate strategy suggests having the flexibility to redeploy resources across businesses is a potential source of corporate advantage (Dickler, Folta, Giarratana, and Santalo, 2022). Considerable attention has been devoted to the determinants affecting the value of redeployment potential, such as redeployment costs (e.g., Helfat and Eisenhardt, 2004; Sakhartov and Folta, 2014; Dickler and Folta, 2020); inducements to redeploy (e.g., Sakhartov and Folta, 2015; Dickler and Folta, 2020); external market frictions (e.g., Belenzon and Tsolman, 2016; Sohl and Folta, 2020; Giarratana and Santalo, 2020); and redeployment experience (Dickler, et al., 2022). Missing is an understanding of how firm structure influences the inclination or ability to redeploy. This is a paradox, given that Helfat and Eisenhardt (2004) revitalized an interest in redeployment, and they devote considerable attention to the importance of structure and incentives, predicting that decentralization might be optimal for firms pursing corporate advantage through redeployment potential. To date, there has been no empirical examination of how redeployment potential is affected by organizational structure. This is the purpose of this paper.

Our specific focus is on how redeployment is affected by centralized or decentralized decision-making, a fundamental element of corporate structure. In this sense, we build upon a vast literature emphasizing the important role of structure in facilitating corporate strategy (e.g., Chandler, 1962; Williamson, 1975, 1991; Hill et al., 1992; Rawley, 2010). It is not obvious how centralization should affect redeployment. Centralized decision-making (i.e., within corporate headquarters) might be required when coordination across businesses is needed, such as around market entry or exit decisions often accompanying resource redeployment. At the same time, coordination is costly and may outweigh any flexibility advantages enabling firms to effectively adapt (Rawley, 2010; Chen, Kaul, and Wu, 2019). Multi-business firms therefore face tradeoffs related to organizational design and redeployment strategies.

We empirically examine how centralized decision-making affects firm decisions to redeploy. To investigate, we combine a large survey of management practices in Brazilian manufacturing firms with employer-employee matched data on job assignments. This data enables us to identify whether employees were redeployed across firm establishments, whether establishments are closed, and the extent to which hiring authority is centralized or decentralized. Finally, we leverage a quasi-natural experiment associated with an export shock to facilitate a causal interpretation of results. Preliminary results suggest that centralized firms are more likely to redeploy workers upon closing a unit.

2 THEORETICAL BACKGROUND

Studies of organizational structure and corporate strategy highlight the superior ability of decentralized firms to adapt to local conditions, and the superior ability of centralized firms to coordinate decisions across units. Empowered managers in decentralized firms enjoy discretion to adapt a firm's resources to environmental conditions in ways that maximize returns. This discretion, however, comes with the potential disadvantage of making locally optimal, but globally suboptimal, decisions when there are opportunities to benefit from coordination across units. Centralization, in contrast, has the advantage of enabling firms to coordinate resource use across businesses to achieve economies of scope. Such coordination, however, entails costs that

potentially constrain the firm's ability to adapt to changes in local, environmental conditions (Chen, Kaul, and Wu, 2019).

An increasingly rich literature on redeployment potential suggests that one way firms adapt to changing conditions is by withdrawing resources from one activity and reallocating them to another with higher returns within the firm. This potential to earn higher returns via redeployment, however, depends both on a firm's ability to recognize and compare opportunities (Levinthal & Wu, 2022), and on adjustment costs, which are the expenses of relocating and adapting resources to a new use (Helfat & Eisenhardt, 2004).

Only two studies that we know of have examined the consequences of structure on resource redeployment.[1] Both of these studies are theoretical. Helfat and Eisenhardt (2004) conjecture that a strategy around redeployment does not require coordination across businesses, so decentralization should economize on coordination costs while benefitting from high-powered incentives and better monitoring. At the same time, they caution (p. 1225) that "firms do require some centralization regarding market entry, exit, and the resulting redeployment of resources, but do not require centralized control of division strategy and operation." Sakhartov and Helfat (2022) develop a formal model and expect that if agency costs are high relative to profit from redeployment potential, decentralization might destroy value. So, there is not a clear theoretical prediction about how centralization affects redeployment.

One potential implication of decentralization is that agency costs arise because managers with discretion to adapt resources as they see fit, may behave in an opportunistic or misguided way. For example, their changes may increase adjustment costs and thus limit future redeployment potential. Moreover, even if managers in decentralized firms have better information about their local environment, they may have incentives to limit the amount and nature of the information they communicate to headquarters, which then affects the ability of the firm to accurately compare alternative uses for resources. Centralized firms, however, can exercise headquarters' authority to limit local adaptation and ensure resources are more applicable across alternative uses, thus lowering adjustment costs. Centralization may also mitigate the problem of managers distorting local information, although in doing so they may also forgo local, managerial expertise and thus receive noisier signals about the business opportunities available to each unit. Finally, centralization should facilitate coordination across business units, which may be especially important when redeployment is accompanied by market entry or exit.

3 DATA AND MEASUREMENT

3.1 Data

We combine data on management practices from the World Management Survey (WMS) with employer-employee matched data on job assignments from the *Relação Anual de Informações Sociais* (RAIS), a mandatory, annual census of all formal-sector employers and their employees in

[1] While Chen, Kaul, and Wu (2019) do not formally study redeployment, they conjecture that attempts to preserve redeployment potential may reduce adaptability of a firm's business units.

Brazil. In doing so, we join survey-based measures of decentralization (Bloom et al., 2010; Van Reenen et al., 2021) to employee-mobility-based measures of resource redeployment (Bodner, 2022; Chauvin, Inoue, and Poliquin, 2023).

3.2 Sample

We construct our sample from the 585 Brazilian firms in the 2008 wave of the World Management Survey. Of these firms, 509 match employment records in RAIS during the years 2008–2014. Our final sample includes these 509 firms and their 1,981 unique establishments with 818,122 unique employees during the 2008–2014 period. Table 1 shows summary statistics and correlations for the firms, establishments, and workers in our sample.

3.3 Decentralization

WMS contains several questions about managerial discretion from which we draw our measure of centralization. Because our focus is human capital redeployment, we rely on questions about managers' discretion to hire employees as our main measure of decentralization and extend our analysis to more holistic measures as a robustness check. Table 2 shows summary statistics and correlations for several components of the holistic decentralization measure, which we sum and normalize to create an overall measure of decentralization with mean 0 and unit standard deviation. Figure 1 shows the distribution of each measure/subcomponent of the holistic measure.

3.4 Redeployment

We measure redeployment as a worker-level indicator for switching employment between establishments of the same firm across consecutive years. We refer to a worker leaving an establishment as *outward redeployment* and a worker joining an establishment as *inward redeployment*; each inward redeployment necessarily has a matching outward redeployment. This distinction allows us to avoid confusion when referring to the circumstances under which workers leave and join units via redeployment.

4 EMPIRICAL APPROACH

Our empirical approach builds on prior studies of the determinants of human capital redeployment in multiunit firms and business groups, which has used the timing of economic shocks—such as booms and recessions (Faccio & O'Brien, 2021), international trade shocks (Belenzon & Tsolmon, 2016; Huneeus et al., 2021), and local demand shocks (Giroud & Mueller, 2019)—and discrete events—such as business closure (Cestone et al., 2020; Tate & Yang, 2015)—to study worker redeployment. An advantage of such settings is that they allow researchers to isolate worker mobility events that reflect *firms'* resource reallocation decisions rather than *worker*-initiated job changes.

We build on these approaches and examine whether centralized or decentralized firms are more likely to redeploy workers following unit closure (Cestone et al., 2020; Tate & Yang, 2015). A potential source of selection bias in this setting, however, is that the decision to close a unit may itself be a function of redeployment capabilities (Lieberman et al., 2017). To address this selection

bias, we implement a two-stage Heckman approach (Heckman, 1979). The approach relies on identifying a variable that affects the firm's decision to close an establishment but (conditional on closure) does not affect the decision whether to redeploy the worker (Wolfolds & Siegel, 2019).

We use a backward-looking measure of industry export growth as an instrument for establishment closure. Specifically, we create a weighted measure of two-year, backward-looking export growth in the focal establishment's industry, $EXPSHOCK$, where the weight is given by a measure of the firm's export intensity (the log of the firm's total exports per dollar of payroll). In the second stage, we estimate the effect of organizational structure on redeployment while controlling for selection into the sample of closing units. The assumption behind this approach is that a downturn in an establishment's industry affects the probability of closing, but, conditional on closing, does not affect whether the firm decides to redeploy a worker. We believe that this assumption is valid because the firm's redeployment decision will consider current and expected future opportunities in its ongoing businesses, rather than past performance of the closing business.

To implement the Heckman approach, we estimate the following models in the sample of all workers employed in closing establishments during 2008–2014.

$$Closure_{it}^{jfk} = \mathbf{1}\left[\alpha\, EXPSHOCK^{j} + \gamma\, DEC^{f_0} + \theta_1' \boldsymbol{X}_t^f + \theta_2' \boldsymbol{Y}_t^j + \theta_3' \boldsymbol{Z}_{it} + \omega_{tk} + v_{it} > 0\right] \quad (1)$$

$$Redep_{it}^{jfk} = \beta\, DEC^{f_0} + \delta_1' \boldsymbol{X}_t^f + \delta_2' \boldsymbol{Y}_t^j + \delta_3' \boldsymbol{Z}_{it} + \psi_{tk} + \varepsilon_{it} \quad (2)$$

where Equation (1) is the first-stage model for selection into closing, and Equation (2) is the second-stage redeployment decision. The variable $Closure_{it}^{jfk}$ denotes that worker i was employed in unit j that closed in year t, and $Redeployed_{it}^{jfk}$ is an indicator variable denoting that worker i who was employed in unit j that closed in year t was redeployed within the firm (versus dismissed). DEC^{f_0} denotes firm f's degree of decentralization measured in 2008 and $EXPSHOCK^{j}$ is the export growth measure described above. Vectors $\boldsymbol{X}$, $\boldsymbol{Y}$, and $\boldsymbol{Z}$ contain time-varying firm, establishment, and worker level control variables, and both equations include an industry-year fixed effect (ω_{tk} and ψ_{tk}). We assume the error term v_{it} is normal (making the selection equation a probit model). The main coefficient of interest is β, which indicates whether decentralized firms are more or less likely to engage in redeployment in response to business closure.

5 PRELIMINARY RESULTS

5.1 Organizational Structure and Redeployment Following Establishment Closure

Table 3 presents the results of the analysis of redeployment following establishment closures. Column (1) shows results for the model in Equation (2) estimated via OLS with no correction for selection into closing. Column (2) presents estimates of the selection model in Equation (1) with *Closure* as the dependent variable, and Column (3) presents the second stage estimates of Equation (2) correcting for selection into closing. The observations in the OLS model represent approximately 30,000 employees at risk of displacement from 422 establishments that closed during the sample period while the number of observations in the first-stage of the Heckman model represents annual observations of all workers employed in sample firms during 2008–2014.

The OLS results indicate that decentralized firms were *less* likely to redeploy workers within the firm following establishment closure. The magnitude of the coefficient on *Hiring autonomy* in Column (1) indicates that firms with a one-unit higher decentralization score were 6.3 percentage points less likely to redeploy workers (p = 0.037), which represents a 43 percent reduction over the mean redeployment rate in closing establishments (14.6 percent). The coefficients on the control variables indicate that older, more educated, and managerial workers are more likely to be redeployed when establishments close. In this model, worker gender and the establishment- and firm-level control variables are not predictive of redeployment rates.

The results of the first stage of the Heckman selection model in Column (2) indicate that the *Export shock* is relevant in predicting establishment closure. The coefficient implies that establishments that experienced a greater positive shock (i.e., exporting firms in industries where exports are growing nationally) were significantly less likely to close (p = 0.000). Other first-stage coefficients indicate that firms are less likely to close large establishments; while, conditional on controls, firm size is positively correlated with establishment closure rates. MNCs are less likely to close establishments.

The estimates of the second stage of the Heckman model in Column (3), correcting for sample selection, show that the coefficient on the decentralization measure remains negative and significant and is generally *larger* than the OLS estimate. The models controlling for selection imply that firms with a one-unit higher decentralization score were 7.7 percentage points less likely to redeploy a worker (p = 0.000).

5.2 Where are Workers Redeployed To?

Next, we examine how centralization relates to the locations redeployed workers are moved to after establishments close. Tate & Yang (2015) report that redeployed workers in diversified firms move to industries with better opportunities and do so more frequently, and with lower wage losses, than workers transitioning between employers in the outside labor market. Here, we examine the potential role of centralization in enabling such transitions.

Table 4 shows estimates for a model of the probability that a redeployed worker remains in the same five-digit industry. The results suggest that, conditional on redeployment, workers in more decentralized firms are no more likely to remain in the same industry conditional on redeployment. This pattern suggests that while decentralization affects the selection of workers into redeployment (Table 3), it does not affect the ability of redeployed workers to move their skills across industries.

6 ROBUSTNESS TESTS AND ADDITIONAL ANALYSES

6.1 Alternative Measure of Decentralization

Our primary analysis uses hiring autonomy as our preferred measure of decentralization. Table A1 shows the results of the OLS and Heckman two-step analyses of redeployment following establishment closure using the overall decentralization score, constructed following the approach in Van Reenen et al., (2021). Since this measure is normalized across sample firms, the estimated coefficients represent the effects of a one standard deviation increase in the decentralization score.

The pattern of results in Table A1 is consistent with the main results in Table 3; more decentralized firms are less likely to redeploy workers when closing establishments. Here also, the Heckman estimates controlling for sample selection are significantly larger than the OLS estimates.

7 DISCUSSION AND CONCLUSION

An increasingly rich literature on resource redeployment has proliferated with little regard to how organizational structure facilitates or inhibits it. This paper attends to this very issue, building on claims by Helfat and Eisenhardt (2004) that structure should be an important determinant of redeployment. We find that indeed it is. Employees are more likely to be redeployed when they work in more centralized firms. This evidence seems to contrast with predictions by Helfat and Eisenhardt (2004) and invites future scrutiny.

REFERENCES

Belenzon, S., & Tsolmon, U. (2016). Market frictions and the competitive advantage of internal labor markets. *Strategic Management Journal*, *37*(7), 1280–1303.

Bloom, B. N., Sadun, R., & Reenen, J. Van. (2010). Does Product Market Competition Lead Firms to Decentralize? *American Economic Review: Papers & Proceedings*, *100*(2), 434–438.

Cestone, G., Fumagalli, C., Kramarz, F., & Pica, G. (2020). *Insurance between Firms: The Role of Internal Labor Markets* (CSEF Working papers 386).

Chen, M., Kaul, A., & Wu, B. (2019). Adaptation Across Multiple Landscapes: Relatedness, Complexity, and the Long Run Effects of Coordination in Diversified Firms. *Strategic Management Journal*, 40: 1791-1821.

Dickler, T. A., Folta, T. B. (2020). Identifying Internal Markets for Resource Redeployment. *Strategic Management Journal*, 41: 2341-2371.

Dickler, T. A., Folta, T. B., Giarratana, M. S., & Santaló, J. (2022). The value of flexibility in multi-business firms. *Strategic Management Journal*, *43*(12), 2602–2628. https://doi.org/10.1002/smj.3434

Faccio, M., & O'Brien, W. (2021). Business Groups and Employment. *Management Science*, *67*(6), 3468–3491.

Giarratana, M. S., & Santaló, J. (2020). Transaction Costs in Resource Redeployment for Multiniche Firms. *Organization Science*, *31*(5), 1159–1175.

Giroud, X., & Mueller, H. M. (2019). Firms' internal networks and local economic shocks. *American Economic Review*, *109*(10), 3617–3649. https://doi.org/10.1257/aer.20170346

Heckman, J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, *47*(1), 153–161.

Helfat, C. E., & Eisenhardt, K. M. (2004). Inter-temporal economies of scope, organizational modularity, and the dynamics of diversification. *Strategic Management Journal*, *25*(13), 1217–1232.

Huneeus, F., Larrain, B., Larrain, M., & Prem, M. (2021). The internal labor markets of business groups. *Journal of Corporate Finance*, *69*(September 2020), 102017. https://doi.org/10.1016/j.jcorpfin.2021.102017

Levinthal, D. A., & Wu, B. (2022). Corporate Strategy: An Opportunity Cost Perspective. *Available at SSRN*.

Lieberman, M., Lee, G., & Folta, T. (2017). Entry, Exit, and the Potential for Resource Redeployment. *Strategic Management Journal*, *38*(3), 526–544.

Rawley, E. (2010). Diversification, Coordination Costs, and Organizational Rigidity: Evidence from Microdata. *Strategic Management Journal*, 31: 873-891.

Sakhartov, A. V., & Folta, T. B. (2014). Resource Relatedness, Redeployability, and Firm Value. *Strategic Management Journal*, 35: 1781-1797.

Sakhartov, A. V, & Folta, T. B. (2015). Getting Beyond Relatedness as a Driver of Corporate Value. *Strategic Management Journal*, *36*(13), 1939–1959.

Sakhartov, A. V. & Helfat, C. E. (2022). Resource Redeployment in Multi-Business Firms: Centralized or Decentralized? University of Illinois working paper.

Tate, G., & Yang, L. (2015). The Bright Side of Corporate Diversification: Evidence from Internal Labor Markets. *Review of Financial Studies*, *28*(8), 2203–2249.

Van Reenen, J., Aghion, P., Bloom, N., Lucking, B., & Sadun, R. (2021). Turbulence, firm decentralization and growth in bad times. *American Economic Journal: Applied Economics*, *13*(1), 133–169.

Wolfolds, S. E., & Siegel, J. (2019). Misaccounting for endogeneity: The peril of relying on the Heckman two-step method without a valid instrument. *Strategic Management Journal*, *40*(3), 432–462. https://doi.org/10.1002/smj.2995

Wu, B. (2013). Opportunity costs, industry dynamics, and corporate diversification: Evidence from the cardiovascular medical device industry, 1976–2004. *Strategic Management Journal*, *34*(11), 1265–1287.

TABLES

Table 1: Summary statistics and correlations

			Correlations			
Firms	Mean	SD	(2)	(3)	(4)	(5)
(1) Hiring autonomy	3.1	1.2	-0.06	-0.08	-0.03	-0.07
(2) Employees	473	736		0.31	0.32	0.19
(3) Establishments	3.1	7.8			0.52	0.03
(4) Industries	1.4	0.8				0.05
(5) Multinational	0.2	0.4				
Establishments	Mean	SD	(2)	(3)		
(1) Closure	0.05	0.22	-0.09	-0.02		
(2) Employees	155	315		-0.01		
(3) Trade shock instrument	-0.03	0.24				
Workers	Mean	SD	(2)	(3)	(4)	(5)
(1) Wage (R$)	3,129	4,633	0.24	0.08	0.51	0.52
(2) Age	33	10		0.05	0.12	0.13
(3) Male	0.73	0.44			-0.06	0.01
(4) College degree	0.11	0.31				0.37

Table 2: Summary statistics of decentralization subcomponents

			Correlations			
	Mean	SD	(2)	(3)	(4)	(5)
(1) Hiring autonomy	3.10	1.25	0.06	0.11	0.16	0.58
(2) CAPEX autonomy ($)	18,942	95,207		0.11	0.00	0.52
(3) Sales and marketing activity	1.52	0.96			0.33	0.64
(4) New product activity	2.23	1.13				0.61
(5) Overall (normalized)	0.00	1.00				

Notes: Data from the 2008 wave of the World Management Survey.

Table 3: Organizational Structure and Redeployment Following Establishment Closures

	OLS	Two-stage Heckman	
Dependent variable:	Redeployment	Closure	Redeployment
	(1)	(2)	(3)
Hiring autonomy	-0.063 **	0.010 **	-0.077 ***
	(0.030)	(0.004)	(0.016)
Log worker wage	0.001	-0.003	-0.001
	(0.003)	(0.003)	(0.002)
Log worker age	0.043 ***	-0.020	0.045 ***
	(0.009)	(0.013)	(0.006)
Male	0.000	-0.065 ***	0.007
	(0.005)	(0.010)	(0.006)
College degree	0.034 ***	-0.055 ***	0.043 ***
	(0.011)	(0.012)	(0.007)
Manager	0.040 ***	-0.030	0.040 ***
	(0.013)	(0.023)	(0.012)
Log unit employees	-0.008	-0.602 ***	0.090 **
	(0.008)	(0.004)	(0.037)
Log firm employees	0.021	0.228 ***	-0.053 ***
	(0.035)	(0.006)	(0.015)
Firm establishments	-0.000	-0.006 ***	0.000
	(0.002)	(0.001)	(0.003)
Firm industries	-0.015	0.010 *	0.016
	(0.022)	(0.006)	(0.019)
Multinational firm	0.092	-0.049 ***	-0.030
	(0.057)	(0.014)	(0.040)
Export shock		-0.924 ***	
		(0.030)	
λ		-0.245 ***	
		(0.084)	
Observations (workers)	30,560	1,216,346	22,874

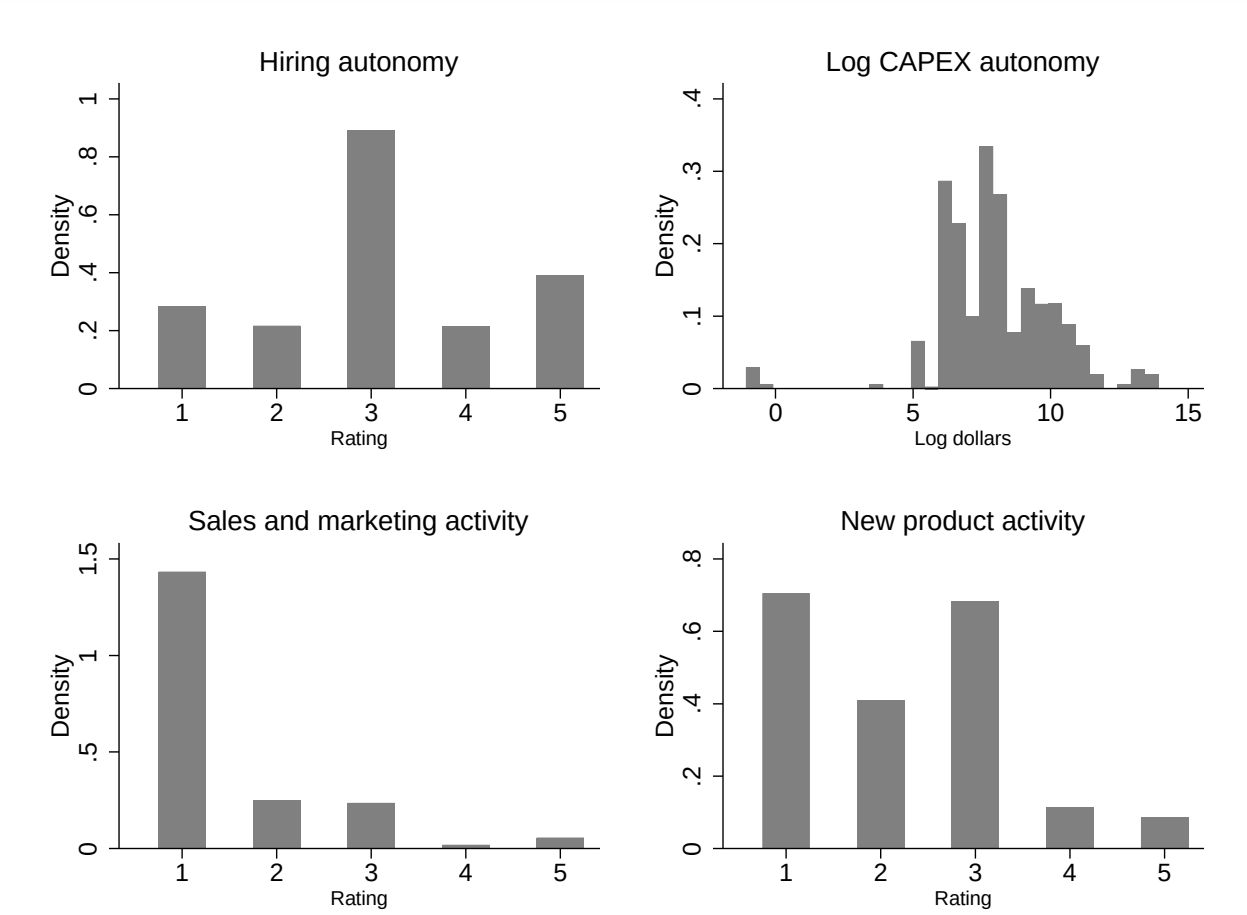
*** p<.01, ** p<.05, * p<.1

Notes: Observations are workers employed at multi-establishment firms during 2008–2014. *Redeployment* is an indicator for redeployment and *Closure* is an indicator for closing establishments. Column (1) present OLS estimates with standard errors clustered by establishment. Column (2) presents (probit) estimates from the first-stage selection model, and Column (3) presents the second stage, estimated using the two-step method (*heckman* command in Stata). All models include an industry-year fixed effect. Standard errors reported in parentheses.

Table 4: Same-industry redeployment following closure

	(1)	(2)	(3)	(4)
Hiring autonomy	-0.008	-0.636 ***	0.019	-0.098
	(0.101)	(0.160)	(0.070)	(0.309)
Log worker wage			-0.070	-0.017
			(0.054)	(0.012)
Log worker age			-0.060	0.028 *
			(0.062)	(0.014)
Male			-0.050	-0.023
			(0.051)	(0.023)
College degree			-0.098 **	-0.036 **
			(0.039)	(0.017)
Manager			0.083	0.036 *
			(0.057)	(0.021)
Log unit employees			0.052	0.140 **
			(0.049)	(0.065)
Log firm employees			0.009	-0.190 **
			(0.072)	(0.087)
Establishments				
3			0.313	-0.510
			(0.269)	(1.398)
4+			0.190	-0.283
			(0.293)	(0.888)
Industries				
3+			-0.155	0.346
			(0.155)	(0.343)
Multinational firm			0.281	0.665
			(0.180)	(0.469)
Intercept	0.637 **	2.415 ***	0.890	1.628
	(0.288)	(0.452)	(0.706)	(2.178)
Fixed Effect				
Year	•		•	
Industry-year		•		•
Establishments	175	148	168	142
Observations	2,293	2,266	2,199	2,173
R^2	0.053	0.820	0.217	0.842

FIGURES



Notes: Histograms for the four subcomponents of the *Overall decentralization* measure; higher values indicate greater autonomy. Ratings of 1 indicate headquarter decisions, while 5 indicates that plant managers decide.

Figure 1: Decentralization measures

APPENDIX

Table A1: Organizational Structure and Redeployment Following Establishment Closures (Alternative Decentralization Measure)

	OLS	Two-stage Heckman	
Dependent variable:	Redeployment	Closure	Redeployment
	(1)	(2)	(3)
Overall decentralization	-0.130 ***	-0.079 ***	-0.247 ***
	(0.041)	(0.007)	(0.020)
Log worker wage	0.003	-0.015 ***	0.000
	(0.003)	(0.003)	(0.002)
Log worker age	0.032 ***	-0.021	0.032 ***
	(0.007)	(0.015)	(0.006)
Male	-0.000	-0.056 ***	-0.006
	(0.005)	(0.011)	(0.005)
College degree	0.043 ***	-0.143 ***	0.042 ***
	(0.012)	(0.017)	(0.009)
Manager	0.032 **	-0.145 ***	0.013
	(0.014)	(0.034)	(0.015)
Log unit employees	0.006	-0.738 ***	-0.016
	(0.009)	(0.005)	(0.027)
Log firm employees	0.016	0.323 ***	-0.015
	(0.031)	(0.007)	(0.013)
Firm establishments	0.002	-0.020 ***	-0.009 ***
	(0.002)	(0.001)	(0.003)
Firm industries	0.012	0.145 ***	0.012
	(0.034)	(0.008)	(0.019)
Multinational firm	0.255 ***	0.182 ***	-0.079 **
	(0.072)	(0.019)	(0.036)
Export shock		-0.827 ***	
		(0.031)	
λ		0.032	
		(0.054)	
Observations (workers)	25,802	1,001,107	19,299

*** p<.01, ** p<.05, * p<.1

Notes: See notes to Table 3.