

The Influence of Organizational Context on the Managerial Turnover–Performance Relationship

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Abstract

This study performs a comprehensive examination of organizational context in the relationship between managerial turnover and organizational performance. Using theoretical frameworks of human and social capital, we focus on the moderating roles of entity size, employment system, industry brand, and location. To test our hypotheses, we worked with the company records of a multinational fashion retail group with more than 4,000 stores grouped into eight different brands and 100,000 employees in more than 31 countries. In order to estimate the causal contextual effects of the relationship between voluntary managerial turnover and organizational performance, we designed a quasi-experiment using propensity score matching (PSM) analysis. Our results show that the dysfunctional side of managerial turnover is significant for stores that are large, for stores managed under a primary employment system, for brands operating with higher levels of service orientation, and for countries with more restrictive employment protection legislation. We discuss the implications of these findings for practice and for future research.

Keywords: managerial turnover, unit performance, propensity score matching, contextual moderators.

Introduction

The relationship between turnover and organizational performance has been important for management scholars and practitioners for decades (Hausknecht, 2017; Heavey, Holwerda, & Hausknecht, 2013; Hom, Lee, Shaw, & Hausknecht, 2017). Meta-analyses have shown that turnover generally has a significant negative impact on various productivity-related outcomes and financial performance indicators (Hancock, Allen, Bosco, McDaniels, & Pierce, 2013; Hancock, Allen, & Soelberg, 2017; Park & Shaw, 2013). In theory, turnover entails a loss of human and social capital that disrupts operations and communications networks and destabilizes organizational systems (Price, 1977; Shaw, Duffy, Johnson, & Lockhart, 2005a; Staw, 1980). Additionally, literature also reports evidence with much less empirical support for an inverted-U shape, suggesting that turnover could impact performance positively or negatively according to the level of turnover experienced by units (Hancock, et al., 2013; Park & Shaw, 2013).

While the vast majority of studies have focused on employee turnover (Hancock et al., 2013; Hom et al., 2017) regardless of the position held by the person who departs, we advocate models tailored to the characteristics of a particular job position because the consequences that occur at the level of non-managerial employees may not be generalizable to managers (Eckardt, Skaggs, & Youndt, 2014; Hale, Ployhart, & Shepherd, 2016; Hausknecht & Holwerda, 2013; Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006; Shaw et al., 2005a). A managerial role entails the coordination of individuals and activities within an organization, the determination of staffing levels, and the reassignment of roles and redistribution of tasks within the unit (Staw, 1980). As such, the work of managers often involves a number of complex and unstructured tasks grounded upon significant tacit knowledge compared with non-managerial employees (Eckardt et al., 2014). Losing managers can be particularly damaging, then, because the company loses tacit knowledge as well as a person responsible for complex social

connections between firm functions and routines (Brymer & Sirmon, 2018). Hausknecht and Holwerda (2013) argue that turnover will be more disrupting to performance when leavers depart from relatively valuable groups that possess greater firm-specific human and social capital.

At the same time, previous research has consistently documented that organizational context plays a significant role in the impact of turnover on firm effectiveness (e.g., Hausknecht & Holwerda, 2013; Hausknecht, Trevor, & Howard, 2009; Nyberg & Ployhart, 2013). However, current meta-analyses show that the literature has yet to reach a state of maturity because these effects are not clearly understood, requiring expanded turnover studies to better capture the organizational context (Hancock et al., 2017; Hausknecht, 2017; Hom et al., 2017). To address this situation, Lee and colleagues suggest studying the moderating effect of a particular job level because the efficacy of moderators may vary across levels (Lee, Hom, Eberly, Li, & Mitchell, 2017). Along this line, Eckardt et al. (2014) found that the impact of organizational capital, as a moderator of the turnover–performance relationship, is greater for employee turnover than for manager turnover in service firms. Thus, as the moderating role of context may differ in non-managerial versus managerial turnovers, our approach to interpreting context-specific relationships of turnover and organizational performance is to perform a comprehensive examination of the organizational context of the managerial turnover–performance link. Specifically, we build upon the contextual factors identified by Park and Shaw (2013) in their meta-analysis (size, employment system, industry, and location).

Our research directly answers two questions: 1. Does voluntary managerial turnover consistently produce a negative significant net effect on organizational performance? 2. Are the impacts of voluntary managerial turnover related to the organizational context? In addressing these research questions, we build on individual level turnover theories and mainly discuss the consequences of managerial departure on a retail store environment. By working

with managers this research provides an opportunity to investigate the losses associated with this relatively valuable group, isolate the effects of those losses, and offer new insights about the factors that shape this turnover–organizational performance link. Also, we focus on voluntary turnover exclusively, not on involuntary turnover, since researchers often have suggested that the etiology and consequences of these two phenomena are different (e.g., Hausknecht & Trevor, 2011; Osterman, 1987; Shaw, 2011). Voluntary turnover is unexpected, and generally occurs among high-performing employees with high levels of employability. It is therefore more damaging than involuntary turnover like discharges and layoffs planned by the company in advance (Shaw, 2011). Involuntary turnover is a decision made by the company to correct for selection mismatches and eliminate poor performers (Batt and Colvin, 2011).

To test our hypotheses, we relied on a unique database collected from a multinational fashion retail group with more than 4,000 stores grouped into eight different brands and more than 100,000 employees in 31 countries. In our cross-unit study, we controlled for sources of extraneous variance affecting the relationship between turnover and performance, improving our capacity to isolate the examined effects (Glebbeck & Bax, 2004; Kacmar et al., 2006). By holding certain threats to internal validity constant (Shadish, Cook, & Campbell, 2001), cross-unit studies (versus cross-organization) “can be better for addressing causality issues” and ensure “consistent definition and measurement of turnover” (Park & Shaw, 2013, p. 272). Also, we concentrated on store managers, not considering managers from headquarters who are technically more qualified and perform different job responsibilities and tasks. Given the characteristics of our database, we believe that our results will apply to most multinationals requiring management over dispersed worldwide sites and facing different labor conditions, employment systems, and degrees of competition.

This study makes three main contributions. First, responding to calls to better explain turnover consequences of core employees such as managers (Hausknecht & Holwerda, 2013;

Nyberg & Ployhart, 2013), we blend human and social capital theories to build and test theoretical arguments regarding the impact of losing both firm-specific tacit knowledge and coordination between firm functions and routines. Past studies mainly have been conducted on total turnover rates regardless of the job level. In general, managers are comparatively less studied in turnover research, usually because of data availability or issues with small sample sizes.

Second, our study answers ongoing calls for contextualization of the turnover–performance relationship (Hausknecht, 2017; Hom et al., 2017). In a review of the contextualization models of turnover, Lee and colleagues (2017) recommended tailoring the turnover–performance relationship to an organizational position. Our research offers a comprehensive assessment of contextual moderators by studying a worldwide, multi-organization, and multi-unit dataset of managers who voluntarily leave their position. Since voluntary turnover is often surprising and unmanageable (Shaw, Delery, Jenkins, & Gupta, 1998), this study predicts when the most adverse consequences could emerge.

Third, in agreement with a recent study that encourages researchers to introduce new analytical tools in the turnover literature (Lee et al., 2017), we address the foregoing questions using propensity score matching. This methodology, introduced by Rosenbaum & Rubin (1983) and widely applied in other social science fields (e.g., labour economics, accounting, and finance) (Li, 2003; Soublière & Gehman, In Press), allowed us to design this study as a quasi-experiment. The use of quasi-experimental designs instead of correlational studies has been recommended to overcome the potential dominant analytical mindset in turnover research and to better infer causality (Allen, Hancock, Vardaman, & Mckee, 2013), since it rethinks usual causal relations in a counterfactual stance and corrects the bias of traditional regression models to address causal inference in observational studies (Nichols, 2007, Li 2013).

Conceptual Background And Hypotheses

Managerial Turnover

Human capital theory suggests that organizational performance is determined by the stock of knowledge or characteristics of employees that contribute to organizational productivity. According to this view, when employees leave, an organization loses valuable knowledge, skills, and abilities (Osterman, 1987; Strober, 1990) and incurs replacement costs (e.g., recruitment, selection, or training expenses) and loss of productivity (Dess & Shaw, 2001). One issue in this theory particularly relates to turnover: knowledge transfer. While explicit knowledge, consisting of knowledge that can be codified and articulated, is easy to communicate and transfer (Simonin, 1999), tacit knowledge is non-verbalized, intuitive, unarticulated, and difficult to express and communicate (Polanyi, 1967). Tacit knowledge is embedded within informal processes and routines, skillful actions, and values and beliefs (Nonaka & Von Krogh, 2009). It is difficult to transfer because it is subjective and context bound—the result of personal experience (Grant 1996).

In certain situations individual turnover may be positively related to performance (e.g., replacing poor performers, increasing innovation or flexibility), but in the managerial sphere this relationship typically is negative because of transfer issues related to firm-specific tacit knowledge. Some mentoring approaches mitigate the impact of turnover, but transferring tacit knowledge is clearly time consuming and may lead to inefficiencies at higher job levels (Eckart et al., 2014). Many studies have illustrated the value of firm-specific tacit knowledge. For example, Ton and Huckman (2008) found that dependence on tacit knowledge was related to inventory management in a retail bookstore and increased the adverse effect of turnover. Hale et al. (2016) studied the effects of turnover in a bank branch environment where a branch manager handled customer problems that couldn't be solved by other employees. The loss of

tacit knowledge disrupted the branch processes developed over time to deal with customer requirements, negatively influencing customer service.

Beyond the loss of explicit knowledge and the disruption of key routines and procedures, management turnover is likely to have a great impact because management experience and the resultant firm-specific tacit knowledge are valuable resources difficult to substitute. As Hale et al. (2016, p. 910) stated, a "manager can fill in for any employee who has left, but an employee can generally not fill in for a manager." Even if the manager is rapidly substituted with a higher-quality successor, it will take time for the new person to gain experience and learn firm-specific tacit knowledge (Kacmar et al., 2006; Shaw, 2011). Thus, this perspective suggests that managerial turnover, by reducing firm-specific tacit knowledge, relates negatively to organizational performance.

Social capital theory also provides a formal approach for explaining the turnover–performance relationship. It suggests that organizational performance is determined by any valuable asset that stems from social relationships (Coleman, 1990; Granovetter, 1992). It can come from internal networks, connecting various firm functions and routines, or from external networks, connecting external stakeholders (Fisher & Pollock, 2004). Nahapiet and Ghoshal (1998) highlight that social capital increases performance because of its association with a shared vision, trusting relations, and social ties. As such, it facilitates access to resources, communication flow, and information exchange, but it also can have negative ripple effects when the relationships disappear. Turnover diminishes social capital because it disrupts established patterns of interaction and prevents access to resources residing in social relationships. As result, companies have to deal with the cost of newcomer socialization (Park & Shaw, 2013).

There is evidence that the loss of individuals who are critical network members may be more damaging for the organization (Dess & Shaw, 2001; Hausknecht & Holwerda, 2013;

Shaw et al., 2005a). Staw (1980) states that "the chief moderator of whether turnover causes an operational disruption is the centrality of the particular role to the organization's functioning. In general, the higher the level of the position to be filled the greater is the potential for disruption" (p. 256). Because managers are core employees responsible for the identification and coordination of expertise to accomplish shared goals, the disruptive effect of a manager's departure may be much larger than seen in lower-level employee turnover. Knowledge coordination and integration is an important concern with managerial turnover in this theory. The exit of a manager and the introduction of a new one can erode social capital because the organization's implicit coordination logic is not easily observed and the new manager might have difficulties understanding how the organization's members communicate and develop their activities (Argote, Aven & Kush, 2018). Managerial turnover has the potential to alter the organization's work flow which may produce disorder in prior states, diminishing the ability to integrate human capital inside and outside the organization (Messersmith, Lee, Guthrie, & Ji, 2014).

Taken together, human and social capital theories complement each other in focusing on factors necessary for organizational functioning (Dess & Shaw, 2001). Therefore, social capital losses from turnover should be added to human capital losses as a predictor of performance (Shaw, Duffy, et al., 2005). Both theories are useful to explain why managerial turnover levels shape performance. From a human capital perspective, managerial turnover results in the loss of firm-specific tacit knowledge upon which other employees depend, and additionally may impede the redevelopment of this tacit knowledge since it is based on experience. From a social capital perspective, managerial turnover might alter the social structure required to share knowledge, vision, and norms of friendship and reciprocity. Thus,

Hypothesis 1: There is a negative relationship between managerial turnover and performance.

Contextual Drivers of the Managerial Turnover–Organizational Performance Relationship

Our second research question addresses potential relations between the impact of managerial turnover on organizational performance and the operating context, as it has been argued that the turnover effect is highly contextual (Batt & Colvin, 2011; Hancock et al., 2013; Hancock et al., 2017; Heavy et al., 2013; Park & Shaw, 2013). We discuss the contextual factors outlined by Park and Shaw (2013) in their meta-analysis as potentially important to this relationship: entity size, employment system, industry, and location.

Entity size. Researchers have theorized that the effect of turnover depends on the amount of coordination demanded by the organization. The more coordination required, the greater the consequences of turnover (Nyberg & Ployhart, 2013). In general, organizations with more interdependences in their workflow require more social capital to facilitate interaction and coordination between employees to perform effectively. In these structures, the managerial role has greater exposure and responsibility for the tasks that are being performed and encounters more instances of problems that need to be overcome (Humphrey et al., 2009; Summers et al., 2012), emphasizing the importance of human capital. On the other hand, when tasks are quite independent and the need for coordination is minimal, the disruptive effects of managerial turnover are always less problematic. Thus, interdependences and the need for coordination moderate the effect of managerial turnover on performance.

Managerial turnover may create greater challenges for bigger entities. In the retail setting, for example, larger stores usually carry the most varied range of products and are placed in locations facing intense competition. They experience a much higher product turnover since they receive the largest and most diverse flow of customers every day, thus increasing the probability of customer service incidents that must be dealt with. In general, greater size is associated with a more complex environment, requiring higher levels of interdependences and

highly synchronized interaction and communication (Nyberg & Ployhart, 2013). As a result, bigger entities are likely to experience coordination difficulties that may generate task conflict when a manager leaves, by creating new responsibilities for the remaining members of the organization (Kuypers, Guenter, & van Emmerik, 2018). In addition, large entities facing managerial turnover will find communication, social interaction, and participation among members reduced, cohesiveness and commitment inhibited, and satisfaction decreased (Colquitt, Noe, & Jackson, 2002; Green, Anderson, & Shivers, 1996; Kozlowski & Bell, 2003; LePine, Piccolo, Jackson, Mathieu, and Saul, 2008).

Unlike bigger units, smaller entities exhibit stronger connections between members, better opportunities for communication and socialization, and higher levels of commitment. This cohesiveness actually demands less coordination, which means that efficiency may not be affected by managerial turnover as much as it would be in a bigger unit. In addition, managing the inefficiencies associated with larger entities demands a substantial amount of tacit knowledge (e.g. service values and norms) that is often acquired through experience and not easily transferred to replacement hires. This greater dependence on management abilities may exacerbate the negative turnover effect.

This argument is consistent with the work of Hausknecht et al. (2009), who found that voluntary turnover was more damaging to customer service in larger work units—in contradiction to the idea that larger entities can buffer turnover disruptions because they possess more resources to deal with unanticipated departures (Green et al., 1996; Kozlowski & Bell, 2003; Park & Shaw, 2013). We explain this contradiction through context. In a cross-unit study, when we are able to control for sources of extraneous variance such as company policies, work design, and human resources management practices, the moderating effect of size only depends on the variability of internal processes in the entities (Glebbeck & Bax, 2004). In that case, larger stores covering a wider range of products may be inhibited in managing the

customer service demands and social structure changes brought on by turnover. Thus, we expect larger units to be less prepared to efficiently handle voluntary managerial turnover. Thus,

Hypothesis 2: The negative effect of managerial turnover on performance is stronger for larger entities than for smaller entities.

Employment system. The research literature suggests that the turnover–performance relationship is contingent on the nature of an organization’s work system (Siebert & Zubanov, 2009). Organizations use two main types of human resources systems: (a) primary (commitment maximizer) or (2) secondary (control or cost reducer) (Arthur, 1994; Shaw, Gupta, & Delery 2005). The primary system stresses the autonomy of employees—who play a pivotal or critical role in the organization—and is thought to build a stable organization–employee relationship. The secondary system emphasizes labor cost reduction and organizational control over work behaviors and is a signal of an organization's preference for short-term employment relationships. Both systems often coexist in organizations according to the relative value that they provide to the business (Lepak & Snell, 1999). But even within a homogeneous segment of employees or positions, organizations may combine commitment- and control-based employment relationships, in a search for optimal levels of cost efficiency (Guthrie, 2001) or volume flexibility (Kesavan, Staats, & Gilland, 2014). In retail settings, store managers are handled under a primary system, as they are trusted to operate autonomously in alignment with organizational goals (Siebert and Zubanov, 2009; Arthur, 1994). However, among the remaining store employees we find a combination of full-time and part-time workers. Full-time employees are the core of every store, with higher levels of autonomy, responsibility, training, and promotion opportunities. In contrast, part-timers are assigned to simpler tasks, receive less specialized training, and are allowed to increase their workday hours only in special, top-performing cases. Following Siebert and Zubanov (2009), it seems

reasonable to assume that full-time employees work under a primary system and part-time employees work under a secondary system.

Within this framework, two are the main components of the dysfunctional side of the managerial turnover, which occurs when a high-performing manager leaves the organization (Abelson and Baysinger, 1984). First, such departures lead to loss of human capital (e.g., managerial experience) necessary for important decisions (Park & Shaw, 2013). Under a primary system, it takes time for new managers to become familiar with each individual's work habits and abilities, and to learn how to motivate employees. As new managers learn their roles, it is likely that mistakes will be made, limiting the ability of a work unit to function in a synchronized manner. In a secondary employment system, the loss of firm-specific tacit knowledge is softened because operations are more routinized and less time is spent on careful employee selection or career development.

Second, the literature characterizes the relationship between employees and managers as an exchange in which employees reciprocate with feelings of commitment toward their managers (Liden, Wayne, & Sparrowe, 2000; Shore & Wayne, 1993). This commitment, built through repeated transactions, makes employees more willing to engage in open communication with managers and show greater behavioral transparency. By developing relationships with their employees, managers gain access to informational resources that can be mobilized to action (such as performance). Thus, considering that the manager-employee relationship creates social capital and that it provides incentives to engage in value-added initiatives, the dissolution of the relationship incurs loss. Interestingly, compared to part-timers, full-time employees tend to pay more attention to the quality of relationships with their co-workers and managers. Under a secondary system, employees are less involved in the social relationship and tend to emphasize the transactional (e.g. economic) aspect of the relationship (Schmidt et al., 2018). Accordingly, full-time employees are more sensitive to managerial

turnover than part-timers. When a manager quits, employees may experience a reduced sense of commitment and may no longer feel compelled to remain with the organization (Kacmar et al., 2006) or collaborate with the new manager. For example, in a sample of food restaurants Kacmar and colleagues (2006) found that managerial turnover is positively and immediately related to crew turnover. In addition, employees managed under a primary work system are more valuable in terms of human and social capital than those under control-based schemes, who are considered more like replaceable commodities (Shaw, Gupta, & Delery, 2005).

To sum up, managerial turnover disrupts the organization both directly, through the depletion of the manager's firm-specific tacit knowledge, and indirectly, by diminishing the organizational commitment of employees to use their skills and discretionary efforts, thereby shaping employees' quit decisions. Together, such consequences damage collaboration, work flow, and the trust between manager and employee. Thus, we expect that voluntary managerial turnover will be more harmful when employees are under a primary system than when they are under a secondary one.

Hypothesis 3: The negative effect of managerial turnover on performance is stronger for a primary employment system than for secondary employment systems.

Industry service orientation. In motivating this hypothesis, we observe that value of the human and social capital to a firm's performance depends on industry characteristics such as labor intensity (Guthrie and Datta, 2008; Eckart et al., 2014; Messersmith et al., 2014). That view is consistent with Park and Shaw (2013) who argue that the influence of turnover on performance depends on the role that employees play in the execution of tasks, suggesting that the relationship between turnover and performance will be stronger in labor-intensive industries like service settings. This argument is also valid to the brand level, representing different services orientation. Then, it is reasonable to argue that brand characteristics

regarding service orientation should moderate the effect of managerial turnover on performance.

In service-oriented brands (e.g., with higher customer targets demanding more involvement with customers about their purchasing decisions), the intangibility, co-terminality, and human resources intensity used to be superior (Miles, 2005). Intangibility is an indicator of the importance that customers give an experience or a purchasing process instead of a product (Bowen & Ford, 2002). Co-terminality implies greater interaction between customer and employee and highlights the importance of developing and maintaining high-quality relationships with customers versus focusing on conventional product characteristics (Edvardsson, Gustafsson, Kristensson, & Witell, 2010). Lastly, service orientation usually requires “knowledge and skills embodied in individuals (or teams)” (Gallouj & Weinstein, 1997, p. 543) because of the ambiguous and customer-specific nature of service.

All of the above characteristics emphasize the importance that human and social capital play in more service-oriented brands. Regarding the importance of human capital, Argote (2012) argues that the more critical the role of employees, the higher the degree to which turnover depletes knowledge. In support of this line of reasoning, an empirical study in a retail industry by Ton and Huckman (2008) found that the negative effect of turnover on performance was more pronounced for stores with lower levels of process conformance (the degree to which stores reduce variation in operations in accordance with a set of accepted practices, prescribed rules and regulations, or specified standards). When process conformance is stressed (low service-orientation), the retaining of human capital will be greater after employee departures, facilitating the transfer of knowledge to newer employees. In a similar vein, we expect that managerial turnover will be more damaging when the work environment is less clearly defined (high service-orientation) because store managers must make decisions associated with complex customer requirements that cannot be addressed by other employees. Indeed, the

uncertainty introduced by customer involvement in higher service-oriented brands empowers managers, increasing the degree of discretion available in making decisions (Messersmith et al., 2014).

In addition to human capital losses, we also expect that managerial turnover depletes more social capital in higher service-oriented brands. Social capital literature suggests that managerial quits affect customer satisfaction in three different ways (Merlo, Bell, Mengüç, & Whitwell, 2006). First, employees (and customers) no longer have access to the person who monitors a social structure with dense interactions, multiple connections, and valuable information. This means a loss of social ties that possess the potential for facilitating role modeling and developing collective behaviors when employees interact with customers. Second, because managers transmit a sense of shared purpose to employees, a managerial quit may dissolve a common understanding and approach to customer-related problems. Third, trust facilitates high levels of transparency and collaboration, and employees may feel their trust is betrayed when a manager departs—which can have an impact on customer service. For example, Davis, Schoorman, Mayer, and Tan (2000) found that restaurants exhibiting high levels of trust between general managers and employees allowed employees to expand the scale and scope of their exchange, translating to more effective ways to serve customers and thus more sales. When managers of high service-oriented brands leave, the absence of trust in knowledge transfer and coordination issues has a negative impact. We posit:

Hypothesis 4. The negative effect of managerial turnover on performance is stronger for more service-oriented brands.

Location: Labor market. As suggested by Park and Shaw (2013), location plays an important role as moderator of the relationship between turnover and performance. Prior research has shown distinct contextual characteristics across countries in terms of human resources management practices (Ahmad & Schroeder, 2003) and labor market characteristics

(Pfeffer, 1998). Because our cross-unit study allows us to control for the human resources strategy of our company, we explore location as a moderator, both in terms of the labor market regulations that determine employment opportunities and as a factor that may increase the predictability of turnover decisions (Park & Shaw, 2013).

In constructing our hypothesis on regulatory factors, employment protection legislation (EPL) provides an apt setting. Prior research in economics provides strong support for linking EPL with adjustment costs for labor (Holmlund, 2014). Designed to protect employees from job losses or the cost of job losses, EPL regulates procedures and costs involved in dismissing individuals or groups of workers as well as procedures involved in hiring workers on fixed-term or temporary work agency contracts (OCDE, 2017). Indeed, EPL not only imposes firing costs on firms but also affects hiring, as firms may extend the hiring process when the termination of employees is difficult, thus triggering higher costs of recruiting and selection. The hiring costs could become so high that the organization may even have incentives to relocate and train already-employed workers to replace departures. Greater restrictions in the labor market also can have implications for wage determination. From a cost-base perspective, Hancock et al. (2013) note that as replacement costs are a function of annual salary compensation, firms operating in a country with more stringent EPL would exhibit higher turnover costs. The influence of EPL on the turnover–performance relationship also is likely to be exacerbated by managerial turnover, as it involves a strategic position in the organization and is thereby the most attractive to alternative employers.

In addition, under strict employment regulation laws, firms may have stronger incentives to invest in firm-specific skills, thereby avoiding costly layoffs (Holmlund, 2014). As result, countries with strict EPL will be more capable to contain turnover because departures occur for legitimate reasons or are more predictable (Park & Shaw, 2013). However, more restrictive labor market legislation also tends to centralize and institutionalize the wage setting, which

may frustrate higher performers who observe that pay is not contingent on performance. Previous research found that when pay is contingent on performance, the performance–job satisfaction link is stronger (Podsakoff, Williams, & Todor, 1986). Because higher performers put more emphasis on job retention than pay for performance and also have more access to external opportunities (Nyberg, 2010), under more stringent labor markets this group is more likely to turn over. In contrast, more flexible labor markets may lead better performers to greater job satisfaction, reducing voluntary quits. More stringent labor markets may affect productivity by increasing voluntary turnover of better performers and making it more difficult to fire lower-level employees.

Considering the higher turnover cost (e.g. hiring cost, replacement cost, and investment in human capital) of better employees, we argue that countries with strict EPL will exacerbate the dysfunctional effects of managerial turnover (in contrast to those with looser regulations) via job alternatives and job satisfaction. In contrast, in more flexible labor markets, human and social capital promote positive evaluation and access to social support, contributing to increased organizational commitment and job satisfaction. Thus,

Hypothesis 5. The negative effect of managerial turnover on performance is stronger for countries with more restrictive labor regulations.

Methods

Empirical Analysis

Empirically our goal is to estimate the causal impact of voluntary managerial turnover on store performance. The central question here is how to construct a reliable comparison group. We address this issue by using propensity score matching (PSM) (Imbens & Wooldridge, 2009; Rosenbaum & Rubin, 1983). This non-parametric method uses the outcome for a group of

observations (stores, firms, individuals...) which received a “treatment” and compares them to another group that is very similar (“twins”) but did not receive the treatment.

Using treatment effect jargon, we are interested in estimating the average effect of a binary treatment (voluntary managerial turnover) on an outcome (store performance). Let $Y_i(1)$ denote the potential outcome if store i experiences managerial turnover and $Y_i(0)$ the potential outcome if the store i does not experience managerial turnover. If both $Y_i(1)$ and $Y_i(0)$ were observable, the effect of the treatment on store i would be directly observable as $Y_i(1) - Y_i(0)$. However, only one of the two potential outcomes is observed while the other is unobserved or missing, depending on whether the store has exhibited managerial turnover ($D=1$) or not ($D=0$). The matching estimators impute the missing potential outcome by using average outcomes for the store with “similar” values for the observed characteristics (counterfactual).

In particular, we estimate the *average treatment effect on the treated* ($ATT = E(Y_1 - Y_0/D=1) = E(Y_1/D=1) - E(Y_0/D=1)$), i.e., the average loss in terms of store performance of those which experienced managerial turnover compared to what would have happened had they not experienced it. In this case $E(Y_0/D=1)$ is not observed and therefore we estimate a counterfactual situation by using average outcomes for stores with “similar” values for the observed characteristics (X) that did not experience managerial turnover (control group, i.e., $E(Y_0/D=1) \approx E(Y_0/D=0)$).

In an ideal case, the matching would yield pairs of statistical twins that are exactly equal in each observed characteristic except for the existence of managerial turnover. However, in finite samples and with continuous variables, exact matches are usually not possible (the so-called "curse of dimensionality") (Rosenbaum & Rubin, 1983). Fortunately, propensity scores solve this dimensionality problem by compressing the relevant factors into a single score. Rosenbaum and Rubin (1983) show that it is sufficient to match individuals with identical values of the propensity score to remove any bias associated with different observable

characteristics. The propensity score is defined as the probability of treatment assignment (in our case, being a store with voluntary managerial turnover) conditional on observed characteristics ($\Pr(D/X)$). To generate propensity scores for our sample, we estimated a logit model in which the dependent variable is a dummy indicating whether the store has a voluntary managerial turnover or not (treatment), and the explanatory variables are store-specific characteristics and environmental factors described below (observed covariates).

Based on this estimated propensity score, we matched each store with managerial turnover to the store without managerial turnover with the most similar propensity score (one-to-one nearest neighbor). To check the sensibility of the results we also applied the five-to-one nearest-neighbors matching method, which matches each store with managerial turnover to the closest five stores without managerial turnover. Although the first match is always best and will lead to the least biased estimates, a broader many-to-one match will increase sample size and efficiency (Austin, 2011). However, as we will see later, the results are qualitatively not sensitive to the specific matching procedure used. Once the matched sample is formed, the average treatment effect on the treated is estimated as the mean difference in the store performance of the two groups.

Some critical issues should be considered in any propensity analysis. First, we have to ensure that there is overlap in the range of propensity scores across stores with and without voluntary managerial turnover (called "common support") (Austin, 2011; Caliendo & Kopeining, 2008; Rosenbaum & Rubin, 1985), since no inferences about treatment effects can be made for a treated individual for whom there is not a comparison individual with a similar propensity score. Therefore we did not include stores with a propensity score higher than the maximum or smaller than the minimum in the potential control group. In our case there were just a few stores (29) out of the common support.

Second, the propensity score model must be adequately specified. An adequate propensity model aims to create a matched sample in which the distribution of the observed characteristics is similar between stores with and without managerial turnover (termed balance) (Austin, 2011; Caliendo & Kopeining, 2008; Rosenbaum & Rubin, 1985). For instance, a propensity should have a similar distribution in the treated and comparison groups. In order to search for that specification we followed the strategy proposed by Dehejia and Wahba (1999, 2002). First we split the sample by blocks of the propensity score so that within each block the mean propensity score was equivalent in the groups of stores with and without managerial turnover. Second, we tested for equal means of the observed covariates in the two groups within all blocks.

We also applied other methods to check the quality of the matching. Following Austin (2011), Caliendo and Kopeining (2008), and Rosenbaum and Rubin (1985), we tested for non-significant differences in the mean values of the observed characteristic between the two groups of stores in the matched sample. We also analyzed the reduction in the absolute standardized difference in the mean and median after the matching and the variances ratio (see Austin (2011) for equations). Lastly, we also considered the reduction in the pseudo R² in the estimation of the propensity score and the lack of joint significance of the explanatory variables when the matched sample was used instead of the original sample.

Finally, the validity of PSM depends on the conditional independence assumption (also known as "selection-on-observables") (Rosenbaum & Rubin, 1985), which states that the assignment to treatment is independent of the outcomes, conditional on the covariates. This approach only uncovers the true causal effect of managerial turnover if all systematic differences in characteristics that influence store performance between stores with and without managerial turnover can be captured by the included control variables. Thus, we must rely on the observed covariates included in the analysis to cover all relevant factors that influence the treatment and the outcomes (Aerts & Schmidt, 2008).

Sample

Our sample frame consisted of 6536 stores of a multinational fashion retailer, a group of eight different brands located in more than 90 countries. Data came from company records filed in a centralized system operated from the headquarters, covering the period February 2016–January 2017. Our research setting included only store employees, leaving out the headquarters and regional offices because their characteristics and work dynamics are different from daily life in the stores. In parallel with data collection we performed a number of interviews with headquarters' managers and HR officers of several brands in order to clarify the context for our dataset, in particular the functions and responsibilities of managers and the operational differences of stores according to their size and number of employees.

The stores greatly vary in size, ranging from two to 278 workers. About 30 percent of the stores have 30 or more employees. These larger stores may have up to three layers of deputy managers, who are in charge of specific departments and sections. Regardless of its dimensions, every store has one or two managers who supervise the three main axes of unit operations: product (merchandising and shelf-stocking), processes (customer flows, cash lines, fitting rooms, etc.), and employees. The stores are very similar when it comes to this operating model, which constitutes the business strategy of the group. Their common mode of operation allows us to control for a whole set of variables (mainly store processes and products and the corresponding firm-specific human capital), which are kept constant for our sample.

Managers enjoy a high level of autonomy in the stores as far as employees are concerned. Headquarters sets out an objective of working hours for every store according to their characteristics (location, size, sales estimation, etc.). In compliance with this objective, managers are responsible for the elaboration and assignment of timetables among employees and are free to re-allocate working times in a highly dynamic way. They also have a last say both in hiring and firing decisions. Further, they can strengthen the commitment of store

assistants and other employees by assigning them more complex tasks or supervisory appointments, granting them access to training, and increasing their working hours according to the required schedules. Managers make these decisions in the context of the flexibility demanded by sales estimations and the seasonality that is connatural to the business. Given that managers are commonly promoted from within the stores, the estimation of company officers is that they are operationally proficient in three to four weeks.

We omitted from the analysis any stores that began or ceased operating during the observation period. Also, we excluded stores or countries for which any of our core contextual variables were not available. From the initial dataset, and in order to isolate the effect of managerial voluntary turnover, we began constructing our treatment group (N=1631) by identifying which stores had experienced voluntary turnover of managers with a minimum tenure of 30 days in the store during the year 2016. The untreated group (N=2371) consisted of stores with no managerial turnover (either voluntary or non-voluntary) over the same period. Therefore, we excluded from analysis the stores with (i) non-voluntary managerial turnover and (ii) voluntary managerial turnover with job tenure less than 30 days. After these screens, we were left with a sample of 4002 stores with 108,411 employees in 31 countries.

Measures

Treatment. The treatment is a dummy variable coded as 1 if the store has a voluntary managerial turnover and 0 if it has not. The construction of the variable is described above.

Outcomes. We worked with two different outcome measures reflecting store productivity: *change in sales per hour worked* and *change in sales per square meter*, the two of them between 2015 and 2016. The performance of a store is subject to multiple contingencies that are beyond the control of the store manager, from weather conditions to store locations with higher volumes of foot traffic. Therefore, and following previous studies in the field (e.g., Baron,

Hannan, & Burton, 2001; Glebbeek & Bax, 2004) we address *change in performance and productivity* over the absolute level of both variables during the year, in order to adopt a dynamic interpretation of the consequences of the turnover phenomenon (Batt, 2002; Shaw, Gupta & Delery, 2005b). In the spirit of comprehensiveness we decided to keep both variables and discuss their potential distinct results. The sales per hour measure is more proximal to the turnover phenomenon than sales per square meter, but in general both measures have shown negative correlations with turnover (Hausknecht & Trevor, 2011).

Observed covariates. The method applied required us to specify a model for the propensity score, i.e., for the probability of the store to experience managerial voluntary turnover. To ensure the selection-on-observables assumption, we used a wide range of observed variables to control for the potential impact of store specific characteristics and environmental factors on the voluntary managerial turnover–store performance relationship (Smith, 2000). We split these variable into two groups: observed contextual factors and other observed covariates.

Within the observed contextual factors, we took into account the potential effect of *store size*, measured as the total number of employees during the year. Second, we controlled for the *employment system* applied. Following Siebert and Zubanov (2009), we designated each employment system as primary or secondary by comparing the percentage of sales assistants with full-time contracts (primary) versus part-time contracts (secondary). Third, because our study works with different units from within the same organization and consequently from the same industry, the concept of industry should be nuanced. Our retailer comprises eight brands representing several fashion concepts, with different personalities and style visions. Therefore, we controlled for potential differences between brands in terms of service orientation by carrying out interviews with corporate HR officers and chain HR leaders. Stores in four brands are managed using a self-service approach, where customers make decisions

based on price and product convenience and do not expect service quality as part of their shopping experience. These brands target young customers and compete on low prices, differing in their fashion style and product type. The other four brands aim at more mature customers with purchasing power, and operate on a margin, service-based pricing strategy. On this basis we produced a two-group classification of brands according to their level of service orientation. Finally, we considered *labor market regulation* by means of the Employment Protection Legislation (EPL) index (OECD, 2017). EPL measures the degree of stringency of the employment regulations in OECD and G201 countries. It is an aggregate of 21 items concentrated in three areas: (i) protection of regular workers against individual dismissal; (ii) regulation of temporary forms of employment; and (iii) requirements for collective dismissals. Higher EPL scores are indicative of stricter regulations.

Within the other observed factors, because the maturity of internal processes and the proficiency of managers and employees are significant factors in shaping managerial rotation and store performance, we controlled for the *store age*, measured as the number of years that the store has been open. Second, we considered the impact of total employees quits on store performance by means of the *total staff turnover rate*, calculated as the ratio of total number of members in the store who left during the observed year over store staff (Hausknecht & Trevor, 2011). Third, we controlled for the dynamics of the store performance by including *the total of hours worked in 2015* and *the sales per hour worked in 2015*. In order to consider environmental factors we also added the *regional unemployment rate*. This variable is commonly controlled for in the turnover literature as it signals potential higher or lower opportunities in the labor market that may affect voluntary departures (Hancock et al., 2017). Finally, we took into account potential *cultural effects* to control for national differences affecting employees' behavior in stores by means of the GLOBE composite index (House, Hanges, Javidan, Dorfman, & Gupta, 2004).

As we have described above, our total sample belongs to the same retail group. Therefore, factors such as organization, corporate culture, and processes are controlled for, as they are shared across all stores in the group.

Tables A1 and A2, included in Appendix A, show the descriptive statistics and the correlation matrix of all variables.

Results

The first step of the matching procedure is the estimation of a logit model for the probability of voluntary managerial turnover (Table 1)¹. The results of the estimated coefficients are accessory and only used to calculate the propensity score, which is necessary to minimize the distance between two stores, as described above.

(Insert Table 1 about here)

To ensure that we compare similar stores, in Table 2 we report some diagnostic statistics to validate the specification of the propensity score model and the quality of the matching (Leuven & Sianesi, 2003). Specifically, we have included (a) a t-test for equality of means in the two samples before and after the matching; (b) the standardized percentage bias before and after matching, together with the achieved percentage reduction in $\text{abs}(\text{bias})$ (formulae from Rosenbaum & Rubin, 1985); and (c) the Rubin variance ratio for each covariate (Rubin, 2001). Ratio values in $[0.5, 0.8)$ or $(1.25, 2]$ indicate variables "of concern" and ratio values <0.5 or >2 "bad" or clearly unbalanced variables.

(Insert Table 2 about here)

The results show that before matching (that is, in the unmatched sample) the mean of all covariates differs significantly between stores with and without managerial turnover.

¹ The software used to obtain the results is Stata 15, specifically, *pscore* and *psmatch2* packages. Full documentation and *help files* are available in Becker & Ichino (2002) and Leuven & Sianesi (2003), respectively.

Specifically, the stores with managerial turnover (treatment group) have been opened more recently and are larger in size. They show higher levels of total staff turnover, are more likely to be managed under a commitment employment system, and have a lower proportion of part-time workers as sales assistants. In terms of contextual dimensions, these stores operate at lower levels of unemployment with less restrictive employment legislation. Also, for seven independent variables the values of the variance ratio exceed the thresholds established for a good balance. Specifically, in terms of variances, only two variables (low service intensity brand and total staff turnover) showed no significant differences. After the matching procedure the mean differences vanish and the variance ratios are close to 1. In addition, the percentage of bias reduction is higher than 90% in almost all covariates. Thus, all indicators show a high quality in the matching, which guarantees the reliability of the results.

Table 3 reports the average treatment effect of voluntary managerial turnover on the two indicators of store performance (ATT). The table includes the results for the one-to-one nearest neighbor (NN(1)) and five-to-one nearest neighbor (NN(5)) matching procedures. The results are robust for both, with minor differences between them, supporting H1. Given that one-to-one nearest neighbor, NN(1), only uses the best match, i.e., the closest, we focus our comments on NN(1) results².

(Insert Table 3 about here)

The estimates indicate that voluntary managerial turnover impacts negatively the change in sales per hour worked. More precisely, if we focus on NN(1) estimates, the increase in sales per hour worked is, on average, 1.9 percentage points lower for stores having managerial turnover compared to stores without it. In other words, average treatment effects are negative and statistically different from 0 [ATT=-0.019, p<0.01]. Similar results were obtained when

² As noted in the methodological section, when choosing among different matching procedures there is a trade-off between bias reduction and estimates efficiency .

considering the impact on the change in sales per square meter. The average gain of managerial turnover was negative and highly significant, with an average loss of 9.9 percentual points for a store suffering a voluntary managerial departure [ATT=-0.099, $p < 0.01$]. Similar numeric estimates were obtained when the NN(5) matching procedure was used, showing the robustness of the results.

Table 3 also includes some diagnostic checks to validate the results obtained. For both matching procedures, the Pseudo R^2 from the logit estimation of the conditional treatment probability (propensity score) on all the variables is close to 0 after matching. Also, we do not reject the null hypothesis of the likelihood-ratio test of the joint insignificance of all the regressors after matching. In addition, the mean and median biases, as summary indicators of the distribution of the abs(bias), clearly show lower values after the matching. Finally, we report Rubin's B statistic (the absolute standardized difference of the means of the linear index of the propensity score in the treated and non-treated (matched) group), and Rubin's R (the ratio of treated to non-treated (matched) variances of the propensity score index). The recommended values for samples to be considered sufficiently balanced are B less than 25 and R between 0.5 and 2 (Rubin, 2001). In our analysis these thresholds are clearly met in the matched sample.

Table 4 reports the results when contextual factors are taken into account. This analysis shows the estimated average treatment effects of managerial turnover on store performance when the sample is split according to the contextual factor analyzed³. The matching diagnostic statistics included in Table 4 show that the quality of the matching is satisfied in all the cases.

(Insert Table 4 about here)

³ To address the impact of a contextual factor we split the stores into groups to create subsamples with a different behavior in terms of that contextual factor. Once the subsamples were created, we repeated the matching procedure to assure we were comparing similar stores with and without managerial turnover. We could not consider all possible values of the contextual factor because then the matching would not be feasible.

With regards to store size, we learned from company officers that the cut-off value to differentiate between large and small stores was 30 employees. Our results show that in big stores the reduction in the increase in store sales per hour worked [ATT=-0.041, $p<0.05$] and per square meter [ATT=-0.194, $p<0.01$] due to managerial turnover was higher than in small stores [ATT=-0.014, $p<0.10$; ATT=-0.097, $p<0.05$, respectively]. To further validate H2 we ran a test for equal average treatment effects in the two groups. Results for both outcome variables [sales per hour worked: $t=42.76$, $p<0.01$; sales per squared meter : $t=52.77$, $p<0.01$] lead to a rejection of the hypothesis and, therefore, H2 is supported. As a check for robustness we also split the sample using the average number of employees (27). The empirical results (in Table B1 of Appendix B) do not change significantly, leading to the same conclusion.

In analyzing employment systems, we used the mean of the percentage of sales assistants with a part-time contract (0.29) as the cut-off value to differentiate stores under primary (below the mean) and secondary (above the mean) systems. The results indicate that in stores where the primary employment system is predominant, managerial turnover does reduce the increase in store sales per hour worked [ATT=-0.019, $p<0.10$] and per square meter [ATT=-0.136, $p<0.01$], whereas in stores where the secondary employment system is more prevalent, the impact estimates of managerial turnover are numerically quite low or even positive [ATT=0.004, $p>0.10$; ATT=-0.012, $p>0.10$, respectively]. In this latter case, ATTs are not statistically different from 0 for both store-performance indicators. These results provide support for H3.

Regarding the brand condition, we classified stores into two groups according to their service orientation, as it is described in the variable section. The estimates indicate a higher change in total sales per square meter for the most service-oriented brands [most service-oriented: ATT=-0.139, $p<0.05$; less service-oriented: ATT=-0.082, $p<0.05$, t-statistics for equal ATT in the two groups: -31.92, $p<0.01$], whereas results do not show the same pattern

between brands in terms of the change in total sales per hour worked [most service-oriented: $ATT=-0.014$, $p>0.10$; less service-oriented: $ATT=-0.018$, $p<0.05$]. Thus, hypothesis H4 is partially supported.

We drew upon the EPL index developed by OECD to measure the moderating effect of different employment labor regulations across locations. We split the sample according to the mean value of the index (2.57). ATT estimates show that the more restrictive the labor market regulation, the larger the impact of managerial turnover regardless of the outcome indicator used. Specifically, if we consider the change in store sales per hour worked, the impact estimate for countries with more restrictive legislation is low and statistically significantly different from 0 [More restrictive: $ATT -0.028$, $p<0.01$; Less restrictive: $ATT=-0.019$, $p>0.10$]. Likewise with change in store sales per square meter, the results indicate that in countries where labor market legislation is more restrictive, the negative impact of managerial turnover is stronger and more significant than in countries with less restrictive regulation [More restrictive: $ATT -0.124$, $p<0.01$; Less restrictive: $ATT=-0.107$, $p\geq 0.10$]. Thus, H5 is supported.

Robustness check

It is possible that the number of store managers may influence both store performance and the propensity of having voluntary managerial turnover. To test that possibility we included the number of managers as an additional matching variable in the estimation of the propensity score, i.e., in the probability of having a voluntary managerial turnover. The results, presented in Table C1 of Appendix C, show that it is not significant. This is not surprising if we take into account that the number of store managers is highly correlated with store size and that the correlation between the number of managers and having a voluntary manager turnover is low (Table A2). To test the impact on store performance, we added the number of managers as an additional variable in the matching process in all of the analyses. These new

results, presented in Tables C2 to C4, show that all empirical results remain the same as when the number of managers is not included, thus providing robustness to our findings.

Discussion

For many years, turnover scholars have recognized that context can explain conflicting and abnormal research findings regarding how turnover diminishes firm effectiveness. However, the impact of context is still underappreciated, resulting in ongoing calls for context-specific investigations of turnover (e.g., Hausknecht, 2017; Hom et al., 2017; Lee et al., 2017). Our research connects organizational performance and turnover through a comprehensive examination of organizational context on the relationship between voluntary managerial turnover and unit performance.

Our results shows that voluntary managerial turnover affects store performance in a negative and significant way. Nevertheless, our findings also demonstrate that this relationship is dependent on several contextual factors. The empirics using different moderators do not always suggest a significant negative association between managerial turnover and unit performance. The negative effect of managerial turnover is significant for primary employment systems; but it is almost nonexistent for secondary employment systems. Also, the negative effect of managerial turnover is severe in countries with more restrictive EPL, but minor in countries with low EPL. Likewise, our results reveal that managerial turnover causes significant disruptions for stores with more than 30 employees or brands operating with higher levels of service orientation. Although it remains important, this effect weakens for stores with fewer than 30 employees or more service-oriented brands. Finally (and further validating the moderating effect of context), we examine the impact of managerial turnover on two relevant store performance outcomes: change in sales per hour worked and change in sales per square meter. Most results show a similar pattern across our two unit-performance measures, thus providing robustness to our findings.

At a quantitative level, our results show that store size exerts the biggest influence on the change in sales per hour, followed by the employment system, the industry service orientation, and the labor market regulation. When the focus is on the change in sales per hour worked, store size remains the factor with the highest moderation effect, followed by the labor market regulation, the employment system, and the industry service orientation.

Theoretical Implications

Building on previous studies (Hancock et al., 2013; Park & Shaw, 2013), we offer a comprehensive theoretical framework for understanding how organizational context shapes the managerial turnover–performance link. The study of managers extends turnover research by isolating the effects of departures of relatively valuable groups (core employees) and providing new insights about contextual factors that mitigate or exacerbate the negative impacts of managerial turnover. In their review of one hundred years of employee-turnover literature, Hom et al. (2017) note that most theories are applied to entire populations. The researchers wonder whether turnover theories "apply differently across different ranges of employee population" (p. 540). In the same vein, other studies suggest using a specific category of employees to examine the moderation effect because it might vary between employees and managers (Lee et al., 2017). We thus refine the nature and causality of the relationship between managerial turnover and performance by investigating losses associated to firm-specific tacit knowledge (human capital) along with losses of coordination and social connections within and outside the organization (social capital).

Most turnover–performance research predicts a linear and negative relationship between turnover and organizational performance (Park & Shaw, 2013; Shaw, 2011; Shaw et al., 2005b), suggesting that managerial quits are especially harmful (Hale et al., 2016; Hausknecht & Holwerda, 2013; Kacmar et al., 2006; Staw, 1980;). The most common assumption is that turnover entails human and social capital losses that portend a range of negative outcomes in

productivity or customer services (Price, 1977; Shaw et al., 2005a; Staw, 1980). However, our findings reveal that certain characteristics of organizational context buffer the negative impact of managerial turnover. For example, secondary employment systems have more routinized operations, so careful employee selection and career development are not allotted as much importance. Small units that manage a reduced variety of products will put less emphasis on human or social capital as a driver of organizational performance. Likewise, companies with a low level of service orientation, or companies existing in a low EPL environment, put a lower role of employee in the execution of tasks. Several studies have shown the lack of negative linear effects of turnover on performance outcomes, as outlined by Park and Shaw (2013). Our study helps explain why this is so, by analyzing four important contextual factors: unit size, employment system, brand, and location.

Consistent with our expectations, the results clearly show that organizational size is a significant moderator of the managerial turnover–performance relationship. According to Hausknecht et al. (2009), larger stores exhibit a stronger negative relationship between managerial turnover and performance than smaller ones, suggesting that managing complex environments may create not only losses of firm-specific tacit knowledge, but also greater difficulties with coordination and motivation. Our study did not find support for a diminishing effect of unit size on the negative relationship between managerial turnover and performance such as other authors have argued (Green et al., 1996; Kozlowski & Bell, 2003; Park & Shaw, 2013). Although this is an interesting finding, it has to be understood within the context of our study, a cross-organization dataset where multiple units share common principles and practices, and issues and sources of extraneous variance can be controlled.

Regarding the employment system as a moderator, we do find that the negative effect of managerial turnover on performance is stronger for stores under primary employment systems than for stores under secondary ones (Hypothesis 2). This result supports extant findings that

an emphasis on human resource management systems moderates the turnover–performance link (e.g., Arthur, 1994; Guthrie, 2001; Shaw, Gupta, & Delery, 2005). Human and social capital losses through managerial turnover are greater under primary employment systems than secondary ones because new managers take more time to reach adequate performance levels. Additionally, when a manager leaves, employees experience a reduced sense of commitment, endangering their own continuity in the organization.

When considering service orientation as a moderator, our results show that managerial turnover affects store performance in a more pronounced negative way in terms of sales per square meter in more service-oriented brands. This finding suggests that in brands with higher labor intensity, managers play a critical role in building a human and social structure that guarantees knowledge integration or coordination of individuals to offer customers the desired products or services. At less service-oriented stores, where employees are less dependent on knowledge directly related to day-to-day customer service and more dependent on operating procedures, the negative effect of managerial turnover on performance is lower. This finding is consistent with prior research showing that in less service-oriented brands it is easier to transfer knowledge to new managers, and the disruption of existing routines following a manager departure is small (Argote, 2012; Ton & Huckman, 2008). However, we found no support for our expectation of more pronounced negative effects of managerial turnover for more service-oriented brands in terms of sales per hour worked. We suggest that procedures may be a necessary but not sufficient condition to mitigate the negative effects of managerial turnover. In the context of our study, even though operating procedures are designated by the brand's corporate office, compliance with procedures depends on the store manager. To the extent to which the store manager enforces procedures, stores will be less negatively affected by managerial turnover (Ton & Huckman, 2008).

Finally, we examined location based on labor market regulations. Our analysis of EPL indicates that location moderates the managerial turnover–performance relationship such that negative effects are particularly severe for countries with more restrictive employment protection legislation. This result provides support for Hypothesis 4 and concurs with previous literature suggesting interdependences between hiring and firing. Firing costs not only affect firing but also hiring, as strict EPL encourages firms to invest in specific human capital to avoid costly layoffs (Holmlund, 2014). On the other side, because organizations operating under more strict labor market regulations may have norms (e.g., centralized or institutionalized wage settings) that increase turnover of better performers and make it more difficult to fire lower employees, our results also extend earlier studies by raising new questions about an indirect dysfunctional side of strict employment policies.

Practical Implications

Our study also offers opportunities for influencing managerial behavior. Practitioners intuitively know that the impact of managerial turnover is particularly harmful, but this has seldom been empirically demonstrated. Our findings allow for a monetization of this phenomenon. In the case of our study sample, the average increase of sales per hour worked for the stores with managerial turnover is 4.26% whereas for the stores without managerial turnover it raises to 6.24%. The corresponding figures for the average increase in the sales per square meter are 11.22% and 21.15% respectively. Therefore, investments in store managers' retention are warranted. Similarly, our results suggest that there may be an optimal unit size that minimizes the impact of managerial turnover on performance. Given the economic impact of this phenomenon, company officers should take staff size into consideration in order to gauge store dimensions. In addition, the finding that managerial turnover significantly affects the performance of stores under primary employment systems suggests the need to redouble

efforts to retain unit managers, given the pivotal role they may play in successful implementation of commitment-based HR practices.

Important implications also concern the distinct effect of managerial turnover according to the level of service orientation of the units. Our findings may provide HR officers with arguments to invest in retention when units are more service oriented, since firm-specific skills are concentrated in managerial roles with responsibility for important knowledge transfer and coordination issues. As far as our study shows, managerial turnover has a relevant negative impact over sales but does not necessarily affect store processes (which are accounted for in the productivity measure that did not render significant results). This result outlines the dimensions of intangibility, co-terminality, and human resources intensity that characterize service-oriented firms and points to managerial retention as a key factor insofar as managers represent a role model for interacting with customers and guarantee collective behaviors aligned with the company's service standards.

Our results also suggest that the departure of managers is more harmful in countries with more protectionist labor regulations. When compared with countries with looser legislation, the differential impact of managerial turnover on sales increase can reach 10%. Although intervening over the regulatory context or national cultural characteristics is obviously out of the scope of business organizations, these results inform multinational corporate managers about the need to deploy alternative recruiting or retention strategies in stores operating under strict employment protection laws and in more cohesive social systems.

Limitations and Future Research Directions

Our study is subject to several limitations which in turn offer opportunities for future research. As with any study our results must be considered in light of the research sample and data. Although our results, derived from a multinational and multi-brand company, have the

advantage of offering a better understanding of the relationship between managerial turnover and performance by controlling for sources of extraneous variance and ensuring consistent definitions and measurement, cross-organization samples could offer other advantages such as the exploration of industry dynamic as a contextual moderator. Likewise, using company records for our measurements limited the variables that could be studied. To examine the potential bias of using company records, future research could have more flexibility in defining variables. Alternative metrics that move beyond simple rates and identify, for example, ways to track “qualities” of departures are perhaps more indicative of turnover’s consequences than a simple quantitative count (Hausknecht, 2017). Another research direction is to better understand the consequences of turnover on other types of outcomes such as innovation. The literature recognizes certain benefits of turnover but most of these remain unstudied.

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Table 1. Logit Estimation of Propensity Score

	Coef.	Std. Err.
Low service-intensity brand	-0.558***	0.127
Size	0.339***	0.089
Total staff turnover	4.852***	0.311
Store age	-0.036*	0.021
Employment system	-0.455***	0.166
Regional unemployment rate	-5.381***	1.145
Labor market regulation (EPL)	-0.926***	0.132
Culture (Globe index)	-0.230**	0.094
Sales 2015	-0.055**	0.028
Hours worked 2015	0.021***	0.006
Constant	1.254**	0.621
N	4002	
Pseudo R2	0.2522	
Log likelihood	-2023.0	
LR test (p.valor)	1364.28	(0.00)

* p<0.1; **p<0.05, ***p<0.01

Table 2. Diagnostic Statistics for One-To-One Nearest Matching Procedure (NN(1))

Variable	Sample	Mean		%bias(b)	%reduct	t-test(a)	p-value	Variance Ratio(c)
		Treated	Control					
Low service-intensity brand	Unmatched	0.50	0.55	-9.7		-3.01	0.003	0.97
	Matched	0.51	0.52	-3.3	65.5	-0.94	0.346	1.01
Size	Unmatched	35.07	22.55	51.3		16.46	0.000	1.74*
	Matched	34.13	35.31	-4.9	90.5	-1.18	0.236	0.97
Total staff turnover	Unmatched	0.56	0.41	92.8		28.53	0.000	1.09
	Matched	0.56	0.54	-3.2	96.6	-0.91	0.361	0.92
Store age	Unmatched	6.94	9.30	-44.3		-13.6	0.000	0.78*
	Matched	6.94	6.90	0.8	98.2	0.23	0.814	0.95
Employment system	Unmatched	0.16	0.39	-60.8		-18.41	0.000	0.51*
	Matched	0.16	0.16	-0.7	98.8	-0.24	0.811	0.96
Sales 2015	Unmatched	3.16	2.27	26.7		8.6	0.000	2.13**
	Matched	3.05	3.18	-3.8	85.5	-0.94	0.348	1.05
Hours worked 2015	Unmatched	31.04	21.79	36.9		11.94	0.000	2.26**
	Matched	30.15	30.88	-2.9	92.2	-0.72	0.472	1.1
Regional unemployment rate	Unmatched	0.08	0.13	-88.3		-27.07	0.000	0.76*
	Matched	0.08	0.08	-2.5	97.2	-0.76	0.447	0.98
Labor market regulation (EPL)	Unmatched	2.43	2.67	-67.8		-22.07	0.000	1.84*
	Matched	2.45	2.47	-6.5	90.4	-1.58	0.115	1.00
Culture	Unmatched	5.32	5.38	-10.8		-3.49	0.000	2.14**
	Matched	5.34	5.37	-4.5	58.4	-1.13	0.258	1.05

(a) t-test for equal means between treated and control samples. P-values<0.10 indicate significant mean differences at 10%. Values>0.10 indicate not significant differences; (b) Standardized percentage bias; (c) Rubin variance ratio between treated and control samples. * variable "of concern" ** variable "bad." After the matching procedure the mean differences vanish and the variance ratios are close to 1.

Region of common support [0.0363-0.99116] ; 29 stores out of common support.

Table 3. Average Treatment Effect on the Treated Estimates

	ATT	t- statistic	Diagnostic Statistics							
			Pseudo R ^{2(a)}	LR Test ^(b)	p>chi2 ^(b)	Mean Bias ^(c)	MedianBias ^(c)	Rubin B ^(d)	Rubin R ^(d)	Out of Common Support ^(e)
Unmatched sample			0.252	1364.28	0.000	40.6	36.9	130.1	1.2	
Matched sample: NN (1x1)										
Change in sales per hour worked	-0.019**	-2.50	0.004	13.08	0.288	3.1	3.2	14.8	1.1	29
Change in sales per m2	-0.099***	-2.93								
Matched sample: NN (5x1)										
Change in sales per hour worked	-0.014**	-2.05	0.002	7.20	0.782	3.1	2.2	11.7	1.05	86
Change in sales per m2	-0.087***	-2.88								

(a) Pseudo R2 of propensity score model; (b) Likelihood ratio test of insignificance of all regressors and p-value; (c) Mean and Median bias are summary indicators of the distribution of the abs(bias); (d) The recommended values for samples to be considered sufficiently balanced are B less than 25 and R between 0.5 and 2 (Rubin, 2001); (e) Stores out of common support.

* p<0.1; **p<0.05, ***p<0.01

Table 4. Average Treatment Effect on the Treated Estimates for Contextual Factors

	ATT	t-statistic	Diagnostic Statistics							Out of common support ^(e)
			Pseudo R ^{2(a)}	LR Test ^(b)	p>chi2 ^(b)	Mean Bias ^(c)	MedianBias ^(c)	Rubin B ^(d)	Rubin R ^(d)	
<i>Size</i>										
<i>Small (N=2909)</i>										
Change in sales per hour worked	-0.014*	-1.92	0.005	12.63	0.318	3.4	2.3	15.8	1.36	14
Change in sales per m2	-0.097**	-2.42								
<i>Large (N=1093)</i>										
Change in sales per hour worked	-0.041**	-2.01	0.003	5.64	0.845	3.2	3.6	13.8	0.9	15
Change in sales per m2	-0.194***	-3.49								
<i>Employment system</i>										
<i>Primary (N=2599)</i>										
Change in sales per hour worked	-0.018*	-1.84	0.008	14.36	0.157	5.9	5.3	21.3	1.01	22
Change in sales per m2	-0.137***	-2.85								
<i>Secondary (N=1403)</i>										
Change in sales per hour worked	0.004	0.61	0.004	3.74	0.958	3.9	3.1	15.7	1.09	27
Change in sales per m2	-0.012	0.39								
<i>Brand</i>										
<i>High intensity service (N=1883)</i>										
Change in sales per hour worked	-0.014	-0.97	0.006	12.33	0.264	3.7	2.9	17.8	1.02	35
Change in sales per m2	-0.139**	-2.06								
<i>Low intensity service (N=2119)</i>										
Change in sales per hour worked	-0.018*	-1.94	0.002	5.36	0.718	3.9	4	11.5	1.21	4
Change in sales per m2	-0.082**	-2.03								

Labor market regulation (EPL)

Less restrictive (N=1319)

Change in sales per hour worked	-0.019	-1.01	0.008	16.09	0.187	5	5.6	20.9	1.1	28
Change in sales per m2	-0.107	-1.64								

More restrictive (N=2683)

Change in sales per hour worked	-0.028***	-3.61	0.002	4.80	0.964	2.1	1.8	11.5	1.05	9
Change in sales per m2	-0.124***	-3.38								

(a) Pseudo R2 of propensity score model; (b) Likelihood ratio test of insignificance of all regressors and p-value; (c) Mean and Median bias are summary indicators of the distribution of the abs(bias); (d) The recommended values for samples to be considered sufficiently balanced are B less than 25 and R between 0.5 and 2 (Rubin, 2001); (e) Treated observation out of common support.

* p<0.1; **p<0.05, ***p<0.01

Appendix A. Statistical descriptives and correlation matrix

Table A1. Descriptive Statistics

	Mean	Standard Deviation	N
<i>Treatment</i>			
Managerial voluntary turnover	0.4075	0.4914	4002
<i>Outcomes</i>			
Change in sales per hour worked	0.0337	0.1348	4002
Change in sales per m2	0.1173	0.5448	4002
<i>Matching variables</i>			
Low service-intensity brand	0.5295	0.4992	4002
Size	27.0892	27.9199	4002
Number of managers	2.4718	1.7793	4002
Total staff turnover	0.4755	0.1792	4002
Store age	8.3353	5.5205	4002
Employment system	0.2930	0.3983	4002
Sales 2015	2.6343	3.2512	4002
Hours worked 2015	25.5573	24.5148	4002
Regional unemployment rate	0.1092	0.0636	4002
Labor market regulation (EPL)	2.5717	0.3623	4002
Culture (Globe index)	5.3566	0.4856	4002
<i>Dichotomized contextual factors</i>			
Dichot. size	0.2731	0.4456	4002
Dichot. employment system	0.3506	0.4772	4002
Low service-intensity brand	0.5295	0.4992	4002
Dichot. labor market regulation (EPL)	0.6704	0.4701	4002

Table A2. Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Managerial Voluntary Turnover	1																	
2 Change in sales per hour worked	0.0572	1																
3 Change in sales per m2	-0.0056	0.6136	1															
4 Low Service Intesity Brand	-0.0475	-0.161	-0.0637	1														
5 Size	0.2412	0.1165	0.0098	-0.365	1													
6 Number of managers	0.043	0.0884	-0.0493	-0.2999	0.6064	1												
7 Total Staff turnover	0.4113	0.0143	0.0185	0.1368	0.1085	-0.1663	1											
8 Store Age	-0.2102	-0.1944	-0.2172	-0.0876	0.0906	0.1646	-0.2715	1										
9 Employment System	-0.2795	-0.1224	-0.0642	0.0795	-0.1964	-0.1722	-0.0953	0.3489	1									
10 Sales 2015	0.1347	-0.0105	-0.0732	-0.3959	0.8881	0.551	-0.0408	0.1711	-0.1672	1								
11 Hours worked 2015	0.1856	0.0826	-0.0684	-0.4135	0.9418	0.5796	0.0127	0.1349	-0.1798	0.9379	1							
12 Regional Unemployment Rate	-0.3932	-0.0796	-0.059	0.0473	-0.1736	-0.1391	-0.3565	0.4484	0.7234	-0.0926	-0.1359	1						
13 Labour Market Regulation (EPL)	-0.3294	-0.0821	-0.0131	0.1093	-0.2764	-0.1968	-0.2349	0.1997	0.2616	-0.1213	-0.2148	0.4026	1					
14 Culture (Globe index)	-0.0551	-0.0679	-0.0772	0.2015	-0.2999	-0.2286	0.1023	-0.0938	0.191	-0.3326	-0.2219	0.023	0.1807	1				
15 Dichot. Size	0.1844	0.1539	0.0277	-0.4525	0.7094	0.5023	0.0342	0.0873	-0.1897	0.6649	0.7241	-0.1568	-0.176	-0.2893	1			
16 Dichot. Employment System	-0.2683	-0.1272	-0.0701	0.0788	-0.1951	-0.1701	-0.0895	0.3428	0.9545	-0.167	-0.1767	0.6789	0.2562	0.2049	-0.1918	1		
17 Low Service Intesity Brand	-0.0475	-0.161	-0.0637	1	-0.365	-0.2999	0.1368	-0.0876	0.0795	-0.3959	-0.4135	0.0473	0.1093	0.2015	-0.4525	0.0788	1	
18 Dichot. Labour Market Regulation	-0.3239	-0.1431	-0.0023	0.0547	-0.2049	-0.2506	-0.217	0.2132	0.5157	-0.0571	-0.1492	0.5112	0.7774	0.164	-0.1333	0.5152	0.0547	1

Appendix B. Robust check. Moderation effect of size using as a cutoff value 27 employees

	ATT	t-statistic	Diagnostic Statistics							
			Pseudo R ^{2(a)}	LR Test ^(b)	p>chi2 ^(b)	Mean Bias ^(c)	MedianBias ^(c)	Rubin B ^(d)	Rubin R ^(d)	Out of common support ^(e)
<i>Size</i>										
<i>Small (N=2796)</i>										
Change in sales per hour worked	-0.018**	-2.29	0.003	6.77	0.817	2.6	1.8	11.8	1.13	9
Change in sales per m2	-0.105***	-2.85								
<i>Large (N=1206)</i>										
Change in sales per hour worked	-0.041**	-2.06	0.006	9.78	0.460	3.5	2.9	17.5	1.02	17
Change in sales per m2	-0.194***	-3.17								

(a) Pseudo R2 of propensity score model; (b) Likelihood ratio test of insignificance of all regressors and p-value; (c) Mean and Median bias are summary indicators of the distribution of the abs(bias); (d) The recommended values for samples to be considered sufficiently balanced are B less than 25 and R between 0.5 and 2 (Rubin, 2001); (e) Treated observation out of common support.

* p<0.1; **p<0.05, ***p<0.01

Appendix C. Robust check. Inclusion of the number of store managers as a matching variable.

Table C1. Logit Estimation of Propensity Score

	Coef.	Std. Err.
Low service-intensity brand	-0.570***	0.128
Size	0.401***	0.095
Number of managers	0.020	0.019
Total staff turnover	4.726***	0.283
Store age	-0.030*	0.017
Employment system	-0.397**	0.172
Sales 2015	-0.063**	0.032
Hours worked 2015	0.024***	0.006
Regional unemployment rate	-5.898***	1.144
Labor market regulation (EPL)	-0.845**	0.405
Culture (Globe index)	-0.208**	0.099
Constant	1.208**	0.562
N	4002	
Pseudo R2	0.2531	
Log likelihood	-2019.5	
LR test (p.valor)	1369.33 (0.00)	

* p<0.1; **p<0.05, ***p<0.01

Table C2. Diagnostic Statistics for One-to-one Nearest Matching Procedure (NN(1))

Variable	Sample	Mean		%bias(b)	%reduct bias	t-test(a)	p-value	Variance Ratio(c)
		Treated	Control					
Low service-intensity brand	Unmatched	0.5009	0.5491	-9.7		-3.01	0.003	0.98
	Matched	0.5069	0.5033	0.7	92.7	0.2	0.842	1.01
Size	Unmatched	35.0670	22.5460	51.3		16.46	0.000	1.82*
	Matched	34.3080	34.9490	-2.6	94.9	-0.65	0.515	1.04
Number of managers	Unmatched	2.5641	2.4083	8.4		2.72	0.006	2.24**
	Matched	2.5374	2.5225	0.2	97.4	1.21	0.227	1.07
Total staff turnover	Unmatched	0.5643	0.4144	92.8		28.53	0.000	1.01
	Matched	0.5618	0.5608	0.6	99.3	0.18	0.857	0.93
Store age	Unmatched	6.9362	9.2978	-44.3		-13.6	0.000	0.78*
	Matched	6.9452	6.7621	3.4	92.2	1.04	0.299	0.99
Employment system	Unmatched	0.1588	0.3854	-60.8		-18.41	0.000	0.51*
	Matched	0.1613	0.1675	-1.7	97.2	-0.56	0.574	0.98
Sales 2015	Unmatched	3.1623	2.2710	26.7		8.6	0.000	2.13**
	Matched	3.0191	3.0534	-1.0	96.2	-0.27	0.785	0.97
Hours worked 2015	Unmatched	31.0410	21.7850	36.9		11.94	0.000	2.25**
	Matched	29.9030	29.9770	-0.3	99.2	-0.08	0.937	0.96
Regional unemployment rate	Unmatched	0.0790	0.1299	-88.3		-27.05	0.000	0.73*
	Matched	0.0795	0.0806	-1.9	97.9	-0.57	0.569	0.96
Labor market regulation (EPL)	Unmatched	2.4278	2.6706	-67.8		-22.07	0.000	1.81*
	Matched	2.4448	2.4614	-4.6	93.2	-1.11	0.269	0.81
Culture	Unmatched	5.3244	5.3788	-10.8		-3.49	0.000	2.14**
	Matched	5.3410	5.3404	0.1	99.0	0.03	0.978	0.99

(a) t-test for equal means between treated and control samples. P-values<0.10 indicate significant mean differences at 10%. Values>0.10 indicate not significant differences; (b) Standardized percentage bias; (c) Rubin variance ratio between treated and control samples. * variable "of concern" ** variable "bad"

Region of common support [.03676, .99928]; 22 stores out of common support.

Table C3. Average Treatment Effect on the Treated Estimates

	ATT	t-statistic	Diagnostic Statistics							
			Pseudo R ^{2(a)}	LR Test ^(b)	p>chi2 ^(b)	Mean Bias ^(c)	MedianBias ^(c)	Rubin B ^(d)	Rubin R ^(d)	Out of common support ^(e)
Unmatched sample			0.2531	1369.33	0.000	45.2	44.3	128.2	1.23	
Matched sample: NN (1x1)										
Change in sales per hour worked	-0.016**	-2.03	0.009	12.883	0.301	1.7	1.3	13.8	1.01	22
Change in sales per m2	-0.089***	-2.73								
Matched sample: NN (5x1)										
Change in sales per hour worked	-0.013**	-1.99	0.010	11.244	0.423	3.1	2.2	12.7	1.04	80
Change in sales per m2	-0.079***	2.61								

(a) Pseudo R2 of propensity score model; (b) Likelihood ratio test of insignificance of all regressors and p-value; (c) Mean and Median bias are summary indicators of the distribution of the abs(bias); (d) The recommended values for samples to be considered sufficiently balanced are B less than 25 and R between 0.5 and 2 (Rubin, 2001); (e) Treated observation out of common support.

* p<0.1; **p<0.05, ***p<0.01

Table C4. Average Treatment Effect on the Treated Estimates for Contextual Factors

	ATT	t-statistic	Diagnostic Statistics							Out of common support ^(e)
			Pseudo R ^{2(a)}	LR Test ^(b)	p>chi2 ^(b)	Mean Bias ^(c)	MedianBias ^(c)	Rubin B ^(d)	Rubin R ^(d)	
<i>Size</i>										
<i>Small (N=2909)</i>										
Change in sales per hour worked	-0.015*	-1.92	0.006	13.57	0.257	2.9	2.3	10.8	1.04	12
Change in sales per m2	-0.089***	-3.87								
<i>Large (N=1093)</i>										
Change in sales per hour worked	-0.036**	-1.97	0.005	6.87	0.809	3.1	3.9	14.1	0.71	18
Change in sales per m2	-0.155***	-3.45								
<i>Employment system</i>										
<i>Primary (N=2599)</i>										
Change in sales per hour worked	-0.018*	-1.82	0.009	15.82	0.147	7.2	6.4	22.2	1.18	21
Change in sales per m2	-0.121***	-3.03								
<i>Secondary (N=1403)</i>										
Change in sales per hour worked	-0.002	0.61	0.007	6.19	0.86	4.3	3.5	19.8	0.97	22
Change in sales per m2	-0.011	0.39								
<i>Brand</i>										
<i>High intensity service (N=1883)</i>										
Change in sales per hour worked	-0.005	-0.97	0.007	10.09	0.522	3.1	2.1	16.1	0.96	32
Change in sales per m2	-0.117**	-2.06								
<i>Low intensity service (N=2119)</i>										
Change in sales per hour worked	-0.014**	-2.48	0.004	8.04	0.709	3.1	1.7	14	1.28	3
Change in sales per m2	-0.079**	-2.22								
<i>Labor market regulation (EPL)</i>										
<i>Less restrictive (N=1319)</i>										

Change in sales per hour worked	-0.014	-0.71								
Change in sales per m2	-0.084	-1.13	0.010	16.05	0.139	5.3	6	21.9	1.2	29
<i>More restrictive (N=2683)</i>										
Change in sales per hour worked	-0.021***	-3.01								
Change in sales per m2	-0.109***	-3.38	0.004	5.19	0.921	2.5	1.7	11.4	0.89	6

(a) Pseudo R2 of propensity score model; (b) Likelihood ratio test of insignificance of all regressors and p-value; (c) Mean and Median bias are summary indicators of the distribution of the abs(bias); (d) The recommended values for samples to be considered sufficiently balanced are B less than 25 and R between 0.5 and 2 (Rubin, 2001); (e) Treated observation out of common support.

* p<0.1; **p<0.05, ***p<0.01