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Does Losing Temporary Workers Matter? The Effects of Planned Turnover on Replacements and Unit Performance

Federica De Stefano
University of Pennsylvania
fede@wharton.upenn.edu

Rocio Bonet
Instituto de Empresa Business School
Madrid, Spain
rocio.bonet@ie.edu

Arnaldo Camuffo
Bocconi University
Milan, Italy
arnaldo.camuffo@unibocconi.it

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DOES LOSING TEMPORARY WORKERS MATTER? THE EFFECTS OF PLANNED TURNOVER ON REPLACEMENTS AND UNIT PERFORMANCE

ABSTRACT

This study examines the performance consequences of planned turnover. In particular, we investigate the departure of temporary workers due to the expiration of their contracts. We reconcile the contradictory predictions of collective turnover research—that any type of worker's exit impairs organizational performance—and of contingent work research—that temporary workers' exits improve organizational performance because they provide flexibility. We argue that the planned turnover of temporary workers has an inverted U-shaped relationship with unit performance because it combines flexibility benefits and disruption costs. We also argue that the costs of planned temporary worker turnover are moderated by the proportion and the firm-specific experience of their replacements. We test these arguments using longitudinal monthly data from a leading multinational company in the food and beverage industry, and find support for our hypotheses. The study suggests that managers hiring temporary workers should consider the cost of losing them and challenges the widespread scholarly and managerial assumption that temporary workers are disposable resources.

Keywords: planned turnover, temporary workers, replacements, rehires

INTRODUCTION

Organizations today increasingly rely on temporary workers (Cappelli & Keller, 2013; Kalleberg, 2000). Differently from permanent employees, temporary workers sign a contract with a predetermined expiration date and therefore do not have an explicit or implicit agreement for long-term employment (Polivka, 1996). Existing research contends that such workers are valuable to their employer because they enable flexibility (Atkinson, 1984; Cappelli & Neumark, 2004; Osterman, 1987); firms can quickly respond to changing market conditions by hiring and terminating these workers without infringing legal or psychological contracts (Matusik & Hill, 1998). The underlying assumption of this stream of research is that there is no significant cost in externally churning temporary workers (Atkinson, 1984; Mangum, Mayall, & Nelson, 1985; Matusik & Hill, 1998).

This premise contrasts strikingly with the findings of an extensive turnover literature showing that workers' exits impair organizational performance (Hancock, Allen, Bosco, McDaniel, & Pierce, 2013; Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013; for recent reviews of this literature see Heavey, Holwerda, & Hausknecht, 2013; Hom, Lee,

Shaw, & Hausknecht, 2017; Park & Shaw, 2013; Shaw, 2011). This raises an interesting conundrum: does that impairment also apply to the planned exits of temporary workers, limiting or even offsetting the benefits of numerical flexibility? This study aims to reconcile these two competing views by analyzing the performance consequences of planned temporary worker turnover—that is, temporary workers' departures due to the expiration of their contracts.

Researchers studying contingent work have mostly focused on the effects of the presence of contingent workers in the unit (Broschak & Davis-Blake, 2006; Davis-Blake, Broschak, & George, 2003; George, Chattopadhyay, & Zhang, 2012; Kesavan, Staats, & Gilland, 2014) but neglected the consequences of their departure. Meanwhile, the vast turnover literature has deeply investigated the exits of permanent employees and has shown negative performance effects (Shaw, 2011) but has not addressed the effects of the planned departure of temporary workers, so that it is unclear whether the same negative performance effects apply in their case.

The purpose of this paper is to investigate the effect of temporary workers' departures due to the expiration of their contracts on unit financial performance. We argue that this kind of turnover has different antecedents and consequences than other types of workers' exits, such as downsizing, firings due to poor worker performance, or departures initiated by the workers. The departure of temporary workers due to the expiration of their contracts is a peculiar form of exit inasmuch it is planned by the employer and is expected by the temporary worker as well as by the other workers in the unit. In order to establish how these unique characteristics affect unit performance, we build on the Context-Emergent Turnover (CET) theory (Call, Nyberg, Ployhart, & Weekley, 2015; Nyberg & Ployhart, 2013) and on the capacity theory (Hausknecht & Holwerda, 2013) of collective turnover, which provide the obvious starting point for our investigation.

We predict and find an inverted U-shaped relationship between planned temporary worker turnover and unit performance. We posit that such planned turnover has both benefits due to flexibility and costs due to disruption, and argue that beyond a certain level of turnover, the costs of disruption outweigh the benefits of flexibility. We also argue and find that the costs of planned turnover are moderated by the proportion and the nature of temporary workers' replacements. The cost of terminating temporary workers increases with the proportion of replacements in the temporary workforce. However, skilled replacements with firm-specific experience are less disruptive than novices.

We test our predictions using longitudinal monthly data from 2007 to 2014 for the Italian units (bars and restaurants) of a leading multinational company providing food and beverage services for travelers.

This study has two major intended contributions. First, we explore a previously unexamined type of worker departure whose antecedents and consequences differ markedly from those of other types. In particular, we develop a theoretical account of the performance effects of the planned turnover originated when exits and replacements are decided by the manager for strategic purposes and expected by the workers who leave and by those who remain in the unit (Hausknecht & Holwerda, 2013). Second, by providing empirical evidence that the external churning of temporary workers has costs for the unit that employs them, we challenge the scholarly and managerial assumption that temporary workers are disposable resources who perform 'plug-in' jobs without firm-specific human capital (Atkinson, 1984; Cappelli & Neumark, 2004). Instead, we show that disposing of temporary workers significantly depletes the unit's collective human capital. Managers should evaluate the costs of this disruption when assessing the benefits of flexibility that temporary hiring brings.

THEORY AND HYPOTHESES

Temporary Workers and Flexibility

Organizations seek numerical flexibility, or the ability to adjust the number of workers they use, in order to meet fluctuations in demand (Kalleberg, 2000). One approach firms commonly follow to build this flexibility into their workforce is hiring temporary workers, or workers whose contracts have an expiration date (Cappelli & Neumark, 2004; Davis-Blake & Uzzi, 1993). Surveys of employers in and outside the United States report that flexibility is the main reason behind the use of these contracts (e.g., Houseman, 2001; Kalleberg, Reynolds, & Marsden, 2003). Existing research has also documented that the use of temporary workers is especially widespread when the fixed costs of hiring and dismissing make it more expensive to adjust permanent workers (Autor, 2003; Gramm & Schnell, 2001; Ono and Sullivan, 2013).

The expiration of temporary contracts at the end of a period allows the employer to readjust the size of its workforce with the company needs and to eliminate underutilized capacity in the unit when demand shrinks. When a temporary contract expires, the manager of the unit has the opportunity to reassess whether or not she needs to fill the vacant position. If remaining workers are sufficient to satisfy the staffing requirements, then no replacements are hired into the unit. If demand calls for an extra worker, the manager can either renew the temporary contract or hire a new worker on a temporary basis. In this way, the organization attains flexibility by externally churning temporary workers who come and go according to its staffing needs (Mangum et al., 1985; Matusik & Hill, 1998). Differently from permanent workers, temporary workers thus operate under explicit restrictions on the duration of their employment (Broschak & Davis-Blake, 2006; Polivka, 1996).

Temporary contracts can assume different forms and durations depending on the organizational needs for flexibility: they can be seasonal contracts that satisfy staffing needs during seasonal peaks, usually anticipated by the employer, or they can be contracts that the

organization uses regularly to be more adaptable in case of an unexpected change in the environment (Cappelli & Keller, 2013).

Planned Temporary Worker Turnover

The expiration of temporary contracts generates a unique type of worker departures. Unlike voluntary turnover, temporary workers' exits are anticipated by the manager because the expiration date of the contracts is pre-determined at the moment of hiring. Therefore, the unit manager can plan for replacements in advance, mitigating the risk of leaving the unit understaffed.

Planned temporary worker turnover differs from downsizing, which is also planned by the employer (Cascio, 2002), in that temporary contracts do not create expectations for long-term employment, and terminating them should therefore have no effects on the commitment of the remaining employees (Datta, Guthrie, Basuil, & Pandey, 2010; Trevor & Nyberg, 2008).

It also differs from dismissals, that firms use to correct 'false positives' in the hiring process (Siebert & Zubanov, 2009) by eliminating poor matches and poor performers (Batt & Colvin, 2011). The positive performance consequences of dismissals (Shaw, Delery, Jenkins, & Gupta, 1998) do not necessarily apply to the expiration of temporary workers' contracts, because the expiration date is set at the time of hiring, regardless of the worker's subsequent performance.

In the next section, we argue that there are unique benefits that apply to planned temporary worker turnover because of the flexibility that it enables. However, we also contend that the departure of these workers entails operational costs. Against the prevailing view that temporary workers are disposable resources (Atkinson 1984; Cappelli and Neumark 2004), we argue that externally churning temporary workers is indeed costly for the organization because it disrupts the work routines of those remaining in the unit.

The Benefits and Costs of Planned Temporary Worker Turnover

The planned turnover of temporary workers has benefits and costs for the performance of the unit. The expiration of temporary contracts allows the employer to optimize the workforce size. For instance, if demand is shrinking, the employer can easily avoid the costs of paying wages for excess workers (Lecuona & Reitzig, 2014), without engaging in the costlier process of firing permanent workers. Moreover, reducing human resource slack can make workers more responsive in several ways. It may help to prevent inertia and rigidity in how workers perform their jobs and in how they respond to changes in demand (Mishina, Pollock, & Porac, 2004; Voss, Sirdeshmukh, & Voss, 2008). It may improve efficiency (Kc & Terwiesch, 2009) and sales (Tan & Netessine, 2014), provided that the increase in workload and time pressures for the remaining workers is moderate. Being able to adjust the workforce can be particularly valuable in seasonal industries and in industries with relatively uncertain demand (Cappelli & Keller, 2013; Houseman, 2001).

On the cost side, planned temporary worker turnover entails operational disruption in the unit (Fisher & Connelly, 2017; Hausknecht & Holwerda, 2013). Research on the performance consequences of permanent worker turnover has found that collective turnover, defined as the "aggregate levels of employee departures that occur within groups, work units, or organizations" (Hausknecht & Trevor, 2011: 353) can significantly impair unit performance (Reilly, Nyberg, Maltarich, & Weller, 2014). Numerous papers have underscored that the exits and replacements generate coordination and communication breakdowns, slow down organizational learning, and destabilize routines (Argote & Epple, 1990; Dess & Shaw, 2001; Kacmar, Andrews, Van Rooy, Steilberg, & Cerrone, 2006; Staw, 1980; Watrous, Huffman, & Pritchard, 2006). However, other studies contend that because both the employer and the workers expect the relationship to be short-term, both parties invest limited resources in each other. Therefore, the departure of temporary workers should imply only moderate losses of firm-specific human capital, and replacements should quickly reach

the performance levels of departing employees (Shaw, Gupta, & Delery, 2005; Siebert & Zubanov, 2009). In this situation, existing theories of collective turnover suggest that the costs of turnover are negligible (Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013) and should be outweighed by the benefits of flexibility. We challenge this view by arguing that temporary workers do accumulate firm-specific human capital, and therefore, as in the case of permanent workers, their departure can disrupt unit operations.

Research has shown that workers hired on a temporary basis often work alongside other workers in the unit (e.g., Bidwell, 2009; Davis-Blake et al., 2003; Smith, 2001). Therefore, the departure of temporary workers will force the remaining workers to reorganize the way work is done in the organization and to find new routines to accomplish their tasks (Hale, Ployhart, & Shepherd, 2016). As a result, customer wait time typically increases leading to negative effects on quality (via reduced customer satisfaction) and sales (via lower table turnover). This is particularly problematic in our setting where being served on time is a crucial factor of success in the restaurants or bars since the typical customers are time-pressed travelers. Disruption costs are expected to increase with the planned turnover of temporary workers at an increasing rate. For low levels of turnover, units may be able to shield the workers who are marginally more valuable, such as those in customer-facing tasks, from increases or changes in their work activities. However, at high levels of turnover, it is more likely that even those workers are asked to engage in new or more tasks and are thus affected by the departure of temporary workers.

The combination of these benefits and costs suggests a nonlinear relationship between planned temporary worker turnover and performance. Specifically, we propose an inverted U-shaped relationship. We expect that low to moderate levels of planned turnover have a positive effect on performance. Some planned turnover is good because it allows the unit to adjust its number of workers to demand: the benefits of reducing payrolls and slack resources

outweigh the costs. But beyond an optimal level of planned turnover, the costs of disruption for the remaining workers in the unit will exceed the benefits of flexibility.

We therefore propose:

Hypothesis 1. The planned turnover of temporary workers has an inverted U-shaped relationship with unit performance.

Planned Temporary Worker Turnover and the Proportion of Replacements in the Temporary Workforce

When organizations use temporary workers to achieve numerical flexibility, they make both entries and exits of workers more flexible. After temporary contracts expire, the unit's manager can restore the unit productive capacity by replacing the terminated workers with other temporary workers. Existing research on numerical flexibility not only assumes that losing temporary workers is costless, but also that integrating new temporary workers does not disrupt the unit performance (Atkinson, 1984; Cappelli & Neumark, 2004). This argument relies on the idea that temporary workers are "plug-in" disposable resources because of the limited investment in firm-specific human capital by both the employer and the workers. If temporary workers are immediately and perfectly replaceable, then externally churning temporary workers should be costless both on the exit and on the entry side.

Instead, we contend that there are also costs related to integrating new temporary workers. We expect the disruption that remaining workers experience after temporary workers' departure to increase with the proportion of new temporary workers who enter the unit. Extant research on the performance consequences of collective turnover has argued that the extent to which turnover disrupts performance depends on the capacity of the unit to absorb the disruption costs of integrating and socializing new workers (Hausknecht, Trevor, & Howard, 2009; Hausknecht & Trevor 2011). In their study of a large leisure and hospitality organization, Hausknecth et al. (2009) found that the negative relationship between voluntary turnover rate and customer service quality was more pronounced in those units that had a

higher proportion of newcomers, because those units had depleted resources with which to manage the disruption effects of turnover. Building on this argument, we argue that the costs of planned temporary worker turnover increase with the proportion of temporary workers who enter the unit as replacements.

Not only remaining workers have to change their work routines to accommodate the exits of their colleagues, they also have to divert part of their residual resources to the replacements. Newly hired temporary workers need some time to learn and to become as productive as the workers that they replace (Hale et al., 2016; Stratman, Roth, & Gilland, 2004). Transferring explicit knowledge about food preparation procedures, which are written and standardized, is relatively easy. It is much harder to teach tacit knowledge about when to fry an additional batch of fries, when to start baking additional bread, or how much mixing or chopping is "enough." Such knowledge needs to be acquired by vicarious learning and collaborative practice, and takes time and effort from the existing workers (Kacmar et al., 2006).

Thus, when temporary workers leave, remaining workers may find themselves devoting a great deal of time to train replacements on how things need to be done in the organization—at the expense of pace and efficacy in their own core tasks and, ultimately, the unit's performance (Hausknecht et al., 2009). Furthermore, because temporary workers are usually outside formal policies on integration, the task of integration is often left to the workers who work side by side with them (Broschak & Davis-Blake, 2006; Geary, 1992; Smith, 1994).

We expect the proportion of replacements to moderate the relationship between planned temporary worker turnover and performance. Specifically, when planned temporary worker turnover is below the optimal level—that is when the benefits of flexibility outweight the costs of turnover—the positive relationship between planned temporary worker turnover

and unit performance will be less positive when the proportion of replacements is high than when it is low. When planned temporary worker turnover is beyond the optimal level—that is when the costs of turnover outweight the benefits of flexibility—the negative relationship between planned temporary worker turnover and unit performance will be more negative when the proportion of replacements is high than when it is low.

Accordingly, we hypothesize:

Hypothesis 2. The planned turnover of temporary workers and the proportion of replacements among temporary workers interact in predicting unit performance: an additional unit of planned turnover decreases performance more when the proportion of replacements among temporary workers is high than when it is low.

Planned Temporary Worker Turnover and Replacements' Firm-specific Human Capital

The proponents of the capacity theory (Hausknecht & Holwerda, 2013) and of the Context-Emergent Turnover theory of collective turnover (Nyberg & Ployhart, 2013) have argued that the extent to which turnover disrupts the unit performance depends on the quality of replacements: better workers are more productive and learn faster, so they need less support from colleagues than those of lower quality. The entry of high-quality replacements thus mitigates the rate at which turnover disrupts performance (Call et al., 2015; Nyberg & Ployhart, 2013). In their capacity theory, Hausknecht and Holwerda (2013: 215) elaborate further on this point in the case of permanent workers, arguing that "newcomer proficiencies are necessarily constrained to general human capital, because firm-specific knowledge and firm-specific social capital cannot be acquired until newcomers actually enter an organization."

In the case of temporary workers, however, replacements are often recurrent temporary workers who have worked in the organization at some time in the past. Indeed, organizations that rely on temporary workers commonly have networks of on-call qualified

temporary workers who have worked for them, and use that pool to hire temporaries (Smith, 2001; Smith & Neuwirth, 2009).

Having worked for the company in the past is likely to increase replacements' skills to do the job and therefore to reduce disruption for remaining workers. Replacements with previous experience in the organization may have also developed interpersonal relationships with workers in the unit, which can be useful for a faster integration (Reilly et al., 2014). In addition, the average quality of the replacements should be higher for rehired workers than for novice ones, since unproductive workers are not likely to be rehired. In the absence of firm-specific knowledge and social ties, socializing and training inexperienced replacements will demand more from remaining workers (Hausknecht et al., 2009).

We thus expect the relationship between planned temporary worker turnover and performance to vary with the firm-specific experience of replacements. When replacements are new to the organization, training and supporting them requires a larger amount of the remaining workers' time and attention. Therefore, a given level of planned turnover should damage performance more when replacements are novices rather than experienced. We therefore propose:

> *Hypothesis 3. The planned turnover of temporary workers and the firm-specific experience of replacements interact in predicting unit performance: an additional unit of planned turnover decreases performance more when replacements are novices than when they are experienced.*

METHODS

Research Setting

The setting for this study is a multinational company, one of the world's leading chains in food and beverage services for travelers that agreed to provide annual personnel and performance data for its sales network in Italy. The unit of observation in our study is the store or point of sale.

A typical store employs, on average, 29 workers. Usually, a store workforce is composed of a manager who is responsible for managing the store and accountable for its performance, and a group of workers, referred to as the basic operators, who perform the activities necessary to sell food and beverages with good service. Workers' typical tasks include low-skill activities such as taking customer orders at the counter or table, preparing food and beverages (e.g., making sandwiches or preparing a cappuccino), serving as cashier, displaying goods, and store cleaning and maintenance. Store managers are in charge of managing operations and sales, staffing, training, and assigning jobs; they also oversee hygiene and goods display. Other decisions such as product offerings and marketing efforts are centralized in the headquarters of the organization and are therefore relatively homogeneous across stores.

The company has a general strategic guideline for using temporary workers to facilitate adaptation to demand, but the decisions about how and how much to use temporary workers are largely decentralized; store managers choose the number of temporary workers they want to hire, the duration of their contracts, and the tasks to which they are assigned. The duration of temporary contracts and the replacements vary across stores depending on several factors, mostly managers' preferences, but also store-specific demand seasonality, and the availability of the existing permanent workers.[1]

One of the managers describes this decision-making process as follows: "You can have different durations, it depends on the needs, 3 months seasonal workers who exit at the end of August, or cover a maternity leave. Different reasons and thus different durations."

Managers also decide how and when to replace these workers, selecting other temporary workers through three major channels: external temporary hires, rehires of

[1] In order to account for the variance in managers' style and abilities, we control for manager fixed effects in our analyses. Differences in managers, measured as manager fixed effects, explain 27.62% of the variance in the number of hours worked by temporary workers in the unit in one month, 14.06% of the variance in the turnover of temporary workers, and 29.07% of the variance in the proportion of replacements.

temporary workers who previously worked for the company,[2] and transfers of temporary workers from other units. In order to replace workers more readily, some managers keep lists of workers who worked in the store in the past and contact them directly when they need to replace a worker. Many interviewees reported having worked at a given store in a given season or period, then not having been renewed immediately, and then having been recalled (some said after fifteen days, others said after several months). Transfers usually occur because the manager's need for an additional worker matches either the worker's desire to transfer or the need to reduce staff in the unit from which the worker transfers.

Store managers initiate the hiring process. If they believe the store needs an additional worker, they forward a hiring request to the manager of the geographical area in which the store is located. In the request, they indicate the type (temporary or permanent) and the length of the contract. If the regional manager approves the request (as is usual, depending upon the budget constraints imposed by headquarters), the store manager searches for the worker and hires her.

It is important to note that this setting is particularly suitable to our study for two major reasons. First, interviews with managers and with permanent and temporary workers revealed that permanent and temporary workers work together in the same shifts and perform similar and interdependent tasks. Interviewees confirm that "everyone does a little bit of everything" and all the workers act as a "joker and go where needed." A permanent employee who works in one of the organization's pizza restaurants describes the workflow of his daily shift as follows: "(in the kitchen) someone makes the pizza and someone else cuts it, otherwise we can't keep up with the customers…at the moment it's three of us back there, a

[2] In many European countries, including Italy, there is a legal limit on the cumulative duration of fixed-term contracts, after which the employer cannot keep hiring that worker under a temporary contract (Guell & Petrongolo, 2007).

guy with a temporary contract that we like very much because we work really well together, we collaborate a lot, a girl with a permanent contract, and myself."

Second, in this setting temporary workers are used as a way to achieve numerical flexibility, and not for other purposes such as screening candidates for permanent positions. For example, if a worker takes a maternity or sick leave, a temporary worker will substitute for her during that period. Furthermore, because of the highly seasonal nature of the business, which peaks in the summer, staffing needs vary over the year. Temporary workers are also used as a way to discharge part of the workforce easily if a reduction is needed.

Achieving this flexibility through temporary workers is particularly relevant in our context because of the strict labor market regulations in Italy, the country for which we have data. Italy has a dual labor market, with high employment protection for permanent workers but not for temporary workers. Accordingly, in our setting the only sizeable source of workers' exits is the expiration of temporary contracts (5% of the total store workforce on average per month and 30% of the temporary store workforce on average per month), with voluntary and involuntary attrition for permanent and temporary workers being below 1% on average per month because of the rigidity of the national labor market and the high costs of dismissing permanent workers (with corresponding strong disincentives to hire them). Moreover, given their low-skill profile, permanent workers consider working for an industry-leading multinational company a "good" job that they are unwilling to leave.

Data

We use a matched unit-employee dataset with monthly personnel and performance records in the years 2007–2014 (96 months). Because we are interested in the performance consequences of the expiration of temporary contracts, we consider only basic operators, since managers are always permanent employees. Basic operators, both permanent and temporary, are employed directly by the firm. Our unit of analysis is the store-month-year.

We manually matched the data with: (a) regional-level data from the Italian National Institute of Statistics (ISTAT) containing important macroeconomic indicators such as the unemployment rate in the various regions where the stores are located; and (b) data from the Italian Association of Highways (AISCAT) containing information on the volume of traffic on Italian highways. The initial database includes 19,340 store-month-year observations, for 256 stores for which we have complete information on the unit, the workers, and the manager.

Measures

Dependent variable: unit performance. We proxy unit performance with store profitability, measured as the logarithm of store net controllable profit in month t (Store Net Controllable Profit_t = (Total Sales_t – Cost of Goods Sold_t – Labor Cost_t – Other Store Costs_t). The company considers net controllable profit the fraction of a store's profit under managerial control and a "measure of the store managers' abilities in terms of waste and labor cost." This measure "captures latent positive financial benefit of turnover (i.e., decrease in payroll cost), while other measures such as unit sales do not" (Call et al., 2015: 1215) and is therefore particularly suitable to assessing the benefits of numerical flexibility. It has been used by previous turnover research (Call et al., 2015; Ployhart, Weekley, & Ramsey, 2009). For confidentiality reasons, the actual profits were multiplied by a decimal constant (x/1000).

Independent variables. *Planned temporary worker turnover.* We measure the planned turnover of temporary workers as the number of temporary workers leaving the unit because of contract expiration in month (t-1) divided by the average number of temporary workers in the store in month (t-1). The average is computed as the average of the number of temporary workers at the beginning and at the end of month (t-1). On rare occasions, temporary workers were immediately (within the same month) rehired after their contract expired. Since these workers did not really leave the unit, we did not count them as turning over.

Replacements. We measure the proportion of replacements among temporary workers as the total number of temporary workers who enter the unit in month (t) divided by the average number of temporary workers in the store in month (t).

Experienced replacements. We measure experienced replacements among temporary workers with the ratio between the total number of temporary workers entering the unit through either rehiring or transfer from another unit in month (t) divided by the average number of temporary workers in the store in month (t).[3]

Novice replacements. We measure novice replacements among temporary workers with the ratio between the total number of first-time temporary hires entering the unit in month (t) divided by the average number of temporary workers in the store in month (t).

Controls. *Unemployment rate.* We control for the trimestral unemployment rate in month t-1 in the region where the store is located with data from the National Institute of Statistics to account for the effect of the local availability of labor (Nyberg, 2010; Trevor, 2001).

Store size. We control for store size with the total number of hours worked by temporary (*Hours worked by temporary workers*) and permanent workers (*Hours worked by permanent workers*) in the unit in month (t). This measure captures the number of employees in the store, taking into account their contracted hours (Siebert & Zubanov, 2009).

Tenure of permanent workers. We control for permanent workers' tenure in the company in years in month (t-1) to account for their firm-specific knowledge and for their motivation (Veiga, 1981).

Store complexity. The company classifies stores on a scale of 1 (little complexity) to 6 (strong complexity) depending on floor space in square meters, daily traffic, and variety of

[3] On average, rehires constitute 98% of the total experienced replacements.

products and services offered. We use this measure to control for different degrees of management complexity.

Analysis

Our data provide monthly observations for each store over a period of 8 years, which implies that the residuals for a given store may be correlated. Accordingly, we use store fixed effects models with standard errors clustered at the store level to test our hypotheses. We run store fixed effects models in order to hold constant time-invariant, unobserved characteristics of the store that could be driving both the expiration of temporary contracts and performance, thus leading to biased estimates. Results from the Breusch and Pagan Lagrange Multiplier (LM) test and the Hausman test (Hausman, 1978) confirm the appropriateness of the choice of fixed-effects models rather than OLS or random effects specifications. We also control for year fixed effects in order to take into account environmental trends, such as changes in customer demographics or economic cycles, and for month fixed effects to account for seasonality. Moreover, we control for manager fixed effects to account for unobserved managerial characteristics that could be driving both the profitability of the store and how managers use temporary workers as well as replacements.

When estimating our models, we need to make an assumption about the speed at which we believe planned turnover is reflected into store performance. Following previous research on turnover, we use a one-month lag between the independent and the dependent variables (Reilly et al., 2014), because we are interested in investigating replacements that happen after turnover. In order to more accurately understand the nonlinearity in the interactions between replacements and planned turnover, we use a spline approach (Haans, Pieters, & He, 2016). First, we derive the optimal level of planned turnover empirically when we test hypothesis 1 (details are provided in the Results section). Second, we split the variable planned temporary worker turnover at the optimal value (Haans, Pieters, & He, 2016). The knot at the optimal turnover level is theoretically meaningful and gives us sufficient statistical

power at both high and low levels of turnover because our results suggest that the optimal level of turnover is very close to the median. This split generates two variables for the planned temporary worker turnover: one taking the values of planned temporary worker turnover up to the optimal level (*Low planned temporary worker turnover*) and the other taking the values higher than the optimal turnover level (*High planned temporary worker turnover*). *High planned temporary worker turnover* equals planned temporary worker turnover for all observations with turnover higher than the optimal turnover level and zero for the others. *Low planned temporary worker turnover* equals planned temporary worker turnover for all observations with turnover less than or equal to the optimal turnover level and zero for the others. The sum of the two variables equals the variable *planned temporary worker turnover*. Finally, we test hypotheses 2 and 3 about the moderation effects of replacements, using the variables *high planned temporary worker turnover* and *low planned temporary worker turnover* in our regression models. This two-part spline allows us to identify the effect of an additional unit of turnover at high and low levels of planned temporary worker turnover (Haans et al., 2016; Smith, 1979), while providing a more flexible test of nonmonotonicity than the squared turnover specification would have permitted (Bidwell & Briscoe, 2009; Haans et al., 2016).

One potential concern is that our results may be driven by endogeneity. Specifically, in making staffing decisions, managers are likely to take into account the seasonal trends of sales for the month. If that is the case, then we may observe a relationship between expiration of contracts in a given month and performance in the following month, but only because an omitted variable—e.g., a seasonal drop in demand—is affecting both factors. We address this concern in three different ways. First, we control for month fixed effects and manager fixed effects. Controlling for time fixed effects should in part capture anticipated seasonal drops in

demand, while manager fixed effects should capture the effect of managers' abilities to adjust to demand seasonality and design temporary contracts accordingly.

Second, we take a closer look at the trends in monthly revenues and in the planned turnover of temporary workers. Figure 1 shows the monthly average of sales revenues and planned temporary worker turnover. While sales revenues peak in August, planned temporary worker turnover peaks in September. This trend is consistent across the eight years of observation (2007–2014).

Insert Figure 1 about here

The graphs suggest that the relationship between planned turnover and unit performance is more likely to be driven by a seasonal drop in demand in September. In order to address this concern, we exclude observations in September from our analyses. The final database used in the analyses therefore includes 13,280 store-month-year observations, for 255 stores.

Finally, we collected detailed data on the volume of traffic on Italian highways from the Italian Association of Highways (AISCAT). These data allow us to control for the volume of customers that might transit in a sub-sample of the stores with a high degree of temporal and geographical precision. After extensive conversations with members of this association and the organization under study, we chose to measure the *Volume of Demand* with the total number of vehicles that traversed the highway segment where the store is located in each trimester (the finest-grained temporal unit available; a highway segment is defined as the segment of the road between two consecutive tollbooths and is the finest-grained geographical unit at which traffic data are recorded). This is also the measure of demand most often used by the organization under study and by the Italian Department of Transportation. In order to reassure that our results are not only driven by market conditions, we test the relationship between planned temporary worker turnover and unit performance in the sub-sample of stores

located on roads potentially affected by highway traffic, controlling for the volume of vehicles that traverse the segment where these stores are located.

RESULTS

Descriptive Statistics

Table 1 provides means, standard deviations, and correlations for the main dependent and independent variables in the analyses, with store-month-year as the unit of analysis. The standard deviation of the planned turnover of temporary workers is 0.52, which shows that stores vary in how they use the expiration of contracts.

Insert Table 1 about here

Planned Turnover of Temporary Workers

Table 2 presents our fixed effects analyses of the relationship between the planned turnover of temporary workers and unit performance. All the models in Table 2 include month and year fixed effects, store fixed effects, and manager fixed effects.

Insert Table 2 about here

Model 1 in Table 2 is the baseline model including all the controls. Model 2 tests the linear relationship between planned turnover of temporary workers and unit performance. Planned temporary worker turnover is negatively and significantly related to unit performance (b = -0.05, $p < 0.01$). Model 3 includes both planned temporary worker turnover and the quadratic term of planned temporary worker turnover to test for Hypothesis 1—that the planned turnover of temporary workers has an inverted U-shaped relationship with unit performance. We find that the coefficient of planned temporary worker turnover is positive and statistically significant (b = 0.12, $p < 0.01$), and that the coefficient of the quadratic term is negative and statistically significant (b = -0.21, $p < 0.001$). These coefficients suggest the existence of a curvilinear relationship.

Optimal turnover level. In order to further test for the presence of the inverted U-shaped relationship suggested by these coefficients, we follow the guidelines by Haans, Pieters, and He (2016). First, we examine the optimal point. We find that planned temporary worker turnover has a positive relationship to store performance up to 29.57% (0.30). For values of planned turnover beyond that point, the relationship turns negative. The stationary point is well within the range of values of planned temporary worker turnover in the data (mean = 0.30; s.d. = 0.52). Second, we examine the slopes of the curve. Consistently with an inverted U-shaped relationship, we find that the slope of the curve below the optimal point is positive (0.12) and statistically significantly different from zero ($t = 2.67$; $p < 0.01$), and that the slope of the curve beyond the optimal points is negative (-7.26) and statistically significant ($t = -3.22$; $p < 0.001$).

Overall these tests provide support for Hypothesis 1.

Size of the effects. To gain additional insights into the shape of the curvilinear relationship between the planned turnover of temporary workers and performance, we analyze the marginal effects on unit performance of different levels of planned temporary worker turnover. Importantly, we express the size of the effects in the monetary units obtained by multiplying the actual performance by a decimal constant (x/1000).

We find that an increase in planned temporary worker turnover from a low level (0, minimum value) to the optimal level (0.30) will increase the value of the logarithm of store net controllable profit by 0.02 (4.01 – 3.99). The magnitude of this percentage change has practical significance. If a unit with average performance (79.78) experiences an increase in its planned temporary worker turnover from low to optimal level, then its performance will increase by 1.6 monetary units (transformed by a decimal constant), which equals 0.02 standard deviations of store net controllable profits (2% increase in profits).

However, when the planned turnover of temporary workers increases beyond the optimal level, from the optimal (0.30) to a high level (0.82, one standard deviation above the mean), the value of the logarithm of store net controllable profit falls by 0.06 (3.95 – 4.01). The practical size of this effect for a unit with average performance (79.78) is a loss of 4.79 monetary units (transformed by a decimal constant), which equals 0.07 standard deviations of the store net controllable profit (6% decrease in profits).

Controlling for the volume of demand: analyses on traffic. As mentioned before, one potential concern with analyzing the performance effects of the planned turnover of temporary workers is that seasonal trends in demand may affect both turnover and unit profitability. To provide additional evidence that our results are not driven by anticipated falls in demand, we collected detailed data on highways traffic, and we test our hypotheses for stores whose demand is affected by the volume of this traffic. These stores constitute 70.17% of our sample.[4] Models 4 and 5 in Table 2 show our fixed effects analyses of the relationship between planned temporary worker turnover and unit performance for this sub-sample of stores. All the models control for the *Volume of Demand* and include month and year fixed effects, store fixed effects, and manager fixed effects.

Overall, the models confirm the results of the analyses presented above. Model 4 shows that planned temporary worker turnover is negatively and significantly related to unit performance (b = -0.04, $p < 0.05$). In Model 5, we include the quadratic term of planned temporary worker turnover. We find that the coefficient of planned temporary worker turnover is positive and statistically significant (b = 0.11, $p < 0.05$), and that the coefficient of the quadratic term is negative and statistically significant (b = -0.18, $p < 0.01$). These

[4] In order to ensure the comparability of the sub-sample of stores affected by highways traffic with the total sample, we re-estimate models 2 and 3 in Table 2 for that sub-sample. The results (not shown) confirm those estimated for the total sample and are available upon request.

coefficients confirm the existence of a curvilinear relationship even after we control for the volume of traffic where the store is located.[5]

Proportion of Replacements in the Temporary Workforce

Two-part spline. We test Hypothesis 2—that an additional unit of planned temporary worker turnover decreases performance more when the proportion of replacements among temporary workers is high than when it is low—using a two-part spline model at the optimal value of planned turnover rate (29.57%) derived from the estimated curvilinear relationship. The two-part spline provides a less restrictive test of Hypothesis 2 than using an interaction between the squared temporary turnover term and the moderator because it allows the moderator to have different effects at different levels of planned temporary worker turnover (Bidwell & Briscoe, 2009; Haans et al., 2016). The analyses are shown in Table 3. All the models in Table 3 include month and year fixed effects, store fixed effects, and manager fixed effects.

Insert Table 3 about here

Model 1 in Table 3 tests the curvilinear relationship between planned temporary worker turnover and unit performance. We find that the coefficient of low planned temporary worker turnover is positive and statistically significant ($b = 0.10$, $p < 0.05$) and that the coefficient of high planned temporary worker turnover is negative and statistically significant ($b = -0.14$, $p < 0.001$). The two-part spline model thus confirms the results of Model 3 in

[5] The analyses presented above control for the level of demand in stores. Conversations with the store managers in the organization revealed that they not only consider the level of demand when making staffing decisions but also the variation of demand compared to the same period in the previous year and the volatility of demand within the same year. In order to gain further confidence in our results, we conducted two additional tests of the relationship between temporary worker turnover and unit performance in the subsample of stores whose demand is potentially affected by highways traffic. First, we re-estimated Model 3 in Table 2 controlling for the percentage change in the Volume of Demand between the trimester under examination and the same trimester in the previous year. Second, we calculated the within-year variability in the Volume of Demand as the ratio between the standard deviation and the average of the Volume of Demand in a given year for a given store. We re-estimated Model 3 in Table 2 controlling for this ratio. The results were robust to the introduction of these controls. Overall, these models allow us to control for the ability of the manager to predict demand fluctuations and to plan the workforce size accordingly. Results from these additional analyses are not shown but are available upon request.

Table 2: we find evidence of a positive slope between the variable planned temporary worker turnover and performance for low levels of turnover and of a negative slope for high levels of turnover. [6]

Model 2 in Table 3 includes the proportion of replacements among temporary workers. We find a positive and significant relationship of replacements to unit performance ($b = 0.04$, $p < 0.001$). This finding confirms the argument that human capital inflows replenish the stock of human capital resources in the unit and restore the unit productive capacity (Call et al., 2015; Nyberg & Ployhart, 2013; Reilly et al., 2014).

Model 3 in Table 3 introduces the interactions of replacements with high and low levels of planned turnover of temporary workers, separately. Contrary to Hypothesis 2, we find a positive and significant interaction between low planned temporary worker turnover and replacements ($b = 0.26$, $p < 0.01$). When planned temporary worker turnover is below the optimal level (29.57%), an additional unit of turnover is more beneficial when the proportion of replacement workers is high than when it is low. This result suggests that when the unit experiences low levels of turnover, the remaining workers have enough residual resources to both integrate replacements and to perform their usual tasks. Therefore, replacements do not exhacerbate the disruption due to planned turnover. Instead, they mitigate it.

However, when planned temporary worker turnover is above the optimal level (29.57%), we find partial support for Hypothesis 2: we find a negative and marginally significant interaction between replacements and high planned temporary worker turnover (*b*

[6] Model 1 in Table 3 provides evidence of the inverted U-shaped relationship between planned temporary worker turnover and unit performance including replacements. We also estimate an alternative specification to this model. In particular, we estimate a model that includes replacements and the linear and squared terms of planned temporary worker turnover. We find that the relationship between the linear term of planned temporary worker turnover and unit performance is positive and statistically significant ($b = 0.11$, $p < 0.05$), while the relationship between the squared term of planned temporary worker turnover term and unit performance is negative and statistically significant ($b = -0.21$, $p < 0.001$). The relationship between replacements and unit performance is positive and statistically significant ($b = 0.04$, $p < 0.001$). This model confirms the two-part spline estimation results presented in Model 1 in Table 3.

= -0.10, $p < 0.10$). When the remaining workers in the unit face high levels of planned temporary worker turnover, an additional unit of turnover decreases performance more when the proportion of replacements among temporary workers is high than when it is low. Hypothesis 2 is thus partially supported, albeit only for high levels of planned temporary worker turnover.

Overall, Model 3 in Table 3 suggests that the moderation effect of replacements varies with the level of planned turnover that the unit experiences. The interaction between planned temporary worker turnover and replacements is positive at low turnover levels and negative at high turnover levels.

Figure 2 graphically represents the interaction between planned temporary worker turnover and replacements.

Insert Figure 2 about here

Size of the effects. To investigate the magnitude of the interaction effect shown in Model 3 of Table 3, we look at the marginal effect of the planned turnover rate of temporary workers at both low (0, minimum value) and high (0.83, one standard deviation above the mean) values of the proportion of replacements. We express the size of the effects in the monetary units obtained by multiplying the actual performance by a decimal constant (x/1000).

When the proportion of replacements is high (0.83), an increase from low (0) to optimal turnover (0.30) increases the value of the logarithm of store net controllable profits by 0.06 (4.05 – 3.99). For a store with average profitability (79.78) and a high proportion of replacements, shifting from zero to optimal turnover increases performance by 4.79 monetary units (transformed by a decimal constant), which represents 0.07 standard deviations of store net controllable profit (6% increase in profits). However, when replacements are high (0.83) and turnover increases from the optimal (0.30) to a high level (0.82, one standard deviation

above the mean), the value of the logarithm of store net controllable profit falls by 0.10 (3.87-3.97). For a store with average profitability (79.78) and a high proportion of replacements, this decrease equals 7.98 monetary units (transformed by a decimal constant), that is 0.11 standard deviations of store net controllable profit (10% decrease in profits).

Replacements' Firm-specific Human Capital

Two-part spline. We test Hypothesis 3—that an additional unit of planned turnover decreases performance more when replacements are novices than when they are experienced—using a two-part spline model. The analyses are shown in Table 3. All the models in Table 3 include month and year fixed effects, store fixed effects, and manager fixed effects.

Model 4 in Table 3 includes experienced and novice replacements and shows a non-linear relationship between planned temporary worker turnover and unit performance even after controlling for different types of replacements. Model 5 in Table 3 includes the interactions of experienced and novice replacements with planned temporary worker turnover. We find a positive and statistically significant interaction between experienced replacements and low planned temporary worker turnover ($b = 0.20$, $p < 0.05$). We also find that the interaction between novice replacements and planned temporary worker turnover has a positive and statistically significant coefficient ($b = 1.27$, $p < 0.05$). These results suggest that, at least for low levels of planned turnover, once the unit has reaped the benefits of flexibility, replacements (both novice and experienced) contribute to restoring its productive capacity (Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013).

However, when planned turnover is above the optimal point (29.57%), we find that the interaction between planned temporary worker turnover and novice replacements is negative and statistically significant ($b = -0.56$, $p < 0.01$). In contrast, the interaction between high planned temporary worker turnover and experienced replacements is not statistically significant ($p > 0.10$). Model 5 thus suggests that when remaining workers experience high

levels of planned temporary worker turnover, the disruption of an additional unit of planned turnover increases with the proportion of novice replacements but not with the proportion of experienced replacements.

Figure 3 graphically represent the interaction between planned temporary worker turnover and replacements' firm-specific human capital.

Insert Figure 3 about here

Coefficient comparison. We use a Wald test (Engle, 1984) to compare the coefficients of the interactions of high planned temporary worker turnover with experienced and novice replacements in model 5. This test allows us to investigate whether the difference between the coefficients is statistically different from zero. The Wald test suggests that we can reject the hypothesis that the two coefficients are equal at the 5% confidence level ($F(1,254) = 5.43$; $p < 0.05$). The test confirms that an additional unit of planned temporary worker turnover decreases performance more when replacements are novices than when they are experienced. Overall, model 5 shows that the effect of the firm-specific human capital of replacement workers on the planned turnover-performance relationship varies with the level of planned temporary worker turnover: Hypothesis 3 is supported for levels of turnover beyond the optimal level (29.57%).

Size of the effects. To investigate the magnitude of the interaction effect shown in model 5 of Table 3, we look at the marginal effect of the planned turnover rate of temporary workers at both low (0, minimum value) and high (0.24, one standard deviation above the mean) values of novice replacements. When the level of novice replacements is high (0.24), an increase from low (0) to optimal turnover (0.30) increases the value of the logarithm of store net controllable profits by 0.11 (4.08 – 3.97). For a store with average profitability (79.78) and a high rate of novice replacements, shifting from zero to optimal turnover increases performance by 8.78 monetary units (transformed by a decimal constant), which

represents 0.12 standard deviations of store net controllable profit (11% increase in profits). But—again, when the proportion of novice replacement is high—an increase from optimal (0.30) to high turnover (0.82) decreases the value of the logarithm of store net controllable profits (transformed by a decimal constant) by 0.14 (3.83 – 3.97). For a store with average profitability (79.78) and a high proportion of novice replacements, this decrease equals 11.17 monetary units (transformed by a decimal constant), that is 0.16 standard deviations of store net controllable profit (14% decrease in profits).

Additional Evidence from Interviews

In order to evaluate the practical validity of the theoretical mechanisms we hypothesize, we interviewed key informants about the consequences of planned temporary worker turnover. We were given access to three units. We were allowed to interview three managers, three temporary workers, and three permanent workers, one each in the three different units. The units were selected in partnership with the organization and represent three of the most strategically relevant stores that the organization runs. All units regularly employ temporary and permanent workers and share the same business model with the other units in the sample. The interviews were conducted personally by one of the authors; all interviews were recorded. Each interview lasted about half an hour and followed the same protocol (the questions were tailored for each type of respondent: managers, temporary workers, or permanent workers).

Our interviews were structured to gather information about (1) the level of interaction between temporary and permanent workers on their daily shifts, (2) the disruption generated by temporary workers' exits from the unit, and (3) the disruption generated when new temporary workers joined the unit. In order to collect this information, we asked managers (a) how they developed the workforce planning for the unit (i.e., how they decided how many permanent and temporary workers to hire and when), (b) how they assigned temporary and permanent workers to jobs (i.e., how they organized each shift), (c) how they selected

temporary workers, and (d) whether they had faced problems with the interaction between permanent and temporary workers in the unit or with integrating replacements (both permanent and temporary) into the unit. We asked permanent workers about their level of interaction with temporary workers in the unit, the division of work between them and temporary workers, and the consequences they had experienced when a temporary worker left the unit. We also asked them how incoming temporary workers were socialized and integrated into the unit. Finally, we asked temporary workers what difficulties they had faced when joining the unit, how they were integrated into the unit, how much time it took them to become proficient, and how much they interacted with permanent workers.

All key informants reported that the level of interaction between permanent and temporary workers is high. Managers reported that they allocated temporary and permanent workers to jobs as needed, regardless of their contracts. As a result, permanent and temporary workers worked together in all the shifts. This reality was also reflected in the response of a worker who was hired as a temporary worker and then moved into a permanent position: "I did not notice any change in terms of the work I have to do…, I continue to do the same job as when I was a temp." Referring to the interaction among workers in a shift, a temporary worker noted, "We help each other if needed. If there is something that needs to be cleaned, waiters help me in doing that." And one permanent worker commented, "If I see that the cafeteria is a mess, I lend a hand." This same worker described the relationships in the unit as being "all friends, like a big family." Another temporary worker reported that "there is a lot of collaboration among us; we always try to lend a hand to each other regardless of the contract we have, especially in the mornings when there is a lot of work due to the breakfasts."

Consistently with this high level of interaction, our key informants suggested that there was disruption when temporary workers left the organization. Although managers and workers acknowledged that managers could plan the number of workers according to the unit

needs, they also reported that the exits of temporary workers forced them to re-adjust their work. For example, one of our interviewees reveals that "anytime a buddy, a colleague with a temporary contract, leaves, the others take on more work, work is redistributed." Another worker mentioned an instance when "he had to close one of the cash desks to go and help in the kitchen." A manager reported also that "workers need to adjust their rhythms when a temporary worker leaves." Referring to the amount of workload left in the unit when a temporary worker left, another manager commented that everybody remaining in the unit needed to "tighten their belts a little bit" even if that meant "doing more work in support activities such as loading and unloading materials from the truck or cleaning."

Respondents' answers also suggested disruption due to the arrival of replacement workers into the unit, because there are firm-specific skills that need to be acquired. First, temporary workers reported that when they first got to the unit, they needed to learn many skills and acquire knowledge about its processes. Referring to a new replacement, an experienced worker said that "during the weekend, poor thing, we overwhelmed her, do this, give me that, get me the water, pick the coffee for me," and that she herself had learned the same hard way: "This is how I learned where things are located and why they are where they are. After a week I had learned that if I was in the cafeteria, I needed to have the sugar, the napkins, so then I left everything prepared in front of me to have it ready." A manager described replacements as "being a little clumsier" at the cash desk for the first weeks. Although it took only a week or two to learn the ropes of the unit, all the respondents mentioned that there was a pretty steep learning curve; workers referred to their first weeks as "traumatic," "frightening," "tough."

Second, workers also mentioned that their coworkers had helped them a lot during their first days in the unit. Specifically, they referred to the practice of "shadowing an experienced worker in the unit" in order to learn how to do their jobs. Those who had had to

teach replacements highlighted that the arrival of replacements was disruptive for their work: "When a new temporary worker arrives it is more stressful also because you have to do your job but also keep an eye on the newcomer and explain to him where is this, where is that, where you get this, where you get that…after eight hours if you ask me what's my name I don't remember it." Another reported that when he was responsible for teaching someone, this "implied a lot of work for him."

Overall, our interviews validate our contention that temporary workers develop firm-specific human capital and that their planned turnover and consequent replacement disrupts the workflow of the remaining workers in the organization.

DISCUSSION

This research extends our understanding of the costs and benefits of numerical flexibility. Building on the collective turnover and on the contingent worker literatures, we develop new predictions of how planned temporary worker turnover affects unit performance. Where scholarly and managerial arguments suggest that temporary workers are disposable resources, we argue that this unique type of planned turnover impairs the unit productive capacity. Thus, planned temporary worker turnover poses a unique challenge to the organization: balancing the benefits of flexibility and the costs of planned turnover.

Using a sample of 13,280 store-month-year observations for 255 stores, we hypothesize and find that (a) the planned turnover of temporary workers has an inverted U-shaped relationship with unit performance; (b) the negative performance effects of planned temporary worker turnover increase with the proportion of replacements among temporary workers; and c) the marginal cost of planned temporary worker turnover is higher when replacements are novices than when they have already worked in the organization in the past.

Theoretical Implications

Our paper reconciles the contradictory predictions of the collective turnover literature—that turnover of any type impairs organizational performance—and of the

contingent work literature—that the departure of temporary workers, being forecastable and functional in that it enables flexibility, should have positive performance consequences. We propose that planned temporary worker turnover has an inverted U-shaped relationship with unit performance because of the combination between the benefits of numerical flexibility (Cappelli & Neumark, 2004; Osterman, 1987, 1988) and the costs of operational disruption (Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013). Our findings confirm this argument. We find evidence that low levels of planned temporary worker turnover improve unit performance up to an optimal level of turnover. However, when planned temporary worker turnover goes beyond this optimal level, it impairs unit performance.

This finding improves our understanding of the consequences of turnover when exits and replacements are planned in advance (Price, 1977) for strategic purposes (Nyberg & Ployhart, 2013). While the literature on collective turnover would suggest that the costs of temporary workers' departures due to the expiration of their contracts are negligible because exits are planned and strategic (Hausknecht & Holwerda, 2013; Nyberg & Ployhart, 2013), we find that high levels of planned temporary worker turnover can significantly hinder unit performance because of the disruption in the operational capacity of the unit that they generate.

An alternative explanation for the finding of a negative effect of planned temporary worker turnover on unit performance could be that unit performance drops when temporary workers' departures peak because of a demand fall. We try to rule out this alternative explanation in our analyses in several ways: we exclude September (the month right after the peak of demand due to seasonality) from our observations, we control for manager, month, and year fixed-effects, and we conduct a set of sub-sample analyses where we control for the volume of demand (captured as the volume of highways traffic). We complement these analyses with interviews to managers and workers: the interviewees revealed that planned

temporary worker turnover disrupts the workflow in the unit. Overall, both our quantitative and qualitative evidence provide confidence that our results are driven by the depletion of the human capital resources in the unit (Nyberg & Ployhart, 2013) rather than by fluctuations in demand.

A further contribution of this study is to analyze the flexibility benefits of planned turnover. In so doing, we develop original theoretical predictions on how these benefits combine with the costs of workers' exits. While the literature has mentioned that in certain cases turnover may be beneficial for the organization (Glebbeek & Bax, 2004; Shaw, Gupta & Delery, 2005; see Shaw [2011] for a review of these studies), the common explanations are unlikely to apply to the case of planned temporary worker turnover. The majority of these studies argue that voluntary turnover has a revitalizing effect on performance (Shaw et al., 2005), that is, that low levels of turnover benefit the unit by improving "workforce innovation, flexibility, and adaptability (Abelson & Baysinger, 1984; Dalton & Todor, 1979)" (Shaw, 2011: 202). Alternatively, Siebert and Zubanov (2009) propose a "discharge-rate" argument: when the organization does not invest in the selection of workers, then it needs some turnover to fire those poor performers who ex-post exhibit a lack of fit. However, the revitalization and the discharge rate arguments are insufficient to explain our finding that the relationship between planned temporary worker turnover and performance is curvilinear. For instance, when the temporary contracts of servers in a restaurant expire, the remaining workers are more likely to be overworked than revitalized in performing their relatively standardized tasks (particularly so if demand does not fall). Similarly, since the expiration dates of temporary contracts are set ex-ante, temporary workers leave the restaurant irrespectively of their actual performance and fit. The benefits of firing bad matches who were not carefully selected are distinct from those of the carefully planned expiration of contracts.

To our knowledge, this study is one of the first attempts to develop and test a theoretical model of the unique benefits and costs of externally churning workers for flexibility purposes.

We also analyze how the proportion and the firm-specific human capital of temporary workers who come to replace the ones that left, moderate the relationship between planned temporary worker turnover and performance. We predict that the marginal cost of temporary workers' planned departures increases with replacements because remaining workers have to devote time and resources to integrate the newcomers. We only find partial support for this hypothesis. Contrary to our prediction, we find that for low levels of planned temporary worker turnover, replacements positively moderate the positive relationship between planned temporary worker turnover and performance. This finding suggests that the quantity of replacements mitigates the costs of planned turnover because new workers restore the unit's productive capacity, which is also consistent with the prediction by the Context-Emergent Turnover theory (Call et al., 2015; Nyberg & Ployhart, 2013). However, for high levels of planned turnover, we find marginal support for our hypothesis that replacements exacerbate the disruptive effects of turnover because they increase the workload of remaining workers (Hausknecht & Trevor, 2011). Our findings provide original insights by showing that replacements can have positive but also negative effects on the planned turnover-performance relationship depending on the level of disruption that remaining workers experienced.

We also contribute to the Context-Emergent Turnover (CET) theory on the interaction between the quality of replacements and turnover (Call et al., 2015; Nyberg & Ployhart, 2013) by comparing the consequences of bringing replacements with firm-specific experience to those of bringing novices. For high levels of planned turnover, we find evidence consistent with our argument that the marginal cost of turnover is higher when replacements are novices than when they are experienced because newcomer's firm-specific skills mitigate the negative moderation effect of replacements. This finding also extends the prediction of the Capacity

Theory of collective turnover (Hausknecht & Holwerda, 2013)—that newcomer's general human capital mitigates the negative performance effects of turnover—by providing an empirical and theoretical account of the moderation effect of replacements' firm-specific skills. While existing research assumes that replacements only have general skills (Hausknecht & Holwerda, 2013), this study builds our understanding on the consequences of using replacements who worked for the organization in the past. While more research is needed to fully understand the effects of this type of replacements, our findings constitute a starting point to bridge the literatures on the performance consequences of turnover and replacements (Call et al., 2015; Reilly et al., 2014) and on returning employees (Shipp, Furst-Holloway, Harris, & Rosen, 2014).

Finally, by analyzing the cost of contingent workers' departures due to the expiration of their contracts, our study also contributes to the literature that has documented the negative consequences of using contingent workers (Broschak & Davis-Blake, 2006; Davis-Blake et al., 2003; Fisher & Connelly, 2017; George et al., 2012; Kesavan et al., 2014; Smith, 2001). This literature has found that the presence of temporary workers can disrupt unit operations, increase conflict, and worsen the attitudes and behaviors of permanent workers. Our study reveals an additional cost, at least for moderate to high levels of departures: the performance losses caused by temporary workers' exits. While it may be true that such scheduled exits avoid the costs of breaching contracts (Matusik & Hill, 1998), they do have other costs.

Managerial Implications

Managerial implications can also be derived from our study. First, managers hiring temporary workers should consider the cost of losing them. They should carefully examine alternative combinations of employment relations and properly estimate the total cost associated with holding a diversified portfolio of contractual arrangements. Line managers and human resource departments, especially, should thoroughly assess the performance implications of temporary worker turnover (see also Fisher & Connelly, 2017)—the costs as

well as the benefits. Our results show a *hidden cost* of using temporary workers to achieve flexibility: temporary workers develop firm-specific human capital that is lost and needs to be replaced when new temporary workers come to the unit. Thus, the assumption that temporary workers are easily disposable is not necessarily true. This finding is particularly relevant in light of the growing prevalence of temps in many labor markets (for recent data see for example OECD Statistics 2017[7]).

Second, organizations should help managers and remaining employees to counter disruptions. Our findings suggest that managers can strategically replace temporary workers in order to minimize the negative effects of their departure on performance, and more generally, the negative consequences of using them (for related findings see also Broschak & Davis-Blake, 2006; Lautsch, 2002). In particular, managers should avoid overstaffing their units with novice replacements after waves of high planned temporary worker turnover, since this may increase disruption costs. In other words, churning (firing and hiring) high amounts of temporary workers may have negative performance implications for the unit performance.

The practical significance of our results may seem minor because of the relatively small magnitude of the effect of planned temporary worker turnover on unit performance. However, this effect may be important in our research setting. Interviews with the company's top managers revealed their beliefs that the main factors driving sales in the stores were location and seasonality, and that there was little room for managers and workers to make a difference in performance. They were surprised to hear that the staffing of temporary workers could make such a difference.

Limitations and Future Research

The specific characteristics of our research setting limit the generalizability of our findings. First, we use data from only one company in only one country, Italy, which is

[7] https://data.oecd.org/emp/temporary-employment.htm, retrieved on July 18, 2018.

characterized by high employment protection for permanent workers. Our context was ideal to identify the effects of temporary workers' planned departures because the labor market regulation made other types of turnover almost negligible. However, this also limited our ability to study how this type of turnover interacted with other types of turnover that could be happening simultaneously. In contexts where there is less protection for permanent workers and a more flexible labor market, the company may be able to use other strategies (such as dismissing and replacing permanent workers or incentivizing voluntary exits) instead of focusing only on temporary workers. Future research should examine contexts in which other types of turnover are more common.

Second, the company analyzed gives unit managers little autonomy in managing the job security of permanent workers, their compensation, or their incentives (Tsui, Pearce, Porter, & Hite, 1995; Tsui, Pearce, Porter, & Tripoli, 1997). These human resource practices, which help shape how permanent workers behave, are defined at the corporate level. We therefore could not investigate how other discretionary, unit-level human resource practices might moderate the effects of planned temporary worker turnover on unit performance. These practices might determine the reactions of permanent workers to both exits and replacements in the unit (Batt & Colvin, 2011; Hausknecht et al., 2009), and should be investigated in future research. For example, permanent workers may react differently to planned temporary worker turnover and replacement depending on the climate in the unit (Nyberg & Ployhart, 2013). Future research should also consider the effect of managers and their discretion on how temporary and permanent workers interact and how turnover affects organizational performance (Smith, 1997).

Third, the jobs performed by the basic operators at this company are all low skilled. In situations where jobs require more training, the departure of temporary workers could disrupt operations even more. Thus, our results provide a conservative test of the effects of planned

turnover on performance (Shaw et al., 2005). Hiring and training new, short-term employees for jobs requiring more skills might be costlier than having permanent workers temporarily cover some jobs when temporary workers leave. Future studies could investigate whether our results generalize to other contexts in which there is more complex knowledge work. This line of inquiry is particularly relevant given that today contingent workers can be engineers, IT professionals, software developers and programmers, and even managers (Bidwell, 2009).

Furthermore, in this research setting, temporary and permanent workers perform the same type of jobs. The quality of temporary workers is considered as good as that of permanent workers and they are paid similar salaries. Our findings may be different in settings where the quality of temporary workers is considerably lower than that of permanent ones and where temporary workers are paid less than others. For instance, in those settings, we could expect the negative effects of novice replacements to be more severe because, when their quality is poor, replacements will take longer to learn.

Apart from the boundary conditions that limit its generalizability, our study also has some empirical limitations. Our data were archival; we do not have direct measures either of operational disruption or of remaining workers' reactions to being overworked or having to train replacements. Since we suggest that these are the main drivers of the negative effects of planned turnover on performance, we also have to acknowledge that we cannot directly test the mechanisms of the performance effects we observe. Our interviews with key informants from the setting provided some validation for our proposed mechanisms. Getting access to data about operations disruption and remaining workers' reactions would require a longitudinal survey with data for each turnover event in every unit.

Finally, our study is not experimental, so we cannot completely rule out the possibility that our findings suffer from omitted variable bias. We tried to address endogeneity by controlling for demand (measured with traffic data) and limiting our analyses to months in

which falls in demand are harder to forecast. Furthermore, our data allowed us to control for seasonality effects and for manager fixed effects, therefore implicitly controlling for unobserved managerial ability to predict demand fluctuations and set temporary contract expiration dates accordingly.

CONCLUSION

Organizations today often rely on temporary workers to attain flexibility. The benefits of this flexibility stem from the opportunity to plan the turnover of those workers—that is, managers set the expiration of temporary contracts ex-ante to be able to adjust the workforce size to potential variations in market conditions. The extensive use of temporary workers relies on the assumption that they can be dismissed and replaced at a negligible cost according to the organizational needs. The current study challenges this assumption by testing the relationship between unit performance and the exits of temporary workers due to the expiration of their contracts. By testing this relationship with longitudinal monthly data from one organization in the food and beverage industry, we show that planned temporary worker turnover enables the unit to reduce labor costs but also disrupts the unit productive capacity. We also show how the negative consequences of this type of planned turnover can be mitigated or exacerbated by the quantity and the firm-specific human capital of replacements. By exploring the effects of planned turnover when exits and replacements are decided by managers and expected by remaining workers, we aim to advance our theoretical and practical understanding of planned turnover as a strategic tool.

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TABLE 1
Descriptive Statistics and Correlations [a, b, c]

	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Unit performance	79.78	71.71	1												
2.	Unemployment rate	.08	.04	-.25***	1											
3.	Hours worked by temporary workers	283.55	576.14	.44***	-.12***	1										
4.	Hours worked by permanent workers	1964.38	2025.81	.70***	-.11***	.29***	1									
5.	Tenure of permanent workers	10.29	3.81	.01	.29***	-.01	.07***	1								
6.	Store complexity	3.76	1.26	.45***	-.003	.15***	.43***	.05***	1							
7.	Planned temporary worker turnover	.30	.52	-.08***	.25***	-.03*	-.04***	.13***	.04***	1						
8.	Low planned temporary worker turnover	.12	.14	.06***	.12***	.12***	.05***	.08***	.09***	.66***	1					
9.	High planned temporary worker turnover	.17	.44	-.11***	.26***	-.06***	-.06***	.13***	.01	.98***	.48***	1				
10.	Novice replacements	.04	.20	-.04***	.024*	-.03**	-.05***	.01	-.04***	.15***	.02	.17***	1			
11.	Experienced replacements	.23	.42	-.02	.22***	.01	-.02	.10***	.04***	.25***	.18***	.24***	.15***	1		
12.	Replacements	.34	.49	.02*	.17***	.04***	-.01	.0646***	.06***	.40***	.28***	.38***	.41***	.88***	1	
13.	Volume of demand	152472.6	87226.87	.26***	-.18***	.15***	.17***	-.04***	.11***	-.01	.05***	-.024*	-.01	.02	.03**	1

[a] *$p < 0.05$
**$p < 0.01$
***$p < 0.001$
[b] Unit of analysis is the store-month-year.
[c] n = 13,280

TABLE 2
Fixed Effects Estimation: Unit Performance in Month t [a, b]

Variables	Model 1 Unit Performance $_t$ (n = 255)	Model 2 Unit Performance $_t$ (n = 255)	Model 3 Unit Performance $_t$ (n = 255)	Model 4 Unit Performance $_t$ (n = 167)	Model 5 Unit Performance $_t$ (n = 167)
Unemployment rate $_{t-1}$	-5.58***	-5.56***	-5.53***	-4.82***	-4.81***
	(1.09)	(1.09)	(1.09)	(1.02)	(1.01)
Tenure of permanent workers $_{t-1}$	-0.03**	-0.03**	-0.03**	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Store complexity $_{t-1}$	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Hours worked by temporary workers $_t$	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hours worked by permanent workers $_t$	0.00**	0.00**	0.00**	0.00$^+$	0.00$^+$
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Planned temporary worker turnover $_{t-1}$		-0.05**	0.12**	-0.04*	0.11*
		(0.02)	(0.05)	(0.02)	(0.04)
Planned temporary worker turnover squared $_{t-1}$			-0.21***		-0.18**
			(0.06)		(0.05)
Volume of demand				0.00***	0.00***
				(0.00)	(0.00)
Constant	4.39***	4.41***	4.40***	4.46***	4.45***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	13,280	13,280	13,280	9,041	9,041
R-squared	0.442	0.442	0.443	0.62	0.63
Store FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Manager FE	Yes	Yes	Yes	Yes	Yes

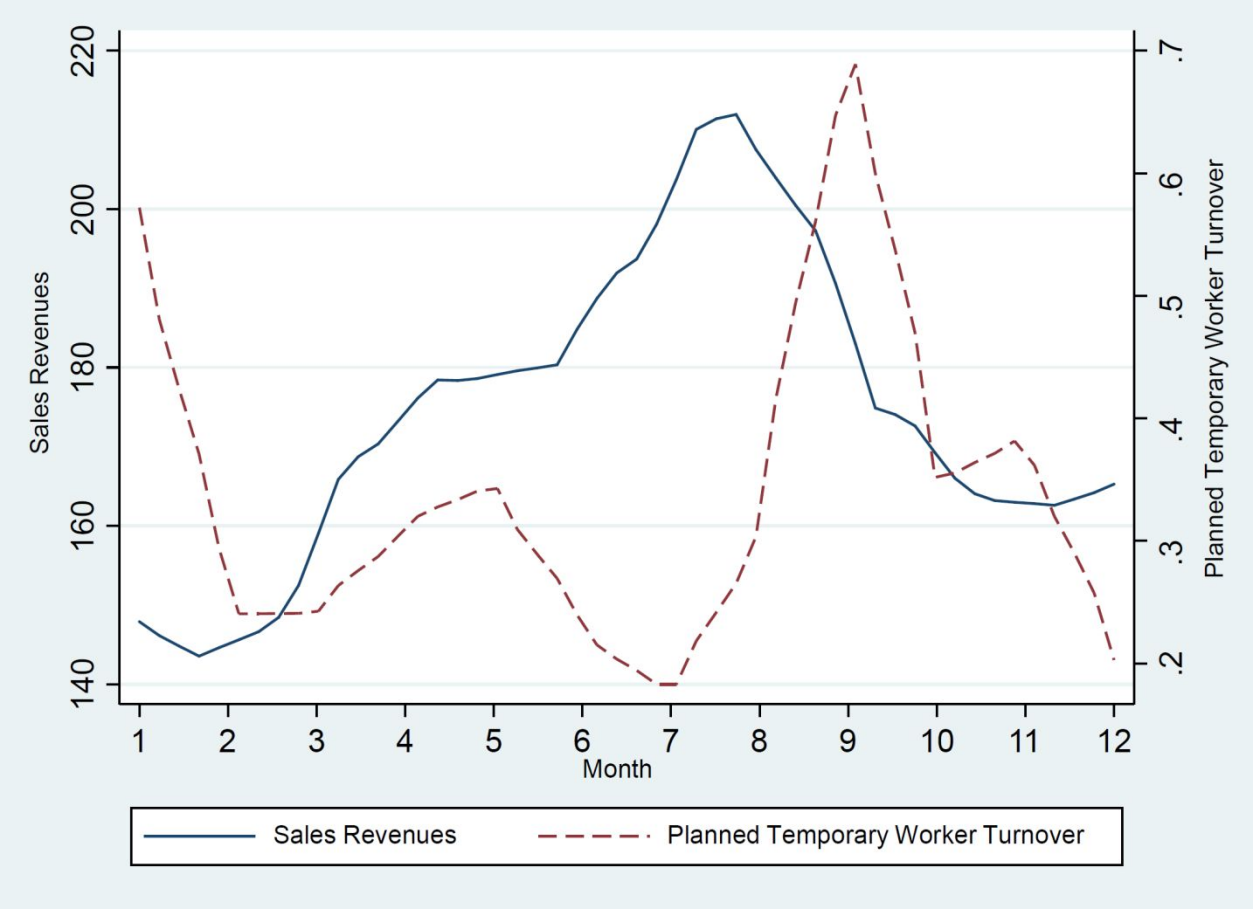
[a] $^+ p < 0.10$
$^* p < 0.05$
$^{**} p < 0.01$
$^{***} p < 0.001$
[b] Standard errors are in parentheses and are clustered by store.

TABLE 3
Fixed Effects Estimation: Interaction Effects [a, b]

Variables	Model 1 Unit Performance $_t$	Model 2 Unit Performance $_t$	Model 3 Unit Performance $_t$	Model 4 Unit Performance $_t$	Model 5 Unit Performance $_t$
Unemployment rate $_{t-1}$	-5.53***	-5.62***	-5.58***	-5.50***	-5.48***
	(1.09)	(1.08)	(1.09)	(1.09)	(1.10)
Tenure of permanent workers $_{t-1}$	-0.03**	-0.03**	-0.03**	-0.03**	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Store complexity $_{t-1}$	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Hours worked by temporary workers $_t$	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hours worked by permanent workers $_t$	0.00**	0.00**	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Low planned temporary worker turnover $_{t-1}$	0.10*	0.09*	-0.00	0.10*	0.02
	(0.04)	(0.04)	(0.06)	(0.04)	(0.05)
High planned temporary worker turnover $_{t-1}$	-0.14***	-0.16***	-0.12**	-0.15***	-0.12**
	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)
Replacements $_t$		0.04***	0.02		
		(0.01)	(0.01)		
Low planned temporary worker turnover $_{t-1}$ X Replacements $_t$			0.26**		
			(0.08)		
High planned temporary worker turnover $_{t-1}$ X Replacements $_t$			-0.10$^+$		
			(0.05)		
Experienced replacements $_t$				0.00	-0.01
				(0.01)	(0.01)
Low planned temporary worker turnover $_{t-1}$ X Experienced replacements $_t$					0.20*
					(0.09)
High planned temporary worker turnover $_{t-1}$ X Experienced replacements $_t$					-0.06
					(0.06)
Novice replacements $_t$				0.03*	0.02
				(0.02)	(0.02)
Low planned temporary worker turnover $_{t-1}$ X Novice replacements $_t$					1.27*
					(0.50)
High planned temporary worker turnover $_{t-1}$ X Novice replacements $_t$					-0.56**
					(0.20)
Constant	4.40***	4.40***	4.41***	4.41***	4.42***
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Observations	13,280	13,187	13,187	13,187	13,187
R-squared	0.44	0.44	0.44	0.44	0.44
Store FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Manager FE	Yes	Yes	Yes	Yes	Yes

[a] $^+ p < 0.10$
$^* p < 0.05$
$^{**} p < 0.01$
$^{***} p < 0.001$
[b] Standard errors are in parentheses and are clustered by store (n = 255).

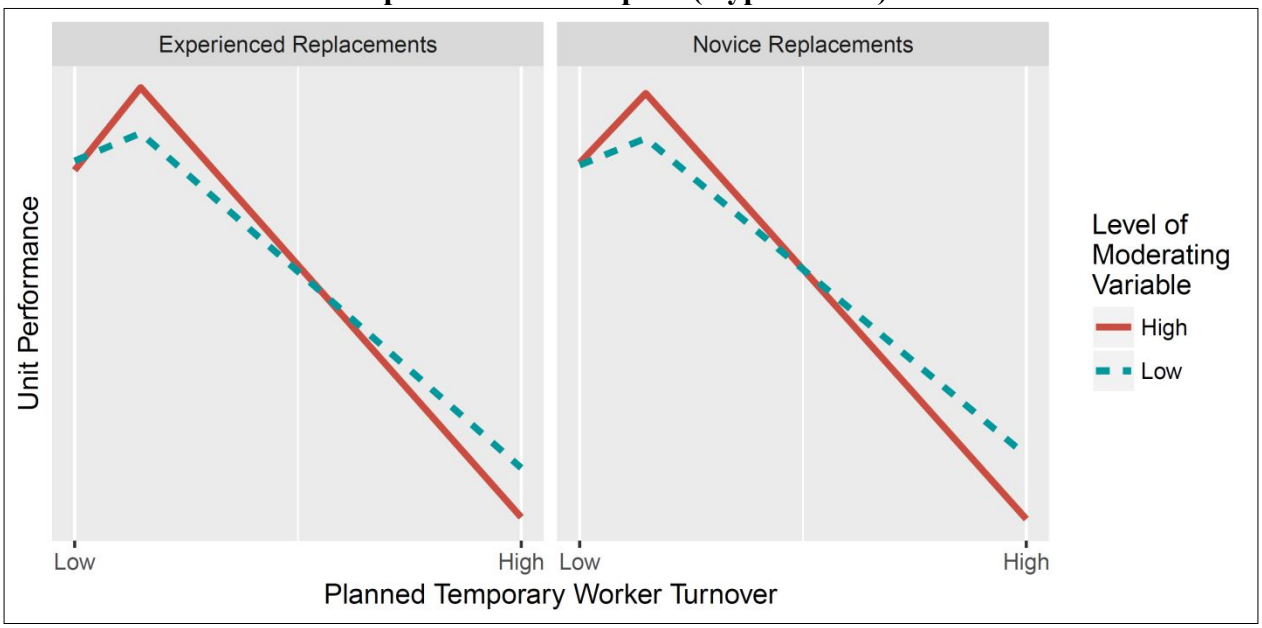
FIGURE 1
Planned Turnover of Temporary Workers and Sales Revenues (in Euros) over Time (Monthly Average)



Note: Sales revenues are multiplied by a decimal constant (the same used for the transformation of unit performance) for confidentiality reasons.

FIGURE 2
Moderating Effects of Planned Temporary Worker Turnover and Replacements (Hypothesis 2)

FIGURE 3
Moderating Effects of Planned Temporary Worker Turnover and Replacements' Firm-Specific Human capital (Hypothesis 3)



Federica De Stefano (fede@wharton.upenn.edu) is a postdoctoral fellow in the Wharton People Analytics Initiative at the Wharton School of the University of Pennsylvania. She received her PhD in business administration and management from Bocconi University. Her research focuses on strategic human capital, encompassing such topics as employee mobility, contingent work, and managerial human capital.

Rocio Bonet (rocio.bonet@ie.edu) is an associate professor in the Human Resources and Organizational Behavior Department at IE Business School, IE University. She received her PhD in management from the University of Pennsylvania. Her research focuses on flexible work practices in organizations, inter-organizational careers, and incentive pay.

Arnaldo Camuffo (arnaldo.camuffo@unibocconi.it) is Professor of Business Organization at Bocconi University. His research has appeared in Management Science, Organization Science, Strategic Management Journal, Research Policy, Industrial and Corporate Change and MIT Sloan Management Review.