

This item is the archived peer-reviewed author-version of:

Improving dynamics or destroying human capital? The nexus between excess turnover and performance

Reference:

Wynen Jan, Kleizen Bjorn.- Improving dynamics or destroying human capital? The nexus betw een excess turnover and performance Review of Managerial Science - ISSN 1863-6683 - 11(2017), p. 1-23 Full text (Publisher's DOI): https://doi.org/10.1007/S11846-017-0249-9 To cite this reference: http://hdl.handle.net/10067/1449530151162165141

uantwerpen.be

Institutional repository IRUA

Short title: Turnover & Performance; testing alternative views

Improving dynamics or destroying human capital? The nexus between excess turnover and performance

Evidence from the U.S. Federal Government

Keywords; Turnover, Public Sector, Labour market mobility, Organisational performance

Abstract

The flow of employees leaving the organization and the necessity of finding and training suitable replacements is an important issue in the day-to-day management of organizations. However, the body of research empirically examining the exact effects of such employee flows on the performance of organizations remains relatively underdeveloped. This article aims to increase our understanding of this topic by unraveling the link between excess employee turnover – a concept incorporating both the entry and exit of employees – and the performance of US public sector organizations. The results indicate that a linear negative relationship between excess employee turnover and performance surfaces in a time-lagged manner. This finding first of all suggests that human resource management should continue to devote attention to turnover and employee retention, and secondly implies that researchers should specifically take into account potential medium to long-term effects when studying excess turnover.

Keywords: excess employee turnover, performance, turnover

1 Introduction

Heightened levels of employee turnover are often believed to be strongly dysfunctional to an organization. Based on this assumption, an increasing number of studies examine the factors that explain changes in turnover rates, in a bid to prevent or avoid the occurrence of such effects (e.g. Mitchell et al. 2001; Pitts, Marvel and Fernandez 2011; Choi, 2009; Jung 2010; Lee and Whitford 2008; Wynen and Op de Beeck 2014; Rubin 2009; Hancock et al., 2013; Liu & Lin, 2017). However, our insight into the question whether – and if so, how – turnover rates within organizations are linked to performance remains limited (Park & Shaw, 2013). Such an understanding is essential to assess the necessity of measures to reduce or prevent turnover (Hancock et al., 2013). In an endeavor to increase our understanding of this relationship, our contribution will therefore examine the relationship between excess turnover – a variation on the turnover concept which broadens the paradigm to encompass both the flow of outgoing employees and their newly hired replacements – and the performance of US public sector organizations.

Where turnover generally refers to the proportion of an organization's workforce that leaves during a year, excess turnover goes one step further by not only considering employees leaving the organization, but also those entering the organization.ⁱ More specifically, excess employee turnover – sometimes also dubbed the churning rate – focuses on the replacement of "lost" employees (Burgess, Lane & Stevens, 2000; Centeno & Novo, 2012). The concept thus recognizes the simultaneous existence of two employee flows – one of new employees entering the organization and another of employees leaving the organization. Moreover, it corrects these flows for the net changes in employees, measured by the difference between hires and exits.

Studies on private organizations have already developed different theoretical models on the relationship between employee turnover and performance (Shaw, Gupta & Delery, 2005; Glebbeek & Bax, 2004; Grinza, 2014). The first of these models supports the traditional perspective that employee turnover negatively affects performance (e.g. Brown and Medoff 1978; Osterman 1987; Pencavel 1972). A second, alternative view posits that the negative effects of employee turnover on performance are attenuated as the rate increases (Price 1977; Shaw, Gupta & Delery, 2005; Watrous, Huffman & Pritchard, 2006). Finally, a third perspective argues that at least some degree of employee turnover is beneficial to organizational performance, as it allows the organization to retain a degree of adaptability and flexibility (Dalton and Todor 1979; Abelson and Baysinger 1984; Glebbeek & Bax, 2004).

Despite this progress, several issues remain unresolved within the literature. First, most studies have focused on the impact of traditional turnover rates on performance. This may cause distortions in the results, as traditional turnover rates may be inflated with other factors influencing performance, such as organizational restructurings and downsizings. Thus, by utilizing the excess turnover concept, through which we account for the net changes in employees, this paper adds novel and more robust insights on the validity of the linear, negative attenuated and curvilinear predictions made by turnover scholars (Grinza, 2014). The concept provides a particularly useful tool for the study of public organizations, as these have recently been confronted by a wide range of austerity measures (Peters, 2012). One such measure forces public sector organizations to impose a hiring stop whereby even lost employees (employees who have left the organization) could not automatically be replaced (Peters, 2012). Hence public sector organizations have been forced to shrink in size. The concept of excess turnover allows to filter out these imposed austerity measures leading to precisely capture the effect of turnover (the need to replace employees which have left the organization) on performance.

Second, as most research on the impact of hiring and replacement policies on performance has focused on the private sector, relatively little is known on the desirability of certain rates of replacement for public sector organizations. Meier & Hicklin (2007) investigate the relationship between turnover and performance within the context of Texan school districts, and Reilly et al. (2014) do so for a university hospital setting, but core administration agencies have remained uninvestigated. This is despite the sector's recent ambitions to move away from the traditional lifelong employer model, and to reduce the rigidity and perceived cumbersomeness of public organizations. This *inter alia* means that public organizations around the globe are making increasing use of temporary employment contracts, outsourcing and other HRM practices similar to private organizations (Boyne, Jenkins & Poole, 1999; Selden & Moynihan, 2000; Decramer, Smolders & Vanderstraeten, 2012). In this context, examining whether and how employee turnover is related to performance within public organizations does not only extend our knowledge to an under-investigated but sizeable sector, it is also of great use to HRM officers within such organizations.

Third, while research into turnover is highly sensitive to endogeneity resulting from spurious variables influencing both turnover and performance, many analyses up until have not accounted for this issue. We therefore utilize System-GMM analysis, which provides endogeneity-robust evidence for the alternative hypotheses proposed by turnover scholars (Grinza, 2014). Fourth, while earlier contributions have noted – mostly as a methodological point – that the inclusion of timelags is necessary (e.g. Glebbeek & Bax, 2004), the reason for the occurrence of these delayed effects remains under-investigated and undertheorized. Both the theoretical and empirical sections of the paper will therefore devote specific attention to the role played by timelags in the study of (excess) turnover.

Our results provide support for hypothesis that excess turnover detrimentally affects performance, with higher levels of excess turnover resulting in greater negative effects than relatively low levels. No evidence is found supporting the alternative hypotheses arguing that the relationship becomes attenuated for high levels of excess turnover, or that some level of excess turnover is beneficial to organizational performance. Interesting is, furthermore, that the effects seem to manifest themselves in a delayed manner, with time-lags of a year producing significant results. The remainder of this paper is organized as follows: Section 2 describes the existing theoretical perspectives into the effects of turnover and excess turnover, while the research design is discussed in section 3. The data and descriptive statistics are presented in section 4. The main findings are discussed in section 5, which is followed by some concluding remarks.

2 Theoretical Background and Hypotheses

Management studies on turnover have yielded a variety of – sometimes conflicting – theoretical insights into the relationship between rates of turnover and the performance of organizations (Shaw et al., 2005; Shaw, Gupta & Delery, 2005; Park & Shaw, 2013; Hancock et al., 2013). This study will test the validity of three of the more dominant perspectives on the way in which turnover and organizational performance interact. The first perspective draws on insights from human capital theory and expects a linear negative relationship between excess employee turnover and performance. The second perspective builds on sociological literature and learning curve theory and supports a negative attenuated relationship (Price, 1977; Shaw, Gupta & Delery, 2005). Finally, the third perspective departs from the purely cost-based assessments of turnover – and argues that the replacement of employees might have a positive effect on performance under some circumstances (Glabbeek & Bax, 2004; Grinza, 2014). Based upon this perspective the relationship between excess employee turnover and performance under some circumstances employee turnover and performance under some circumstances employee turnover and performance under some circumstances (Glabbeek & Bax, 2004; Grinza, 2014).

Park & Shaw (2013) and Hancock et al. (2013) provide useful meta-analyses that inter alia discuss these perspectives, and interestingly note that the linear negative relationship up until the time of writing of their contribution had generally received the greatest amount of support, even though some evidence has pointed to curvilinear and attenuated negative relationships as well. Their meta-analyses were based overwhelmingly on private-sector studies, however, and one may therefore question whether the results achieved by the literature up until now may be generalized to the US public sector context. While public sector organizations are moving towards more flexible models of employment, making them increasingly similar to private organizations in terms of management practices (e.g. Boyne, 2002, p.122; Selden & Moynihan, 2000), substantial remnants of traditional bureaucratic cultures, relatively rigid employment regulation and inflexible pay scales remain important differences (Gould-Williams, 2004; Meier & Hicklin, 2007). Given the combination of these potential generalizability issues and the relatively limited amount of studies conducted on the turnover-performance relationship in public sector organizations so far, the subparagraphs below develop alternative hypotheses based on all three perspectives into the relationship between turnover and performance.

2.1 A linear negative relationship

Much research on the causes of turnover is inspired by the thought that turnover is strongly dysfunctional for organizations and should therefore be avoided if possible (Meier & Hicklin, 2007). This reasoning is largely based on human capital theory, which focuses on the relationship between organization-specific human capital and organizational performance (Strober 1990). For supporters of this theory excess employee turnover would entail the loss of productive organization-specific human capital (Shaw, Gupta & Delery, 2005), as employees that have accrued valuable skills, experience, contacts and an affinity for the organization's culture and identity leave the organization (Call et al., 2015; Reilly et al., 2014; Park & Shaw, 2013; Hancock et al., 2013). Furthermore, the presence of a high rate of excess employee turnover indicates that sizeable amounts of replacements are made within the organization, meaning that new entrants will occupy relatively many positions within the organization. Even when these employees have substantial relevant experience, they may not offer the same

contribution to overall organizational human capital as their predecessors did (Call et al., 2015), for instance due to their reduced affinity with for instance the organization's tasks or its clientele (Ployhart, Weekley & Ramsey, 2009). As human capital is an antecedent of organizational performance, excess employee turnover will thus have a strongly negative effect on organizational performance. This negative effect is reinforced by the fact that organizations do not only face the cost of losing employees, but incur additional costs as they have to search for substitute employees (Sutherland, 2002).

In addition to the direct effects of excess employee turnover the organization is also confronted with various indirect negative effects (Park & Shaw, 2013). As discussed by Grinza (2014) such indirect costs can include: output forgone during the vacancy period and diminished productivity during the training process of new employees (Sutherland, 2002), organizational disruptions and loss of social capital (Dess and Shaw 2001; Shaw et al., 2005; Watous, Huffman & Pritchard, 2006; Nyberg & Ployhart, 2013), reduced unit cohesiveness (Reilly et al., 2014), lowered customer satisfaction (Jamal and Kamal 2002; Reilly et al., 2014) and negative effects on the morale of employees who stay (Sheehan 1993). Moreover, when employees leave the organization it may take some time before a replacement is found, requiring remaining employees to execute essential tasks with reduced manpower and thus increasing job demands (Reilly et al., 2014).

In sum, these arguments lead to the expectation that excess turnover negatively affects organizational productivity as organization-specific human capital is lost and costs are incurred when acquiring new entrants. This leads to the following hypothesis:

Hypothesis 1: There is a negative linear relationship between excess employee turnover and performance.

2.1 A negative attenuated relationship

This perspective offers a variation on human capital theory and is grounded in sociological literature and in learning curve theory. Based on a literature review, Price (1977: 119) concluded that "successively higher amounts of turnover will be found ultimately to produce, more often than not, successively lower amounts of effectiveness at a decreasing rate." Intuitively this makes sense, also for the excess turnover concept: when excess employee turnover is low, it is time-consuming for a new employee to build specific human capital that is equivalent to the average stayer. Yet when excess employee turnover is high, average organization-specific human capital accumulations are low by definition. Replacements can build equivalent human capital and attain the level of performance of leaving employees quickly. To put it in other words: when turnover rates are high, an organization typically replaces a short-tenured employee with a new employee who soon represents the same level of human capital accumulation and shows equivalent performance. The size of the negative effects of extra turnover will consequently be smaller. In contrast to a negative linear formulation (as in hypothesis 1), this point of view suggests a stronger negative effect on performance when quit rates increase from low to moderate and weaker as excess turnover rates continue to increase. As discussed by Shaw, Gupta and Delery (2005) and Shaw et al. (2005), a linear formulation will thus underestimate the effect of excess turnover rates at low levels and overestimates the effect at high levels. Based on the above we formulate following hypothesis:

Hypothesis 2: The relationship between excess employee turnover and performance is negative but is attenuated as turnover rates increase.

2.2 An inverted U-shaped relationship

While the two previously discussed perspectives emphasized the negative effects of turnover, a third perspective questions whether turnover is always detrimental to organizational performance, instead theorizing that some degree of excess employee turnover could also be beneficial (Glebbeek & Bax, 2004; Hancock et al., 2013; Grinza, 2014). This perspective was first developed by Dalton and Todor (1979: 225) who departed from the purely cost-based arguments for the negative effects of excess employee turnover. They argue that a minimum level of excess employee turnover is beneficial if the costs of replacing underperforming employees can be compensated through the higher performance of new entrants. Grinza (2014), Meier & Hicklin (2007) and Ilmakunnas, Maliranta & Vainiomäki (2005) similarly argue that excess turnover allows organizations to gradually match workers to their jobs. Underperforming workers will be inclined to leave the company, offering the organization an opportunity to find an employee better suited to the position. Such arguments imply that turnover is not *a priori* harmful to an organization, but should be evaluated on the basis of its costs and benefits brought to the organization (Abelson and Baysinger 1984; Meier & Hicklin, 2007; Nyberg & Ployhart, 2013).

Grinza (2014) also notes that the replacement of low productivity workers can bring ancillary advantages, as surviving employees become aware of the potential consequences of insufficient performance (McElroy, Morrow, and Rude 2001: 1294; Meier and Hicklin 2007). Moreover, it has been suggested that (excess) turnover can improve organizational performance by revitalization (Shaw, Gupta & Delery, 2005). In this view the entrance of new workers introduce relevant experience and novel insights into the organization, increasing innovation, flexibility and adaptability (Abelson and Baysinger 1984; Dubin, 1970; Dalton and Todor 1979; Kellough and Osuna 1995: 58). Some literature even points out that turnover rates that are too low can lead to skill stagnation, closed mindedness, and "trained incapacity" (Dalton and Todor 1979; Dubin 1970; Shaw, Gupta and Delery 2005). Even for highly productive employees, at some level of compensation a good employee's costs may exceed his/her costs(Abelson and Baysinger 1984). As discussed by Meier and Hicklin (2007) this problem may be more acute in the public sector due to the use of less flexible pay scales.

Based on the above argument one may assume that the relationship between excess employee turnover and organizational performance follows an inverted u-shaped curve (Meier and Hicklin 2007; Glebbeek & Bax, 2004; Abelson and Baysinger 1984). Despite the intuitive appeal of this argument, empirical evidence on the validity of the inverted u-hypothesis is to our knowledge sparse . Osterman (1987) referred to three studies that examined this relationship, but cautioned against generalization in organizational settings. More recently, Glebbeek & Bax (2004) found limited indications for an inverted u-shape relationship between turnover and performance in the context of temporary employment agencies.Meier and Hicklin (2007) found a similar relationship between teacher turnover and the performance of students on a standardized test (Texas Assessment of Academic Skills), although only when differentiating respondents according the difficulty of the task they performed. Finally, Hancock et al. (2013) provide some meta-analytic support for curvilinear relationships, but note that the relationship is weak and requires further examination.

Based on the above we construct the following hypothesis:

Hypothesis 3: The relationship between excess employee turnover and performance follows an inverted u-shaped curve: it is positive as excess employee turnover increases initially but becomes negative as it further increases.

Figure 1 presents an overview of the three directional hypotheses.

Please include Figure 1 here

2.3 The impact of excess turnover on the medium to long-term

In addition to the direction of the effect of excess turnover, it is important to consider that turnover rates may influence an organization's performance differently over time (Hinklin & Tracey, 2000) – although this factor has as of yet received relatively little attention in the literature (Glebbeek & Bax, 2004). Even though some empirical studies do indicate that incorporating time-lags provides a better model of the turnover-performance relationship (Glebbeek & Bax, 2004; Shaw, Gupta, Delery, 2005; Kacmar et al., 2006; Meier & Hicklin, 2007; Grinza, 2014), the time factor has largely been treated as a methodological choice and has received relatively little by way of theoretical development (although see Reilly et al., 2014 for an exception).

We firstly argue that although ongoing projects may incorporate new employees with relatively little detrimental effects on performance, the lack of experience of new hires will become more apparent once the organization transits towards newer projects. At this point the new hire will be confronted with a substantially more difficult task environment, without the required experience to operate efficiently and avoid mistakes (see also e.g. Meier & Hicklin, 2007 for a discussion of the relevance of task difficulty in non-routine areas). The performance of an organization with a great degree of excess turnover will therefore be undermined more profoundly once the established framework of an older project no longer applies and complex new choices must be made. Secondly, based on the literature on the integration of new employees we argue that hiring, training and supervising new entrants diverts the time and energy of more experienced workers away from developing and adapting projects (see on training and experience e.g. Chen, 2005; Dalton, Thompson & Price, 1977; Sengupta & Abdel-Hamid, 1993). As training and supervision in particular are medium to long-term processes

(Bishop, 1991), the costs of excess employee turnover may accumulate over time. Simultaneously, as the capacity of experienced employees is limited, training devoted to new entrants will go at the cost of mentoring employees who were already settled in the organization, but nonetheless possess limited experience (Reilly, et al. 2014). Thus, the combination of a reduced amount of experience in the organization and the costs incurred in training new personnel may cause a performance drop several months later.

Similarly, the potential positive effects of excess turnover, argued to exist by proponents of the inverted u-shaped curve, may also manifest themselves in a delayed manner. For instance, if an insufficiently performing employee is replaced by a more suitable candidate, the new hire will still require training, socialization and experience to become familiarized with the organization and his/her position (Bishop, 1991; Kacmar et al., 2006). At first, the replacement's productivity will therefore likely not differ much from his/her underperforming but more experienced and integrated predecessor. However, once the replacement acquires more experience his/her performance will increase (Bishop, 1991; Lee et al., 2006; Call et al., 2015). Thus, the performance increase resulting from a better fit between the organization and its employees should also only become apparent in performance figures after several months. Treating the potential delayed effects of excess turnover as a theoretical focus, without making an *a priori* judgment on the direction of the delayed effect, leads us to the following fourth hypothesis:

Hypothesis 4: The effect of excess employee turnover on performance manifests itself in a delayed manner.

3 Data and Main Variables

The data used in this paper combines two different publicly available data sources: the Federal Employee Viewpoint Survey (FEVS) and archival datasets of the US Office of Personnel Management (OPM) Fedscope. Five consecutive waves of the FEVS, running from 2010 to 2014, have been used. The FEVS is a tool that measures employees' perceptions of whether, and to what extent, conditions which are believed to characterize successful organizations are present in their agencies. The survey is administered by the US Office of Personnel Management and targets full-time, permanent employees of departments and large agencies, as well as those small/independent agencies that accepted an invitation to participate in the survey. It is administered annually in April to a sample of Federal employees based on a graduated proportional sampling plan.

To ensure the representativeness of our analyses we utilize weighted data. The weight indicates the number of employees in the survey population the respondent represents. Information about demographic characteristics, such as gender, race, supervisory status, age, and organization size, are used to develop the weights.ⁱⁱ Although different waves of the survey are used, they are not panel data since respondents have not been followed over time. Nevertheless, by calculating means for the necessary variables per organization it is possible to link the data per organization over the year (see also Wynen and Op de Beeck 2014). This approach allows us to create panel data, although with some loss of detail, as the data is created at the organizational level instead of the individual level. This has been combined with turnover and employment data from the Office of Personnel Management.ⁱⁱⁱ For each year information was retrieved on the total amount of employees (at the end of March), the number of leaves (between April and March) as well as the number of new entrants (between April and March). This data-gathering method resulted in a balanced panel of 73 organizations over five years. The following two subsections explain in detail how this data was utilized to operationalize performance and excess turnover.

3.1 Measuring performance

Measuring and comparing performance across public sector organizations is notoriously difficult (Dess & Robinson Jr., 1984; Helm, Mauroner & Pöhlmann, 2016; Gillenkirch & Kreienbaum, 2016). To be able to do so, this article makes use of a perceptual indicator of performance. More precisely, employees were asked the following question: "How would you rate the overall quality of work done by your work group?" Respondents rated performance from 1 to 5, with 1 representing "very poor" and 5 representing "very good". This is a subjective performance measure, and one that involves employee assessment rather than a more objective, quantifiable measure.

Self-report indicators on perceived performance have the substantial drawback that they suffer from social desirability bias, as respondents tend to overestimate the performance of their own organization (Gillenkirch & Kreienbaum, 2016). However, given that this study attempts to examine the differences in performance between organizations instead of their absolute levels of performance, the effects of this issue are not expected to influence the results of the analysis substantially. Moreover, although social desirability is certainly an issue to take into account, perceived performance holds several advantages over other types of performance indicators that make its usage more suitable for the purposes of this article. Its primary advantage is that perceived performance data is comparable across organizational boundaries (Allen et al., 2007; Gillenkirch & Kreienbaum, 2016), while other performance indicators based on output or outcome are often either tailor-made for specific organizations or interpreted differently per organization (Van Thiel & Leeuw, 2002).

Additionally, it should be taken into account that objective output and outcome indicators suffer from their own downsides, including their difficulties in measuring the full scope and quality of services delivered by public sector organizations (Meier & Hicklin, 2008) and their tendency to solely focus on some aspects of the balance between values that public organizations inevitably have to weigh – including lawfulness, efficiency, predictability, effectiveness, equality before the law and justice (De Bruijn, 2002; Van Thiel & Leeuw, 2002). As perceived performance data relies on the cognitive judgments of individuals regarding the sum of activities, output and outcomes of their organizations, it suffers from these issues to a lesser extent (Dess & Robinson Jr., 1984). The combination of comparability beyond organizational borders and its reduced degree of under-inclusiveness therefore make an operationalization using perceived performance data the desired method for our purposes. Nevertheless, it is worth emphasizing here that additional research utilizing various forms of output and/or outcome data would provide a welcome supplement to the findings of this article (see e.g. Dess & Robinson Jr., 1984).

3.2 Measuring excess employee turnover

Excess employee turnover captures both the impact of hiring and replacing employees, but excludes the influence of changes in organizational size (Burgess, Lane & Stevens, 2000). Excess turnover is therefore often utilized in situations where it is undesirable to include turnover resulting from the growth or decline of total employees in the organization, with examples being studies into the differences in the rates of replacement of fixed-term versus open-term contract workers (Centeno & Novo, 2012), or studies into the influence of fringe benefits on turnover (Dale-Olson, 2006). For our purposes, we are mainly interested in estimating the relationship of turnover events on performance, but wish to exclude the effect of downsizings and expansions of organizations. However, given the turbulence generated for

instance by the 2009 financial crisis in the US public sector, it is likely that we include effects of various size-reducing austerity measures and other organizational changes if we utilize regular turnover rates in our models. Thus, utilizing excess turnover instead of more traditional turnover rates provides us with a more appropriate estimate of the effect of turnover on performance.

Excess turnover is calculated as the difference between:

- (1) The job turnover rate: the sum of the (a) inflow and (b) outflow of employees in the organization.
- (2) The net change of employment: difference between the (a) inflow and (b) outflow of employees in the organization.

Which may be expressed as:

Excess turnover = *Inflows* + *Outflows* - (*Inflows* - *Outflows*)

For instance, if an organization starts with 50 employees, but subsequently hires 8 and loses 6 of its workers, it ends up with a total of 52 employees. In this example the organization experienced an employee turnover of 14 (8 hires + 6 exits). The net change of employment equals 2 as the difference between inflow and outflow, representing job creation, is 8 - 6. Excess employee turnover then equals the difference between the job turnover rate and the net change of employment, or 14 - 2 = 12. Correcting the job turnover rate for the net change in employment allows us to focus specifically on the replacement of employees, instead of the growth or shrinkage of an organization.

Following Davis and Haltiwanger (1992), we divided excess employee turnover by the total number of employees. Whereby total number of employees is defined as the sum of the number of employees on 1 April and 31 March of a given year divided by two.

3.3 Control variables

We include several additional variables in the model to account for other influences on the performance of an organization. This helps in preventing an over- or underestimation of the effect of excess turnover on perceived performance by reducing the model's omitted variable bias. First, an index is included which reflects Human capital and capacity (HCC). People are often seen as the key for achieving high performance (Osborne and Gaebler 1992; Pfeffer 1994; Becker and Gerhart 1996; Rainey 1997). In support of this view, several empirical studies have confirmed that certain human resource management (HRM) practices are strongly related to high performance in organizations (Delaney and Huselid 1996; Martell and Carroll 1995; Kalleberg and Moody 1994; Terpstra and Rozell 1993; Haltiwanger, Lane and Spletzer 1999). The key components of HRM are building human capital through recruitment and employment processes, retaining high performing human capital, maintaining sufficient human capacity to do the agency's work, and providing employees with sufficient training. We therefore construct an index HCC based on Brewer and Selden (2000) that includes items on building human capital, retaining high performing human capital, maintaining adequate human capital and training (see Table 4 in appendix for more detailed information).^{iv}

Second, we account for the effect of an organization's *leadership* on performance. Leadership styles have been found in recent literature to strongly affect public sector performance (Boyne 2003; Moynihan and Ingraham 2004; Fernandez 2005; Parry and Sinha 2005; Van Wart 2013; Hassan and Hatmaker 2015; Kashyap & Rangnekar, 2016; Liu & Lin, 2017). We therefore construct an index on leadership (*Lead*) based on two broad survey questions: "I have trust and confidence in my supervisor," and "Overall, how good a job do you feel is being done by your immediate supervisor/team leader?" Both items are strongly related and produce a Cronbach's alpha of 0.99. Moreover, factor analysis confirms the reliability of the index, as both indicators load on the same factor.

Apart from both these variables we include control variables on the average age of respondents within an organization, the ratio of men versus women and organizational size.

3.4 Summary statistics

In Table 1 summary statistics of our data have been presented. Organizations have on average 9340 employees and score 4,224 on the performance measure with a standard deviation of 0.132. However, 25% of all organizations in our sample have fewer than 4,700 employees while 75% of all organizations are smaller than 16,170 employees. Moreover, the workforce of organizations appears to consist of 60% men. Separation and accession rates are on average 0.113 and 0.115 leading to an average net job creation of 0.002. The mean turnover rate equals 0.228; and the average excess employee turnover rate is 0.184.

Please include Table 1 here

4 Results

In order to estimate the link between excess employee turnover and organizational performance we employ System-GMM estimation, which is capable of overcoming both the endogeneity issue of OLS and Fixed Effects estimators and establishing causality on the basis of panel data (Aranello & Bond, 1991).^v The regression results on the link between excess

employee turnover and organizational performance are presented in Table 2. In principle, the level of measurement of our dependent (a Likert-type variable) is ordinal. Yet, we are treating the measurement as if it were continuous. As discussed in literature (see for instance Angrist and Pischke, 2009) this should however matter little. More precisely, the simplicity of interpretation outweighs the technical correctness hereof.

Please include Table 2 here

The System-GMM approach is robust to heteroscedasticity since the robust two-step version is employed. The Windmeijer's correction has been applied in order to solve the problem of the two-step variance-covariance being strongly downward biased (see also Arellano and Bond 1991 and Grinza, 2014). Table 2 also reports on some System-GMM diagnostics. These include the Hansen J statistic, which tests for the validity of the over-identifying restrictions imposed by the model, and includes test statistics for first- and second-order serial correlation of the first differenced residuals.

The GMM diagnostics reveal that our instruments are valid ($\chi^2(20) = 28.14$; p-value of 0.106 & $\chi^2(19) = 22.21$; p-value of 0.27393), furthermore the test statistic for the first-order serial correlation (m_1) strongly rejects the null hypothesis while the test statistic for the second-order serial correlation (m_2) supports the null hypothesis of no serial correlation. This is coherent with our model. The same holds for table 3 where the test statistic for the first-order serial correlation strongly rejects the null hypothesis while the test statistic for the second-order correlation supports the null hypothesis of no serial correlation. Moreover also within this model, the instruments appear to be valid ($\chi^2(44) = 39.61$; p-value of 0.66; $\chi^2(36) = 29.52$; p-value of 0.76 & $\chi^2(36) = 38.14$; p-value of 0.37).

When examining the results, no direct effect for excess employee turnover can be observed. Yet we notice a significant lagged effect for excess employee turnover on performance. Results indicate that the degree of excess employee turnover does not affect performance immediately, but does so in a delayed manner.^{vi}

This would mean the negative side effects of losing and replacing employees can be supported for some months. We believe that this observation can be explained through two mechanisms. The first explanation centers on the direct effect of human capital on performance, and presupposes that employees' contributions to projects may – at least in the short to medium term – outlast their presence in the organization. A project set up by a more experienced employee that has since left the organization may for instance benefit from the initial project design and established work-processes - i.e. aspects of the explicit knowledge that can relatively easily be transferred by exiting workers to other organizational members (Droege & Hoobler, 2003). However, as after several months environmental and internal changes start necessitating new decisions taken by less experienced employees, tacit knowledge becomes increasingly important and the beneficial effects of the former employees' experience are more 2008; Droege 2003). likely to be lost (Calo. & Hoobler. Under these circumstances, performance reductions begin to manifest themselves more profoundly.

A second possible explanation for this observation, inspired on transaction cost economics and CET theory, is that managers in such organizations will be able to continue to make short-term operational decisions, but other long-term commitments may be postponed due to the increase in job demands (Reilly et al., 2014). Managers will be preoccupied with finding replacements and taking care that the day-to-day working of the organization is not jeopardized. Long-term decisions are suspended; hence negative effects of excess employee turnover only become visible after some time. This effect can be reinforced by the organizations being short-staffed, resulting in dedicated workers being hard-pressed to accomplish necessary tasks (Reilly et al., 2014; Nyberg & Ployhart, 2013). In such circumstances employees may have little time and/or patience to train new workers. This in turn leads to a negative effect in the long run when replacements have been found and have to be trained.

Please include Table 3 here

In order to examine whether the relationship between excess employee turnover and organizational performance follows a non-linear pattern (see hypotheses 2 and 3), squared and cubic terms of excess employee turnover, lagged excess employee turnover and the accumulated version (2-year) of excess employee turnover have been included in Table 3. If excess turnover has a non-linear effect on performance, the squared or cubic term should be significant. In order to confirm hypothesis 2, a significant positive squared term is required, while an insignificant squared term but significant positive cubic term confirms hypothesis 3.

Based on Table 3, no support can be found for a non-linear effect of excess employee turnover on organizational performance. None of the squared or cubic terms proof to be significant. Hypotheses 2 and 3 are therefore not supported by our data.

Based on our results, excess employee turnover appears to have a linear negative effect on performance as depicted by traditional human capital theory. Losing and replacing employees entails a loss of productive organization-specific human capital which is always dysfunctional for the organization (Calo, 2008; Park & Shaw, 2013). However, the negative effect of excess turnover only manifests itself in a delayed manner; it takes time before the consequences of excess turnover seep into the performance of public organizations.

The control variables suggest that in addition to time-lagged excess employee turnover, the gender ratio and organizational leadership are also determinants of perceived performance.

21

Both variables are significantly related to perceived performance in the time-lagged and nontime-lagged models, with an increase in the percentage of male employees resulting in a negative effect on perceived performance and an increase in the opinion of organizational leadership being related to an increase of perceived performance.

5 Discussion and Conclusion

Our results consistently support a negative linear relationship between excess employee turnover and organizational performance, thus providing support for hypothesis 1. Furthermore, results show that the delayed negative effect of excess turnover remains the same, whether or not an organization is confronted with a large degree of excess employee turnover or just with a small amount. It seems that for public sector organizations, higher degrees of excess turnover lead to a decrease in human capital and an indirect strain on remaining resources (Park & Shaw, 2013). This is an intuitive result given the characteristics of many public sector organizations. Public organizations are often concerned with various forms of social service delivery, supervisory tasks, or various forms of policy development and implementation. These contexts lend themselves well to increased experience, knowledge and an established social network (see also Meier & Hicklin, 2007). As on average employees in organizations with high degrees of excess turnover will possess less of these resources, and as more experienced workers are required for training and supervision and internal social ties are disrupted (Ployhart, Weekley & Ramsey, 2009), a performance drop is a logical consequence.

These results imply that public organizations should consistently try to prevent excess employee turnover. This does not mean that organizations should avoid replacing underperforming employees, but organizations should first try to counsel, coach and correct unproductive behavior. Moreover, the results of this study suggest that an active employee retention policy may be beneficial, for instance by giving well-performing employees raises and bonuses when appropriate (Lee & Maurer, 1997). Organizations could also explore other avenues to increase factors such as organizational welfare and job satisfaction – both being often observed antecedents to turnover (Coomber & Barriball, 2007; Lee & Whitford, 2008). However, the non-significant result of human resource management initiatives included in the human capital index on the performance of organizations seems to indicate that the effect of such policies may be limited.

The analyses also provide evidence for hypothesis 4, suggesting that excess turnover does not affect organizational performance directly, but in delayed manner. We speculate that this result is in part due to the medium to long-term aspects of training, supervising and socializing new entrants in the organization (Ployhart, Weekley & Ramsey, 2009). On the one hand these new entrants will not be as productive as their predecessors during their initial months in the organization, leading to a drop in performance on the medium-term (Nyberg & Ployhart, 2013). On the other hand more experienced colleagues will be required to devote substantial attention to the supervision of these new candidates over a prolonged period of time (Reilly et al., 2014). Furthermore, as mentioned in the results section, managers faced with the issue of finding and supervising replacements may only be able to fulfill their short-term commitments, as they no longer have time to devote to long-term issues. Moreover, it would be worth examining in future research if new entrants perform less well in the complex decisions they will be forced to make several months into their tenure in the new organization, once the framework provided by their predecessors upon entry into the organization no longer suffices.

Throughout the analysis a substantial amount of attention has been paid to the identification of the causal effect of excess employee turnover. Attention was specifically devoted to endogeneity issues, deriving from both unobserved fixed-effects and simultaneity

problems. Unobserved fixed components and on-the-job search effect have been carefully accounted for through our choice for System-GMM estimation.

Some remaining limitations to this study warrant mentioning, however. First and foremost, organizational performance and some of the explanatory variables (HCC and Organizational Leadership (Lead) reflect employee perceptions of phenomena for which there are no direct data. As discussed, however, direct performance data is difficult to compare between organizations, making perceived performance data a relatively attractive alternative for our purposes. As discussed by Pitts (2009), while employee perceptions are not ideal, it is one of the only means through which to draw comparisons between organizations at the federal level. A second problem concerns concept operationalization. Human capital and capacity as well as leadership were identified as determinants of organizational performance based on existing literature (e.g. Brewer and Selden 2000) They are operationalized using items from the FEVS. This survey, while usable, is suboptimal for the study of human capital and capacity, as it contains a relatively low amount of items on both concepts and does not tap into very specific aspects of each variable. Although both indexes currently have a relatively high reliability, subsequent research would benefit from a more nuanced approach.

Additionally, while our contribution finds important results with regards to the generalizability of the linear negative relationship between excess turnover and performance – a relationship also often found in turnover research in the private sector (Park & Shaw, 2013) – we lacked the data necessary to investigate whether this relationship holds for different types of tasks. It could be that organizations with substantially complex and non-standardized tasks, requiring highly educated professionals with substantial degrees of autonomy, display a non-linear relationship between both variables. For such tasks, influxes of human capital may provide a new stimulus for new modes of problem-solving, thus reducing the organization's rigidity and increasing performance when a limited amount of excess turnover occurs (Meier

& Hicklin, 2007). On the other hand, large amounts of replacements may detrimentally affect the human capital within the organization, as finding enough suitable replacements and integrating them in the organization is a difficult prospect (Park & Shaw, 2013). Indeed, this argument is supported by Meier & Hicklin (2007), and thus requires additional exploration. Similarly, our findings are limited by their US context, raising the question of their generalizability to for instance continental European countries, traditionally characterized by relatively Unionized labor markets and that have long valued lifelong careers in the public sector.

Further research into the relationship between excess employee turnover and organizational performance is necessary, in particular due to the conflicting results that have been reached up until now. Meier and Hicklin (2007), for instance, in one of the few public sector studies on this topic, are one of the few finding evidence of an inverted u-shape relationship between turnover and performance. However, they only find this effect when differentiating for task difficulty and their results only target one specific type of organization. Moreover, their research relies on turnover and did not account for excess employee turnover. More recent research by Grinza (2014) on 2,619 manufacturing firms did focus on excess employee turnover and did not find an effect of excess employee turnover on organizational performance even when taking task difficulty into account. Although our study did account for excess employee turnover we were not able to differentiate to task difficulty. Adding this to public sector studies on the link between excess employee turnover and organizational performance would be a timely contribution to literature.

Furthermore, additional research into the underlying mechanisms that we have proposed with regard to the relevance of time-lags in our data seems necessary. In particular, it would be worth examining if new entrants perform less well in the complex decisions they will be forced to make several months into their tenure in the new organization, once the framework provided by their predecessors upon entry into the organization no longer suffices – an aspect which has been scarcely explored in the literature. Moreover, given that little is known about how a wide range of other organizational factors influence the relationship examined in this study, other factors such as organizational slack and size growth should be integrated in the turnover-performance agenda. Another issue worth exploring is the generalizability of these findings across different public sectors, for instance through a study incorporating multiple countries. Finally, more effort should be devoted to studying how the dynamics of turnover and excess turnover differ, and the extent to which findings of one research line are generalizable to the other.

6 References

- Abelson, M., and Baysinger, B. (1984), Optimal and Dysfunctional Turnover: Toward an Organizational Level Model, *Academy of Management Review*, 9:2, pp. 331-342
- Allen, R.S., Dawson, G., Wheatley, K., White, C.S. (2007), Perceived diversity and organizational performance, Employee Relations, 30:1, pp.20-33
- Arellano M., Bond, S. (1991), Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *The Review of Economic Studies*, 58:2, pp.277–297
- Becker, B., Gerhart, B. (1996), The impact of human resource management on organizational performance: progress and prospects, The Academy of Management Journal, 39:4, pp.779-801
- Bishop, J.H., (1991), On the job training of new hires, in: Stern, D., Ritzen, J. (eds.), Market failure in training? New Economic Analysis and Evidence on Training of Adult Employees, Berlin: Spring-Verlag, pp. 61-98

- Brewer, G.A., Selden, S.C. (2000), Why Elephants Gallop: Assessing and Predicting Organizational Performance in Federal Agencies, *Journal of Public Administration Research and Theory*, 10:4, pp.685-711
- Brown, C., Medoff, J. (1978). Trade Unions in the Production Process, *Journal of Political Economy*, 86, pp.355–378
- Boyne, G.A. (2003), What is Public Service Improvement?, *Public Administration*, 81, pp.211-228
- Boyne, G.A., Jenkins, G., Poole, M. (1999), Human resource management in the public and private sectors: an empirical comparison, *Public Administration*, 77:2, pp.407-420
- Call, M.L., Nyberg, A.J., Ployhart, R.E. (2015), The dynamic nature of collective turnover and unit performance: the impact of time, quality and replacements, Academy of Management Journal, 58:4, pp.1208-1232
- Caillier, J.G. (2013), Are Teleworkers Less Likely to Report Leave Intentions in the United States Federal Government than Non-Teleworkers Are?, *American Review of Public Administration* 43:1, pp.72–88
- Calo, T.J. (2008), Talent management in the era of the aging workforce: the critical role of knowledge transfer, *Public Personnel Management*, 37:4, pp.403-416
- Chen, G. (2005), Newcomer adaptation in teams: multilevel antedecents and outcomes, The Academy of Management Journal, 48:1, pp.101-116
- Choi, S. (2009), Diversity in the U.S. Federal Government: Diversity Management and Employee Turnover in Federal Agencies, *Journal of Public Administration Research* and Theory 19:3, pp.603–30
- Coomber, B., Barriball, K.L. (2007), Impact of job satisfaction components on intent to leave and turnover for hospital-based nurses: a review of the research literature, *International Journal of Nursing Studies*, 44, pp.297-314

- Dalton, D.R., Todor, W.D. (1979), Turnover turned over: An expanded and positive perspective, *Academy of Management Review*, 4, pp.225-235
- Dalton, G.W., Thompson, P.H., Price, R.L. (1977), The four stages of professional careers a new look at performance by professionals, Organizational dynamics, 6:1, pp.19-42
- Davis, S.J., Haltiwanger, J.C. (1992), Gross Job Creation, Gross Job Destruction and Employment Reallocation, *Quarterly Journal of Economics*, 107:3, pp.819–63
- De Bruijn, H. (2002), Performance measurement in the public sector: strategies to cope with the risks of performance management, International Journal of Public Sector Management, 16:7, pp.578-594
- Decramer, A., Smolders, C., Vanderstraeten, A. (2012), Employee performance management culture and system features in higher education: relationship with employee performance management satisfaction, *The International Journal of Human Resource Management*, 24(2), pp.352-371
- Delaney, J.T., Huselid, M.A. (1996), The impact of human resource management on perceptions of organizational performance, *Academy of Management Journal*, 39, pp.949-969
- Dess G.G., Shaw J.D. (2001), Voluntary turnover, social capital, and organizational performance, *Academy of Management Review*, 26:3, pp.446–456
- Dess, G.G., Robinson Jr., R.B. (1984), Measuring organizational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit, *Strategic Management Journal*, 5:3, pp.265-273
- Droege, S.B., Hoobler, J.M. (2003), Employee turnover and tacit knowledge diffusion: a network perspective, *Journal of Managerial Issues*, 15:1, pp.50-64

Dubin, R. (1970), Work in modern society, Journal of Management Studies, 7, pp.5-36

Fernandez, S. (2005), Developing and testing an integrative framework of public sector leadership: Evidence from the public education arena. *Journal of Public Administration Research and Theory*, 15, pp.197–217

- Glebbeek, A.C., Bax, E.H. (2004), Is high employee turnover really harmful? An empirical test using company records, *Academy of Management Journal*, 47:2, pp.277-286
- Gillenkirch, R.M., Kreienbaum, H. (2016), What guides subjective performance evaluation: incentive alignment or norm enforcement?, *Review of Managerial Science*, pp.1-25
- Gould-Williams, J. (2004), The effects of 'high commitment' HRM practices on employee attitude: the views of public sector workers, Public Administration, 82:1, pp.63-81
- Grinza, E. (2014), Excess worker turnover and firm productivity, retrieved on 14-09-2016 from: http://paneldataconference2015.ceu.hu/Program/Elena-Grinza.pdf
- Hancock, J.I., Allen, D.G., Bosco, F.A., McDaniel, K.R., Pierce, C.A. (2013), Meta-analytic review of employee turnover as a predictor of firm performance, *Journal of Management*, 39:3, pp.573-603
- Haltiwanger, J.C., Lane, J.I., Spletzer, J.R. (1999), Productivity differences across
 employers: The roles of employer size, age, and human capital, *American Economic Review*, 89, pp.94-98
- Hassan, S., Hatmaker, D.M. (2015), Leadership and performance of Public Employees:
 Effects of the Quality and Characteristics of Manager-Employee Relationship, *Journal of Public Administration Research and Theory*, 25:4, pp.1127-1155
- Helm, R., Mauroner, O., Pöhlmann (2016), Towards a better understanding of performance measurements: the case of research-based spin-offs, *Review of Managerial Science*, pp.1-32, doi:10.1007/s11846-016-0217-9
- Hinklin, T.R., Tracey, J.B. (2000), The cost of turnover: putting a price on the learning curve, The Cornell Hotel and Restaurant Administration Quarterly, 41:3, pp.14-21

- Jamal, A., Kamal, N. (2002), Customer satisfaction and retail banking: an assessment of some of the key antecedents of customer satisfaction in retail banking, *International Journal of Bank Marketing*, 20:4, pp.146–160
- Jung, C.S. (2010), Predicting Organizational Actual Turnover Rates in the U.S. Federal Government, *International Public Management Journal*, 13:3, pp.297–317
- Kacmar, K.M., Andrews, M.C., Van Rooy, D.L., Steilberg, R.C., Cerrone, S. (2006), Sure everyone can be replaced... but at what cost? Turnover as a predictor of unit-level performance, *Academy of Management Journal*, 49:1, pp.133-144
- Kalleberg, A.L., Moody, J.W. (1994), Human resource management and organizational performance. *American Behavioral Scientist*, 37, pp.948–962
- Kashyap, V., Rangnekar, S. (2016), Servant leadership, employer brand perception, trust in leaders and turnover intentions: a sequential mediation model, *Review of Managerial Science*, 10:3, pp.437-461
- Kellough, J.E., Osuna, W. (1995), Cross-agency comparisons of quit rates in the federal service: Another look at the evidence, *Review of Public Personnel Administration*. 15:4, pp.58-68
- Lee, Y., Nam, J., Park, D., Lee, K.A. (2006), What factors influence customer-oriented prosocial behavior of customer-contact employees?, Journal of Services Marketing, 20:4, pp.251-264
- Lee, S.Y., Whitford, A.B. (2008), Exit, Voice, Loyalty, and Pay: Evidence from the Public Workforce. *Journal of Public Administration Research and Theory*, 18:4, pp.647–71
- Lee, T.W., Maurer, S.D. (1997), The retention of knowledge workers with the unfolding model of voluntary turnover, *Human Resource Management Review*, 7:3, pp.247-275

- Liu, C.M., Lin, C.P. (2017), Assessing the effects of responsible leadership and ethical on behavioral intention, *Review of Managerial Science*, pp.1-22, doi:10.1007/s11846-017-0236-1
- Martell, K., Carroll, S.J. (1995), How Strategic is HRM?, *Human Resource Management*, 34:2, pp.253-267
- McElroy, J.C., Morrow, P.C., Rude, S.C. (2001), Turnover and organizational performance:
 A comparative analysis of voluntary, involuntary, and reduction-in-force turnover.
 Journal of Applied Psychology 86: 1294–1299
- Meier, K.J., Hicklin, A. (2007), Employee turnover and organizational performance:
 Testing a hypothesis from classical public administration, *Journal of Public Administration Research and Theory*, 1:8, pp.573–590
- Mitchell, T.R., Holtom, B.C., Thomas W.L., Sablynski, C.J., Erez, M. (2011), Why people stay: using job embeddedness to predict voluntary turnover, *The Academy of Management Journal*, 44:6, pp.1102-1121
- Moynihan, D.P., Ingraham, P.W. (2004), Integrative leadership in the public sector: A model of performance information use, *Administration & Society*, 36, pp.427–453
- Murmann, M. (2015), *The Productivity effects of excess labour turnover in young firms*, paper presented at Druid15, Rome, June 15-17
- Osborne, D., Gaebler, T. (1992), Reinventinggovernment: How the entrepreneurial spirit is transforming the public sector, Reading, MA: Addison-Wesley
- Osterman, P. (1987), Choice of employment systems in internal labor markets, *Industrial Relations*, 26:1, pp.46-67
- Park, T.Y., Shaw, J.D. (2013), Turnover rates and organizational performance: a metaanalysis, *Journal of Applied Psychology*, 98:2, pp.268-309

- Parry, K.W., Paresha, N.S. (2005), Researching the Trainability of Transformational
 Organizational Leadership, *Human Resource Development International*, 8:2, pp.165-183
- Pencavel, J.H. (1972), Wages, specific training, and labor turnover in U.S. manufacturing industries, *International Economic Review*, 13:1, pp.53-64
- Peters, J. (2012), Neoliberal convergence in North America and Western Europe: fiscal austerity, privatization, and public sector reform, *Review of International Political Economy*, 19:2, pp.208-235
- Pfeffer, J. (1994), *Competitive advantage through people*, Harvard Business School Press: Boston, MA
- Pitts, D.W. (2009), Diversity Management, Job Satisfaction, and Performance: Evidence from U.S. Federal Agencies, *Public Administration Review*, 69:2, pp.328–338
- Pitts, D.W., Marvel, J., Fernandez, S. (2011). So Hard to Say Goodbye? Turnover Intention among U.S. Federal Employees. *Public Administration Review*, 71:5, pp.751–760
- Ployhart, R.E., Weekley, J.A., Ramsey, J. (2009), The consequences of human resource stocks and flows: a longitudinal examination of unit service orientation and unit effectiveness, *The Academy of Management Journal*, 52:5, pp.996-1015

Price, J.L. (1977), The study of turnover, Ames, IA: Iowa State University Press.

- Rainey, H.G. (1997), *Understanding & managing public organisations*, second edition, San Francisco: Jossey-Bass
- Reilly, G., Nyberg, A.J., Maltarich, M., Weller, I. (2014), Human capital flows: using context-emergent (CET) theory to explore the process by which turnover, hiring and job demands affect patient satisfaction, *Academy of Management Journal* 57(3), 766-790

- Roodman, D. (2009), How to do xtabond2: An introduction to difference and system GMM in Stata, *Stata Journal*, 9:1, pp.86-136
- Rubin, E.V. (2009), The Role of Procedural Justice in Public Personnel Management: Empirical Results from the Department of Defense, *Journal of Public Administration Research and Theory*, 19:1, pp.125–43
- Shaw, J.D., Duffy, M.K., Johnson, J.L., Lockhart, D.E. (2005), Turnover, social capital losses, and performance, *Academy of Management Journal*, 48:594-606
- Shaw, J.D., Gupta, N., Delery, J.D. (2005), Alternative conceptualizations of the relationship between voluntary turnover and organizational performance, *Academy of Management Journal*, 48, pp.50-68.
- Sengupta, K., Abdel-Hamid, T.K. (1993), Alternative conceptions of feedback in dynamic decision environments: an experimental investigation, *Management Science*, 39:4, pp.411-428
- Sheehan, E.P. (1993), The Effects of Turnover on the Productivity of Those Who Stays, Journal of Social Psychology, 133, pp.699–706
- Strober, M.H. (1990), Human capital theory: Implications for HR managers, *Industrial Relations*, 29:2, pp.214-239.
- Sutherland J. (2002), Job-to-job turnover and job-to-non-employment movement: A case study investigation, *Personnel Review*, 31:6, pp.710–721.
- Terpstra, D.E., Rozell, E.J. (1993), The relationship of staffing practices to organizational level measures of performance, *Personnel Psychology*, 46, pp.27-48.
- Van Thiel, S., Leeuw, F.L. (2002), The performance paradox in the public sector, Public Performance & Management Review, 25:3, pp.267-281
- Van Wart, M. (2013), Lessons from leadership theory and the contemporary challenges of leaders, *Public Administration Review*, 73:4, pp.553-565.

- Watrous, K.M., Huffman, A.H., Pritchard, R.D. (2006), When coworkers and managers quit: the effects of turnover and shared values on performance, *Journal of Business and Psychology*, 21:1, pp.103-126
- Wynen, J., Op de Beeck, S. (2014), The Impact of the Financial and Economic Crisis on Turnover Intention in the U.S. Federal Government, *Public Personnel Management* 43:4, pp.565-585.

7 Tables and Figures

Figure 1 Different hypotheses on the relationship excess employee turnover and organizational performance.



Excess Employee Turnover

Table 1 Summary statistics

Variables	Notes	Mean	Std. Dev.	1st Q.	Median	3rd Q.
Performance	Mean score on the question "How would you rate the overall quality of work done by your work unit?" (5 categories ranging from very poor to very good)	4.224	0.132	4.153	4.227	4.295
Human capital &capacity	Index including items on: building human capital; retaining high performing human capital & maintaining adequate human capacity. See appendix for more information.	3.104	0.190	2.981	3.091	3.199
Leadership	Index based on the following questions: I have trust and confidence in my supervisor & Overall, how good a job do you feel is being done by your immediate supervisor/team leader?	3.871	0.164	3.775	3.880	3.954
Emplo (log)	Equals the log of the total employees working for a given organization between t and t-1	9.142	1.021	8.455	9.182	9.691
% Separations	Equals the $\%$ of employees which separated from a given organization between t- 1 and t	0.113	0.093	0.063	0.087	0.126
% Accessions	Equals the percentage of employees which are hired by a given organization between t-1 and t	0.115	0.093	0.057	0.091	0.142
% Employee turnover	Sum of the percentage separations and accessions in a given organization between t-1 and t	0.228	0.175	0.127	0.185	0.258
% Net job creation	Is given by the relative difference between the number of employees in a given organization at time t and t-1	0.002	0.063	-0034	-0.001	0.037
% Excess employee turnover	Is given by the relative difference between employee turnover and the absolute value of net job creation	0.184	0.165	0.094	0.144	0.211
Gender (Men=1)	Percentage of men working for a given organization	0.606	0.125	0.549	0.643	0.696
Age	Mean age of employees working in a given organization (categories: under 40; 40-49; 50-59; 60 or older)	2.362	0.213	2.258	2.411	2.520

Variables	SYSTEM-GMM				
Excess Employee Turnover	-0.0288	0.0372			
	(0.0357)	(0.0422)			
Human Capital & Capacity	0.107	0.022			
	(0.068)	(0.0757)			
Leadership	0.310***	0.378***			
	(0.063)	(0.069)			
Ratio men/women	-0.081**	-0.099***			
	(0.0293)	(0.034)			
Average age	0.0184	0.0171			
	(0.0190)	(0.0244)			
Size (FTE)	-0.001	-0.002			
	(0.00327)	(0.004)			
Excess Employee Turnover prior year		0.067**			
		(0.0322)			
Performance prior year	0.436***	0.444***			
	(0.073)	(0.08)			
Period	2010-2014				
Organizations	73	73			
Observatios	292	292			
Serial Correlation Tests					
<i>m</i> ₁	-4.55***	-4.71***			
<u></u>	0.41	0.79			
Over-identification Tests					
Hansen (df)	$\chi^2(20)=28.14$	$\chi^2(19)=22.21$			

Table 2 Estimation results—dependent variable: Excess employee turnover (% of total employees); estimation method: System-GMM

NOTE: Parameter estimates appear first and robust standard errors appear in parentheses. * indicates statistical significance at the 10% level. ** indicates statistical significance at the 5% level. *** indicates statistical significance at the 1% level. All models include a complete set of time dummy variables. The Size (FTE) variable is in natural logarithm. m_1 and m_2 are the test statistics for first- and second-order serial correlation of the first differenced residuals. The test statistic is for the null-hypothesis of no serial correlation. If the model's residual is white noise then m_1 should be negative and statistically significant while m_2 is statistically insignificant. The test of over-identifying restrictions is the Hansen J test for over-identifying restrictions described in Hansen (1982).

Table 3 Excess turnover and its non-linear impact

Variables	Model 1	Model 2	Model 3
Excess employee turnover	0.0202		
	(0.175)		
Excess employee turnover (squared)	-0.104		
	(0.421)		
Excess employee turnover (cubic)	0.0716		
	(0.292)		
Excess employee turnover lagged		-0.230	
		(0.253)	
Excess employee turnover lagged (squared)		0.552	
		(0.588)	
Excess employee turnover lagged (cubic)		-0.377	
		(0.367)	
Excess employee turnover 2-year sum			-0.137
			(0.158)
Excess employee turnover 2-year sum (squared)			0.159
			(0.175)
Excess employee turnover 2-year sum (cubic)			-0.0535
			(0.0541)
Observations	292	292	292
Number of ID	73	73	73
Serial Correlation Tests			
m_1	-4.55***	-4.52***	-4.57***
m	-0.11	-0.06	-0.15
Over-identification Tests			
Hansen (df)	$\chi^2(44)=39.61$	$\chi^2(36)=29.52$	$\chi^2(36)=38.14$

NOTE: Parameter estimates appear first and robust standard errors appear in parentheses. * indicates statistical significance at the 10% level. ** indicates statistical significance at the 5% level. *** indicates statistical significance at the 1% level. All equations control for: human capital& capacity, leadership, emplo (log), gender, age, a lagged performance variable and annual dummy variables.

8 Appendix

Table 4 EFA results

Final construct and underlying items for human capital and capacity (Cronbach's alpha:0.95)				
Building human capital				
My work unit is able to recruit people with the right skills.				
Awards in my work unit depend on how well employees perform their jobs.				
Promotions in my work unit are based on merit.	0.9381			
Retaining high performing human capital				
Pay raises depend on how well employees perform their jobs.	0.8417			
In my work unit, steps are taken to deal with a poor performer who cannot or will not improve.				
Maintaining adequate human capacity				
My training needs are assessed.	0.7380			
The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals.	0.8588			

NOTE: All items load on the same factor. Standard methods of performing factor analysis (i.e., those based on a matrix of Pearson's correlations) assume the variables are continuous and follow a multivariate normal distribution. Our model however includes variables that are ordinal, we thus employed a factor analysis using a polychoric correlation matrix.

ⁱ The term excess employee turnover comes from the fact that employee turnover due to employee replacement occurs in excess of the employee turnover that would be necessary due to a decline or an increase in employment size (Murmann 2015).

[&]quot; For more information on the survey, see: http://www.fedview.opm.gov/

ⁱⁱⁱ Available at: www.fedscope.opm.gov).

^{iv} The Cronbach's alpha for these items equals 0.9496, indicating a strong degree of reliability. When included in a factor analysis (using a polychoric matrix in order to account for the ordinal nature of the included items), all items load strongly onto one factor, explaining 62% of the variance.

^v See Grinza (2014) for a detailed discussion of the advantages of System-GMM in the context of excess employee turnover and performance. For more information on the System-GMM model in general, see Roodman (2009).

^{vi} Note that excess employee turnover is measured between April $(year_{t-1})$ and March $(year_t)$ while organizational performance is measured in April $(year_t)$. The lagged version of excess employee turnover refers to time period April $(year_{t-2})$ and March $(year_{t-1})$ while organizational performance is still measured in April $(year_t)$.