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Workload and teacher absence

Ben Ost[a,*], Jeffrey C. Schiman[b]

[a] Department of Economics, University of Illinois at Chicago, USA
[b] Department of Finance and Economics, Georgia Southern University, USA

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ABSTRACT

We investigate the determinants of teacher absences both within and across schools. We find that teachers generally respond to increased workload by decreasing their rate of absence. Teachers are less likely to be absent when they are teaching larger classes, have new grade assignments or have fewer years of experience. Moreover, we show that when teachers change schools, their absence rate quickly gravitates towards the mean absence rate of their new school, suggesting that school-level factors are an important determinant of absence rates. Finally, we show that the inverse relationship between workload and absence may lead researchers to underestimate the ceteris paribus effect of certain teacher inputs. We illustrate this point in the context of estimating the effect of teacher experience on test scores and show that controlling for absence rates increases the estimated returns to experience by approximately 10%.

1. Introduction

Although there is a large qualitative literature exploring how working conditions affect teachers' attitudes and self-reported effort (Blase, 1982; Neves de Jesus & Lens, 2005; Reyes & Imber, 1992; Timperley & Robinson, 2000), there is little research relating measurable teacher effort behaviors to their workload. Theoretically, teachers may increase effort when workloads increase, or they may become discouraged and decrease effort. Distinguishing between these possibilities is difficult, largely because few datasets include measures of either teacher effort or workload. In this article, we construct teacher-specific measures of workload to study the extent to which school- and individual-level factors influence teacher absence. We view teacher absences as a proxy for effort, but since we lack direct data on actual effort, the most conservative interpretation of our results is that they document the effect of workload on absences. Although many absences are taken for reasons such as illness, our results strongly suggest that some absences are discretionary.[1]

Using administrative longitudinal data on elementary teachers in North Carolina, we find that teachers are less likely to be absent when they teach larger classes, when they have less experience, and when they are assigned to teach a different grade from the previous year.[2] The result that teacher absences decrease following grade switches is based on a model that controls for teacher

* Corresponding author.
E-mail addresses: bost@uic.edu (B. Ost), jschiman@georgiasouthern.edu (J.C. Schiman).

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[1] Taking discretionary absences may proxy for low teacher effort, but it could also be correlated with high teacher effort. In particular, it is possible that teachers who put in little effort each day rarely take absences because they are not in need of a break. We cannot rule out this possibility, though we view it as less likely since dedication has been shown to be negatively correlated with absences in other contexts (Gaziel, 2004).

[2] The absences/experience profile has been previously documented in Clotfelter et al. (2009), Miller et al. (2008) and Hansen (2009). The relationship between class size and absences and grade switching and absences are both novel results. Although the absences/experience profile is interesting, the fact that absences rise with experience could be attributable to many different factors and is not necessarily evidence of a workload/absences relationship. For example, teachers may develop relationships with administrators and gain political capital as they gain experience that allows them to take more leave.

experience, so it suggests that teachers who have recently taught their current grade assignment are more likely to be absent than other teachers who have the same level of experience. These results are based on models that include teacher and school fixed effects, so fixed differences across teachers or schools cannot explain the findings.

Before showing the relationship between workload and absences, we first document several interesting patterns that generally suggest that teacher absences are malleable. For example, we show that among teachers who switch schools, teachers' absence rates gravitate to the average rate of absence in their new school. The timing of the change in absence rates coincides perfectly with the movement across schools and there is no evidence of differential trends prior to the school switch. We view this as evidence that school-specific factors play a role in determining absences.

We are unaware of any study that demonstrates the effect of workload on absences, but several studies document the effect of teacher absences on student learning and how absence behavior varies with teacher incentives. For instance, Herrmann and Rockoff (2012) find that teacher absences have negative effects on student performance. Similarly, Clotfelter, Ladd, and Vigdor (2009) find that teacher absences hurt student performance and that teachers are much less likely to take absences when there is a direct financial penalty for doing so. Jacob (2013) finds that teachers take fewer absences following a policy that reduced job security for teachers in Chicago. Finally, in the developing context, there are several randomized experiments that demonstrate that policies that reduce teacher absences increase test scores (Banerjee & Duflo, 2006; Duflo, Hanna, & Ryan, 2012). In addition to the consequences for student performance, Joseph, Waymack, and Zielaski (2014) estimate that teacher absences impose direct financial costs on districts of $1800 per teacher per year.

In addition to providing a better understanding of how teachers allocate effort, this study illustrates a theoretical point noted in Todd and Wolpin (2003) regarding dynamic optimization of inputs in an education production function. In their model, when one input changes exogenously, other inputs either increase or decrease depending on whether they are complements or substitutes in production. Importantly, dynamic optimization implies that the total effect of an input may differ from the ceteris paribus effect of an input. We explore empirically whether there is a difference between the ceteris paribus returns to experience and the total returns to experience. Since we show that teachers are more likely to be absent as they gain experience, past work estimating the returns to experience includes the effect of absences in their estimates of the experience profile (Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004). Researchers are often interested in the total experience effect, including the effect operating through increased absences. However, researchers are also interested in understanding the ceteris paribus effect of experience to identify the educational production function itself.[3] We show that in practice, controlling for the rate of absence increases the estimated returns to experience by approximately 10%.

2. Data and institutional environment

Our data come from the North Carolina Education Research Data Center and contain information on every public school teacher and student in North Carolina from 1995 to 2007. Our focus is on elementary teachers in PK-5. For teachers, we learn years of past teaching experience, whether or not the teacher was just reassigned to teach a new grade, the size of their primary class, and teacher demographics like race, education, and Praxis test score. The Praxis exam is a required test administered to teachers that aims to assess subject and pedagogical skills. We focus on elementary teachers because grade switching is most well defined in the elementary context where teachers generally teach a single grade. We measure absences based on the number of sick or personal days taken during the course of the academic year, as opposed to including absences taken for reasons such as school sanctioned professional development. We trim the top 1% of absences to ensure that outliers do not unduly influence results, but in practice, our estimates are very similar without dropping outliers.

In North Carolina, absence policies are set by law at the state level and specify the maximum number of sick and personal days that teachers are allowed to take.[4] Teachers are allowed to take 10 unpenalized sick days per year and 2 personal days per year (accrued on a monthly basis). If a teacher exhausts her unpenalized absences, she can take up to 20 additional days of extended sick time at a cost of $50 per day.[5] Important for our research, unused days can be carried forward across years with no limit. As such, for teachers who do not take all allotted sick and personal days each year, the number of days that they have available rises with experience. Although this suggests that teachers with many years of experience likely have more allowed absences than teachers with few years of experience, the policy does not actually generate a mechanical relationship between experience and absences. If a teacher takes all allowed absences every year, she will have the same number of absences available in her later years compared to her first year. If a teacher is unconstrained by the absence policy in her first year, this teacher is likely to be unconstrained in future years, and so the higher maximum absences will not necessarily result in more absences taken.

The first column of Table 1 shows characteristics for the sample used to study how workload relates to absence behavior. In the second column, we show these same characteristics for a sample of teachers who switch schools

[3] There are likely other endogenous inputs related to experience, so our approach does not capture a true ceteris paribus effect. We simply show how the estimated returns differ when holding fixed one of the endogenous inputs, namely teacher absences.

[4] In addition to sick and personal days, teachers are granted vacation days, but these cannot be taken while students are present. Furthermore, in our data, we cannot distinguish between vacation days and school holidays and so we focus on just sick and personal days. Results are very similar when we include vacation days in the analysis as well.

[5] Longer leaves such as maternity leave are governed by a separate set of rules.