

Teacher Attrition and the Business Cycle

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Abstract

Using national survey data and administrative data from two states—Missouri and North Carolina—we explore the relationship between the business cycle and attrition among public school teachers in the United States. We show that teacher attrition is modestly procyclical using national data, and inconsistently related to the business cycle across time and place in the two states. These findings for teachers are at odds with strong evidence of procyclical job mobility in the larger labor market. We discuss two features of the teacher labor market that may dull the responsiveness of teacher attrition to the business cycle.

Keywords

teacher attrition, teacher labor markets, education policy, teachers and the business cycle

It is a well-established finding in the economics literature that worker flows between jobs, within and across occupations, are procyclical (Bjelland et al., 2011; Hyatt & McEntarfer, 2012; Moscarini & Thomsson, 2007). That is, when the economy is growing, workers change jobs more often, and when it tightens, they change jobs less often (even inclusive of increases in involuntary separations during recessions). This is because broad economic conditions are indicative of the quality of the outside opportunities that prospective job switchers face. When the economy is booming, more promising outside options are available; when it is contracting, workers have difficulty finding better opportunities and are more likely to hunker down in place.

In this research note, we consider whether the fluctuations in worker mobility across the business cycle observed in other industries extend to attrition patterns of public school teachers.¹ On the one hand, incumbent teachers should be subject to the same broad forces as other workers during the business cycle. This gives reason to expect their job-mobility patterns—inclusive of attrition—to be procyclical. However, on the other hand, aspects of the teaching profession may dull fluctuations in worker churning compared with other professions. Two in particular stand out. First, typical teacher preparation requires a substantial up-front investment in teaching-specific human capital that is not easily transferable to other fields (Sass, 2015). This up-front investment should make incumbent teachers less responsive to the business cycle than workers with more general training, all else equal.² Second, teacher compensation in all but a few states is heavily backloaded through teacher pension plans (Costrell & Podgursky, 2009), making it more costly for teachers to exit mid-to-late-career compared with most other workers.

Teacher attrition has been a topic of great interest among education researchers and policy makers for decades. Patterns of teacher attrition can have important implications for workforce management and quality (e.g., see Adnot et al., 2017; Baker & Smith, 1997), and much work has been done to understand the factors associated with entering and leaving the profession (e.g., see Margolis, 2008; Tamir, 2013). High attrition rates in high-poverty and urban schools in particular have also received considerable attention in equity-focused research (e.g., Grissom, 2011; Papay et al., 2017; Simon & Johnson, 2015). However, we have a limited understanding about how teacher attrition fluctuates with the business cycle.

To fill this gap, we document the relationship between teacher attrition and the business cycle following on related studies of the full workforce by Bjelland et al. (2011), Hyatt and McEntarfer (2012), and Moscarini and Thomsson (2007). At the national level, we use data from the Schools and Staffing Survey (SASS) and Teacher Follow-Up Survey (TFS). These data are valuable for their breadth but limited because measures of teacher attrition can only be constructed every four to six years. We complement the national data with rich administrative data from two states: Missouri and North Carolina. Although the state data sets are narrower in geographic scope, the data are much richer and allow us to provide clearer and more detailed evidence on the link between the business cycle and teacher attrition.³

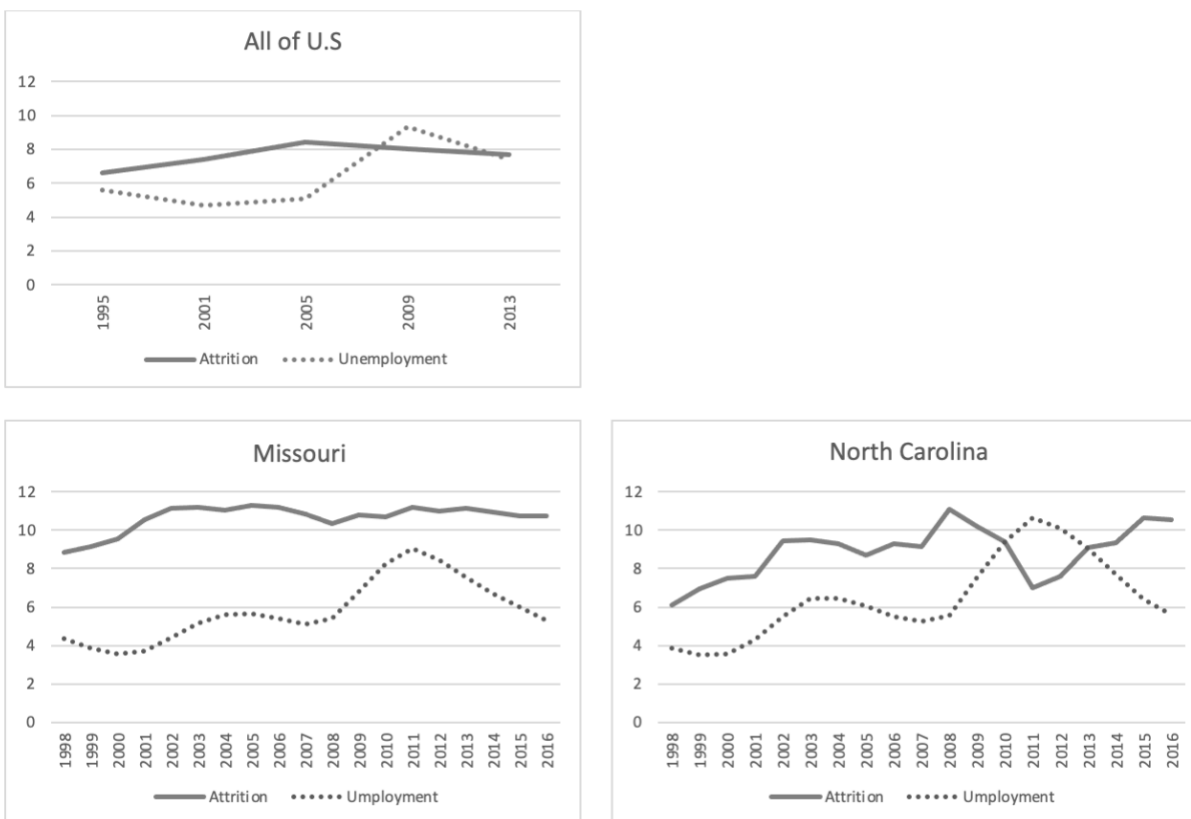
Denoting school years by the spring year (e.g., 1997–98 as 1998), our state data panels allow us to track teacher attrition annually from 1996 to 2016 in each state. This period spans several large fluctuations in economic conditions. It starts with the boom period during the mid-to late 1990s, covers the short recession induced by the dot-com bust in the early 2000s and subsequent boom leading into the Great Recession, then the Great Recession itself, and, finally, the steady post-recession recovery in the 2010s.

Following Sorensen and Ladd (2020), we report the attrition rate in each year as a three-year moving average of the immediate and two preceding years. Because we use three-year moving averages, the first year for which we report an attrition rate is 1998, which is the average of 1996, 1997, and 1998. National data from the SASS/TFS are not available annually, and thus we cannot calculate moving averages at the national level. Instead, we report SASS/TFS snapshot attrition rates for years that match the state data panels as closely as possible: 1995, 2001, 2005, 2009, and 2013 (2013 is the most recent year of TFS data collection). We focus primarily on the relationship between the business cycle and teacher attrition, where we define attrition as departure either from the profession or from the state's public school workforce. If we use a broader definition of turnover that includes cross-school teacher moves, our findings are similar, albeit at higher levels of total turnover (which can be seen by comparing Figure 1 to Appendix).

Figure 1 illustrates our main findings. We plot teacher attrition at the national level against the national unemployment rate in Panel A, attrition in Missouri against the Missouri unemployment rate in Panel B, and attrition in North Carolina against the North Carolina unemployment rate in Panel C. In Panel A, we plot snapshots

of the national unemployment rate for the same years as the SASS/TFS surveys. In Panels B and C, the unemployment rates are three-year moving averages to match the construction of the state-level teacher attrition rates. A rising unemployment rate is an indicator of economic contraction, and a falling unemployment rate is an indicator of economic expansion. Given this, if teacher attrition is procyclical, we would expect it to rise when the unemployment rate is falling, and to fall when the unemployment rate is rising.

Figure 1. Teacher Attrition and Unemployment Rates



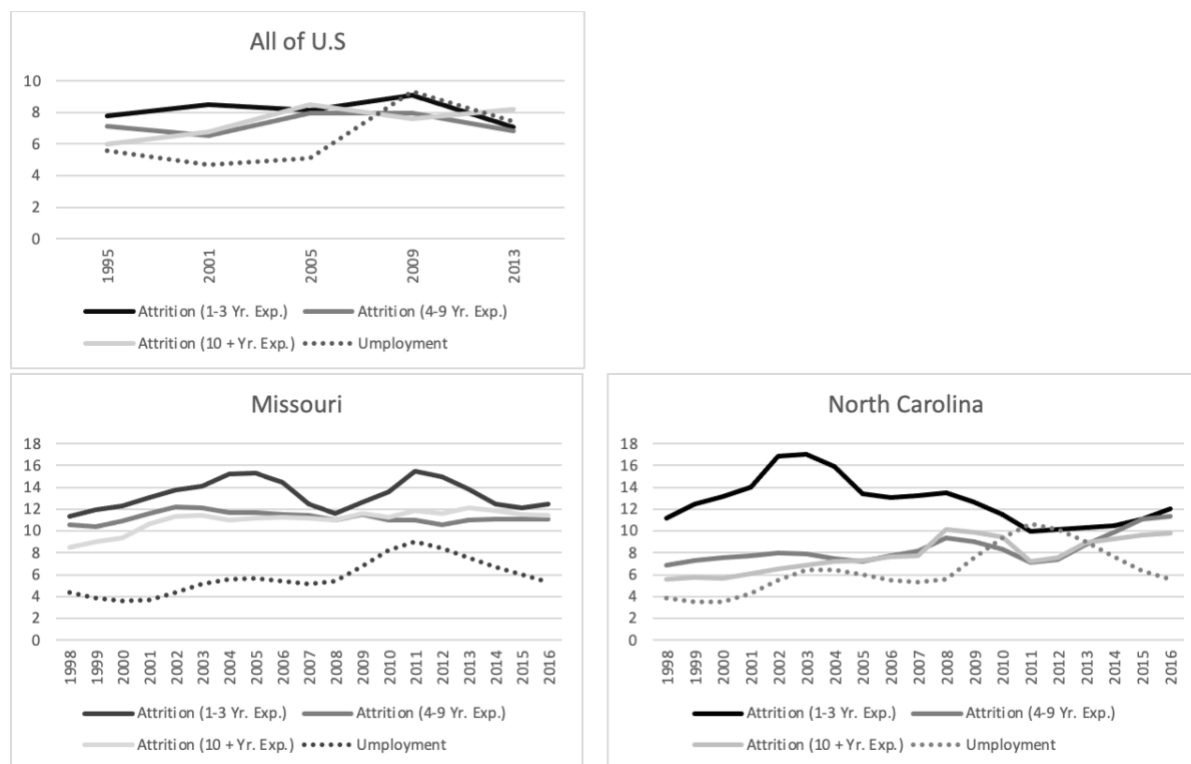
Note. A rising unemployment rate signifies a declining economy. Therefore, a positive relationship between the unemployment rate and the teacher attrition rate signifies that attrition is countercyclical, while a negative relationship between them signifies that attrition is procyclical.

The national trends in Panel A covary negatively, which suggests that teacher attrition is broadly procyclical in the United States. However, strong inference is not possible because of the limited number of data points. It is also noteworthy that the fluctuations in teacher attrition in the national data are modest, especially since the turn of the century. From 2001 to 2013, the attrition rate fluctuated within just a single percentage point (7.4% to 8.4%). In contrast, the patterns in the two states were mixed. In Missouri, the attrition trend was countercyclical in the early 2000s, after which it flattened out and gave no visual indication of a relationship with the business cycle. In North Carolina, the attrition trend was countercyclical before 2005, but a strong procyclical trend emerged thereafter.

In Figure 2, we split out teacher attrition rates by experience. The figure shows that over the time span of our study, early-career teachers had generally higher attrition rates compared with their more experienced peers.⁴ The attrition rate trends for inexperienced teachers were also more volatile, which is especially apparent in the data from the two states. An intuitive explanation for these differences is that inexperienced teachers are more weakly connected to the profession and more sensitive to many factors in their retention decisions. However, Figure 2 does not indicate that inexperienced teachers were more responsive than other teachers to the business cycle in the direction that would be

expected based on evidence from the larger labor market. In fact, in Missouri, the co-movement between the attrition rate among inexperienced teachers and business cycle appears to be strongly *countercyclical*.

Figure 2. Teacher Attrition by Teaching Experience and Unemployment Rates



Note. A rising unemployment rate signifies a declining economy. Therefore, a positive relationship between the unemployment rate and the teacher attrition rate signifies that attrition is countercyclical, while a negative relationship between them signifies that attrition is procyclical.

One factor that could contribute to the countercyclical trend for inexperienced teachers in Missouri is forced separations—for example, recession-induced layoffs, which would show up in our data as countercyclical attrition. However, layoffs cannot fully explain the countercyclical trend because inexperienced teachers in Missouri also had declining attrition during periods of economic expansion. Still, more broadly, it is possible that demand-side factors, such as layoffs during economic contractions, could put countercyclical pressure on all the attrition trends we estimate, which in turn would contribute to our finding that teacher attrition is not as procyclical as evidence from the larger workforce would suggest. Fortunately, we can rule this out as a driver of our general findings because experienced teachers are virtually exempt from layoffs in practice (Goldhaber et al., 2016), and the relationships between the business cycle and teacher attrition for experienced teachers are similar to the overall relationships in Figure 1.

We draw two primary conclusions from our analysis. First, the relationship between teacher attrition and the business cycle is inconsistent across time and place.⁵ This result is surprising given the clear evidence of procyclical job mobility documented for the larger workforce in the economics literature. Second, the magnitudes of attrition rate fluctuations among teachers are generally not large even though our data span a period marked by substantial swings in the business cycle. For example, even in North Carolina, where the fluctuations have been largest, the total attrition rate since the turn of the century has remained within a band of about 3 percentage points. In Missouri, fluctuations in the attrition rate have been even smaller. Taken on the whole, our findings suggest that incumbent teachers are not highly (or consistently) responsive to the business cycle in the same ways that have been documented for the larger labor market. As noted earlier, we hypothesize that this could be due to job-specific human capital requirements and/or the backloaded compensation structure in teaching.

We also note two limitations of our analysis. First, we focused on attrition patterns among incumbent teachers and are silent about the teacher pipeline. Recent complementary evidence on the teacher pipeline is available from Blom et al. (2021), who showed that the share of students who choose early and elementary education majors is strongly procyclical. Combining their findings with ours provides a more holistic view of how teacher labor supply moves with the business cycle, inclusive of incumbents and new entrants.⁶

The other limitation is that we did not attempt to isolate the causal impacts of the business cycle on teacher attrition. Therefore, we cannot rule out the possibility that factors correlated with the business cycle, and/or contextual factors in Missouri and North Carolina, have contributed to our findings. That said, we share this caveat with the aforementioned studies in the economics literature (e.g., Bjelland et al., 2011; Hyatt & McEntarfer, 2012; Moscarini & Thomsson, 2007), and it is noteworthy that in these other studies, job-mobility patterns for the larger workforce move quite clearly with the business cycle. An instructive example is Hyatt and McEntarfer (2012), who tracked job mobility in multiple U.S. states from 1998 to 2010, a period subsumed by our analysis. These authors found a very strong procyclical pattern of job mobility, especially during the Great Recession, which we did not replicate with our data on teacher attrition. One interpretation is that the business cycle is a dominant driver of job mobility in the larger labor market, but not in teaching.

Acknowledging these caveats, we provide new, teacher-specific evidence on the relationship between job mobility and the business cycle. We show that teacher attrition is not as strongly or consistently tied to the business cycle as one might expect based on economy-wide evidence on job mobility. Our inconsistent findings across time and place exemplify the localized nature of state teacher labor markets and have implications for efforts to forecast labor market conditions—the importance of which is discussed in Baker and Smith (1997)—at the state level. It is also reasonable to hypothesize that analyses conducted at an even more localized level (e.g., metropolitan statistical areas, counties, or even districts) could provide deeper insights (also see Di Carlo, 2015).

Finally, our findings point to the value of future research to (a) provide more comprehensive evidence on state-level heterogeneity in the relationship between teacher attrition and the business cycle and (b) unpack the factors that drive differences in patterns of teacher attrition across time and place. With regard to the former, our inconsistent findings in Missouri and North Carolina raise a larger question about the extent to which business cycle fluctuations in teacher attrition (or a lack thereof) vary in other states. With regard to the latter, understanding why differences exist across states can improve our understanding of how educator labor markets operate. A notable contemporary example is the COVID-19 pandemic, which has escalated concerns about increases in turnover and looming teacher shortages (Barnum, 2021; Zamorro et al., 2021). Identifying changes in teacher attrition that result directly from pandemic-related factors, as opposed to broader macroeconomic or demographic trends, could allow for more carefully targeted policy interventions.

Notes

1. Our focus on attrition necessarily implies a focus on incumbent teachers. See Blom et al. (2021) and Nagler et al. (2020) for related evidence on the relationship between the business cycle and the teacher pipeline.
2. There are two reasons for this: (a) The investment is endogenous, with the implication being that those who choose to make it are more likely to be attached to the teaching field, and (b) the relatively low rate of transferability of teaching-specific human capital will reduce the value of outside opportunities during periods of economic growth.
3. Missouri and North Carolina are a convenience sample of states made possible by the authors' long-standing research programs in these states. See the appendix for brief additional details about the data.
4. In some periods, the attrition-rate gaps by experience are small or even modestly reversed. We note the narrowing of the attrition-rate gaps by experience over time in all three data sets as a surprising incidental finding. Using national data, the narrowing gaps have been previously documented by Di Carlo (2015).
5. Recent findings from Goldhaber and Theobald (2021) provide further support for this conclusion. These authors conducted an investigation similar to our own in Washington State. Correspondence with these authors

indicated that they found a strong procyclical relationship between teacher attrition and the business cycle—in contrast to our findings in Missouri and North Carolina—during the same period covered by our study.

6. Blom et al. (2021) noted that their findings with respect to education majors are counterintuitive given the attributes of education majors (namely, the concentration of occupational options associated with the degree) and the broad labor market dynamics of the business cycle. It is beyond the scope of our research note to flesh this out in detail, but it is notable that Blom et al. (2021) also identified an aspect of the teacher labor market that deviates from expectations.

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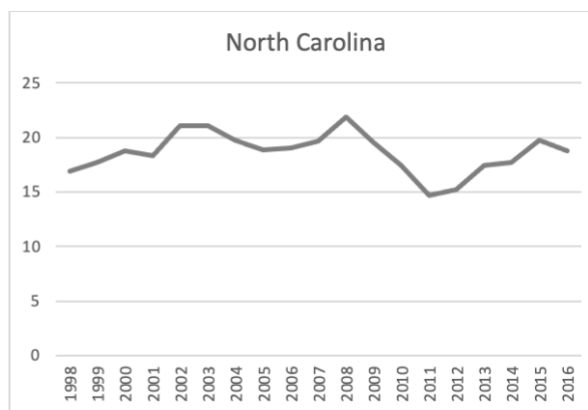
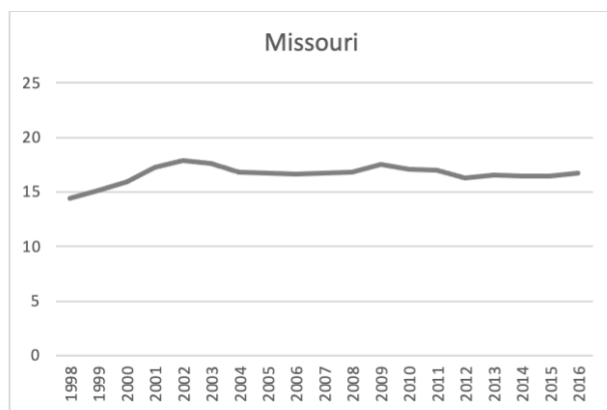
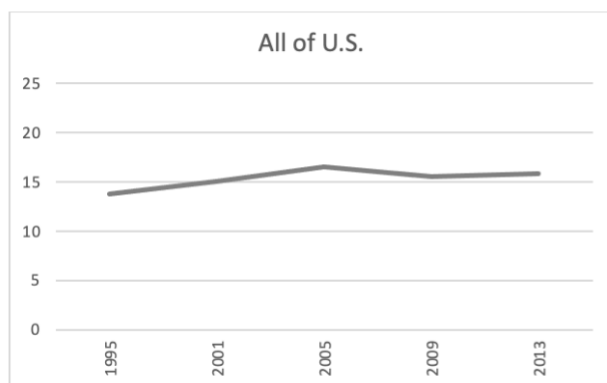
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APPENDIX

Teacher School-Exit Rates



DATA APPENDIX

Our analysis relies on several data sources to document the link between the business cycle and teacher attrition. The data on teachers in Missouri and North Carolina are from statewide administrative data sets covering K–12 public school teachers in these states between 1996 and 2016. Our calculations use data from all individuals working at least 75% time in a teaching position. An exit is coded to have occurred whenever a teacher in year t is not observed in a public school in the same state in year $t+1$. This definition includes “stopouts” (for instance, when a teacher

leaves for one year and then returns the following year), but this should not affect the general trends reported in the main text.

The national teacher attrition rate trend is calculated using data from waves of the Schools and Staffing Survey (SASS) and Teacher Follow-Up Survey (TFS), made available by the National Center for Education Statistics.

The state and national unemployment rate trends are as reported by the U.S. Bureau of Labor Statistics.

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