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Evidence of the Unintended Labor Scheduling Implications of the Minimum Wage

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The effect of the minimum wage has been an important topic of debate for decades. For many years, low-wage laborers, especially in the food service and retail sectors in the United States, have been advocating an increase in the minimum wage to \$15. Intending to increase worker welfare, many states (e.g., California and New York) and municipalities (San Francisco, Seattle, and New York City) have responded by raising their minimum wages.

There are concerns that an increase in the minimum wage may have negative consequences, including job losses. The findings that appear to support these concerns, however, are not conclusive: some studies show that the minimum wage has a small but negative employment effect, while others show no such adverse employment effect. This debate has continued to the present. Part of what makes the employment

effect so elusive is that, besides employment, firms may strategically respond to the minimum wage through job attributes other than wages, such as worker schedules. This is often not considered but can have significant implications on worker welfare. Despite its theoretical importance, no empirical evidence has been established yet on the scheduling implications of the minimum wage. This is partly due to the fact that detailed scheduling data (that capture the precise daily shifts worked by all employees within the same firms) are not publicly available and are hard to obtain.

In our research, we take the first step to study how firms respond to a minimum wage in their labor scheduling practice by leveraging a highly granular data set of worker schedules from a medium-sized chain of fashion retail stores in the United States. Specifically, we study worker scheduling and minimum wage data from 2015 to 2018 for 5,832 workers at



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47 stores in California and 17 stores in Texas. All stores share the same brand. Our data include all workers employed at the stores. They are all paid by the hour, and most of them are paid the minimum wage. The key advantage of our data set is that it allows precise measurements of labor hours for a store as a whole and for all individual workers within a store, including the timings of the shifts for each worker.

We consider the stores in Texas—where the minimum wage of \$7.25 did not change during our study period—as the control group, and we consider the stores in California—where the minimum wage was constant in 2015 and has increased every year thereafter—as the treatment group.

Our results show that the minimum wage has a negligible impact on the total labor hours employed at the stores, which is consistent with the literature on the employment effect of minimum wage, especially in the nontradable sectors (e.g., retail and service). However, we show that the way in which the stores allocate these hours among their workers does change. Specifically, when the minimum wage increases by \$1, the number of workers scheduled to work each week goes up by 27.7 percent, while the average hours per worker per week decrease by 19.4 percent. For an average store in California, for example, these changes translate into four extra workers per week and five fewer hours per worker per week. This means, for an average worker in California paid the minimum wage, that her total wage compensation is reduced by 13.6 percent when increasing the minimum wage from \$11 to \$12.

This decrease in the average number of hours worked not only reduces total wages but also impacts workers' eligibility for benefits. We show that the percentage of workers with more than 20 weekly hours (who may be eligible for retirement benefits, according to the Employee Retirement Income Security Act of 1974) and those with more than 30 weekly hours (who may be eligible for health care insurance, according to the Affordable Care Act) decreases by 21.5 percent and 15.3 percent, respectively. These results suggest that as the minimum wage increases, firms may strategically adjust their scheduling practices to reduce the number of workers who are eligible for benefits. This is consistent with results from previous research on survey data that show that a minimum wage increase reduces workers' likelihood to receive health care insurance, especially in the low-wage sectors.

Besides the direct reduction in total wage compensation and eligibility for benefits, we also show that increasing the minimum wage leads to less-consistent worker schedules in terms of both the number of hours they work from one week to another and the timing of their shifts. In particular, for each \$1 increase in the minimum wage, the absolute deviation in the number of weekly hours worked by each worker increases by up to 32.9 percent. In addition, we show that the absolute deviation in the number of daily hours increases by up to 9.7 percent. When exploring the effects across different workers, we find that the deterioration of scheduling consistency is generally more severe for workers with a shorter tenure.

The practices of limited and inconsistent hours have already been extremely prevalent, especially in the service and retail sectors and among low-wage workers. Recent studies have found that in 2015, 6.4 million workers—4.4 percent of the entire national labor force—were working part time even though they would have preferred to work full time and that 17 percent of the U.S. workforce has inconsistent work schedules. Previous research shows that limited and inconsistent worker schedules can make it significantly harder for workers to coordinate job activities with their personal lives, to have a second job, or to attain financial stability. These issues could be exacerbated through further minimum wage increases and thus underscore the need to better understand the scheduling implications of the minimum wage.

We further show that increasing the minimum wage can diminish worker welfare due to the changes in firms' scheduling practices, even when it does not reduce the overall employment. For an average worker in a California store in our data, we estimate the net loss of welfare due to their reduction of hours, lower eligibility for benefits, and less-consistent schedules (that resulted from a \$1 increase in the minimum wage) to be at least \$1,599 annually, or 11.6 percent of the worker's total wage compensation. This is assuming that workers were able to use their reduced hours to work a second job—an assumption that may not hold true for many workers.

Our study is the first to empirically examine the labor scheduling implications of the minimum wage. The granularity of our data allows us to precisely characterize the scheduling practice of each retail store and cleanly identify

how stores' scheduling practices and workers' schedules change with the minimum wage. The economic literature generally assumes that the welfare effect of a minimum wage increase is positive if it does not reduce employment. However, our results show that stores' strategic adjustments in their labor scheduling practices (as a result of the minimum wage increase) can substantially reduce worker welfare, even when the overall employment at the stores is unchanged. These results highlight the importance of this infrequently considered operational mechanism through which increasing the minimum wage may impact worker welfare. As such, to better design minimum wage policies

that truly benefit workers, it is essential for policymakers to better understand the operational tradeoffs that firms face in their scheduling decisions (in the presence of demand and capacity uncertainties). Our study sheds light on this critical issue.

NOTE

This research brief is based on Qiuping Yu, Shawn Mankad, and Masha Shunko, "Evidence of the Unintended Labor Scheduling Implications of the Minimum Wage," *Manufacturing & Service Operations Management* (forthcoming).