Minimum Wage Policy and Daily Time Allocation: Evidence from the American Time Use Survey

1. Introduction

A key question in the minimum wage literature is not only whether higher wage floors affect employment, but how workers adjust their behavior in response to changing economic constraints. Labor supply theory states that wage increases influence behavior through both substitution and income effects. The substitution effect arises because higher wages increase the opportunity cost of non-work time, encouraging individuals to substitute toward more labor supply (Borjas, 2016; Robert McClelland & Mok, 2012). However, the income effect points out that high wages could lead to higher wages and thus higher purchasing power, which may allow individuals to reduce labor supply and consume more leisure (Kimball & Shapiro, 2008). While a large body of research has examined the effects of minimum wage policies on employment and wages (Neumark & Wascher, 2006), far less is known about how these underlying mechanisms translate into changes in everyday behavior. In particular, existing work has focused on aggregate outcomes, such as employment and hours worked, without directly observing how these outcomes arise from underlying behavioral adjustments.

This paper argues that time allocation provides a unifying framework for understanding these behavioral responses. Because all individuals face a fixed time constraint, any change in wages must be reflected in how time is reallocated across activities. Outcomes such as hours worked, leisure, and childcare are therefore not independent responses, but different manifestations of a common underlying decision, which is how individuals allocate their limited time. By focusing directly on time use, this paper focuses on the behavioral mechanism that links minimum wage policy to a broad range of economic and social effects.

Drawing on this framework, I analyze how minimum wage policy is associated with changes in daily time allocation using data from the American Time Use Survey (ATUS) from 2003 to 2019 . Rather than focusing on a single activity, the analysis considers how individuals reallocate time across multiple mutually exclusive categories, including paid work, unpaid work, leisure, and other activities. This approach provides a comprehensive view of how individuals adjust their behavior within the fixed constraint of 24 hours per day.

In addition to the level of the minimum wage, the analysis incorporates multiple dimensions of policy design, including automatic indexation, state-federal differences, and the frequency of policy changes. This multidimensional approach allows the paper to distinguish between the effects of wage levels and the effects of policy structure. In particular, it provides a way to assess whether more predictable or systematically implemented policies generate different behavioral responses than more episodic changes.

The empirical strategy exploits variation in minimum wage policies across states and over time to identify how differences in policy environments are associated with differences in daily time allocation. Linking individual time-use diaries to state-year policy variation allows the analysis to capture how changes in economic constraints translate into changes in behavior at the population level.

The results reveal a consistent pattern of adjustment. Higher minimum wages are associated with reductions in time spent on paid work, indicating that individuals adjust along the intensive margin by working slightly fewer hours. In addition, changes in leisure are generally positive but with lower significance levels, suggesting that time freed from market work is not fully reallocated to discretionary activities. Most other categories of time use, including sleep and personal care, remain largely unchanged. Taken together, these findings point to systematic, though modest, reallocations of time rather than large shifts in behavior.

Heterogeneity analysis further highlights how existing constraints shape these responses. Reductions in work time are more pronounced among individuals with lower educational attainment, who are more likely to be directly affected by wage policies. By contrast, reductions in paid work among women are broadly similar to those observed in the full sample. Additionally, the decline in paid work does not consistently translate into more leisure for women, suggesting that time freed from employment may instead be absorbed by caregiving and household responsibilities.

This paper contributes to the literature by reframing minimum wage policy through the lens of time allocation. First, it provides a unified framework that links labor market changes to a broad range of behavioral outcomes by focusing on how individuals allocate time under a fixed constraint. Second, by incorporating multiple dimensions of policy design, it shows that behavioral responses depend not only on the level of the minimum wage, but also on its structure and predictability. Third, it documents a systematic pattern of time reallocation that complements existing evidence on employment and earnings and offers a more complete view of how individuals respond to policy-induced changes in economic constraints.

More broadly, the findings suggest that minimum wage policy reshapes not only labor market outcomes, but the allocation of time itself. By focusing on time use as the underlying behavioral mechanism, this paper highlights an adjustment margin that connects a wide range of downstream outcomes and has received comparatively limited attention in the literature.

2. Literature review

2.1 Minimum Wage Policies

Minimum wage policies have been introduced for different reasons across countries and historical periods, but they share a common function of setting a lower bound on wages for low-paid workers and have become a key focus in labor economics (Neumark & Wascher, 2008).

In the United States, differences in minimum wage levels across states and over time, arising from the interaction of federal and state policies, have provided a useful setting for causal analysis using quasi-experimental methods. For example, Dube et al. (2010) use differences in minimum wage policies across contiguous counties on either side of state borders to estimate the causal effect of minimum wage increases on employment. Another example is Cengiz et al. (2019) using variation in minimum wage changes across states and over time to examine how wage floors affect the distribution of low-wage jobs.

The earliest efforts date back to the 1910s at the state level, with Massachusetts among the pioneers (Massachusetts. Commission on Minimum Wage Boards, 1912), motivated by concerns about shielding vulnerable workers, particularly women, children, and immigrants, from exploitative employment and pay. However, many of these initial laws were invalidated by the Supreme Court, and a later attempt under the National Industrial Recovery Act was also ruled unconstitutional in 1933 (National Industrial Recovery Act, 1933).

In 1938, the Fair Labor Standards Act introduced the federal minimum wage in the United States, initially set at $0.25 per hour. Since then, the federal minimum wage has been amended multiple times. However, the current federal minimum wage has remained at $7.25 for more than a decade since 2009 (Washington State Department of Labor & Industries, n.d.). There are eight states that either have no minimum-wage law or have a minimum wage below the federal minimum wage, and thus, the federal minimum wage applies in all of these states (National Conference of State Legislatures, 2025). Many states and cities have implemented their own minimum wages, which are usually higher. Some states index the minimum wage to inflation and adjust their policies frequently. In fact, the minimum wage is indexed for inflation in 19 states and the District of Columbia (Economic Policy Institute, n.d.).

Due to state-level policies, there are material differences among states. For example, Washington State has increased its minimum wage annually since 1999, and in 2025 it stands at $16.66 (Washington State Department of Labor & Industries, n.d.). By contrast, states like West Virginia have not changed their minimum wage in years. The last minimum wage raise in West Virginia was in 2016, with the state-level minimum wage remaining at $8.75 since then (U.S. Department of Labor, 2026)). Overall, a highly localized state-level adjustment approach to minimum wage policies has resulted in substantial policy variation over time, which provides the empirical basis for identifying policy effects.

Early theoretical models predicted that minimum wages would reduce employment by increasing labor costs (Partridge & Partridge, 1999). However, more recent empirical evidence has challenged this view. The modern “new minimum wage literature” finds that the employment effects of moderate increases are generally small, close to zero, or context-dependent (Dube & Lindner, 2024; Hurst et al., 2022). While some studies continue to identify negative impacts for specific subgroups, such as less experienced workers, the overall consensus has shifted away from large disemployment effects (Neumark & Shirley, 2021).

In addition to employment, researchers have examined impacts on hours worked. Evidence on this intensive margin remains mixed. Some studies, such as the Seattle case study (Jardim et al., 2022) finds reductions in hours among low-wage workers, while others suggest that such adjustments are modest and that total earnings still increase(Hamdi & Sovich, 2025). These findings indicate that focusing solely on employment provides an incomplete understanding of how minimum wage policies affect labor markets.

2.2 Margins of Adjustment and Economic Mechanisms

A key advancement in the literature is the recognition that minimum wage policies operate through multiple margins of adjustment, rather than solely through employment changes. Firms may respond to higher wage floors by adjusting prices, productivity, workforce composition, or non-wage benefits. These adjustments allow firms to absorb increased labor costs without necessarily reducing employment (Dube, 2019; Manning, 2021).

For example, firms often pass part of the cost increase onto consumers through higher prices, while also adapting production processes or reallocating labor across tasks. At the same time, minimum wages can compress wage distributions and reduce inequality (Autor et al., 2016; Dube, 2019).

Importantly, these adjustments shape how workers experience policy changes. Increases in wages, combined with potential changes in hours worked or job conditions, alter individuals' income and economic incentives. These changes form the key mechanisms through which minimum wage policies influence behavior beyond the labor market.

Work hours are shaped by both individual preferences and employers' constraints, making this an area where results remain inconclusive. Much of the US-based research focuses on case studies, which provide insight into specific policy changes but often lack generalizability (Schmitt, 2015). For example, as one of the more worker-friendly cities with progressive labor policies, Seattle has implemented a city-level minimum wage policy since 2015 and has one of the highest minimum wages in the US at $20.76 per hour. A case study of Seattle found that employers responded to the minimum wage increase by reducing hours per worker in the short run and that less experienced workers experienced reduced hours compared to more experienced workers (Jardim et al., 2022).

Recent reviews emphasize that hours adjustments tend to be modest, and that total labor income often still increases despite small reductions in hours. This highlights the importance of examining how individuals reallocate time across activities rather than focusing solely on employment status.

2.3 Downstream Effects of Minimum Wage Policies

A growing literature examines the downstream effects of minimum wage policies on outcomes such as health, education, and household behavior. These effects operate through changes in income and shifts in household decision-making (Dube & Lindner, 2024).

For example, higher household income may ease financial constraints and support greater investment in education, particularly for younger individuals, although the effects can be ambiguous due to changes in the opportunity cost of schooling (Acemoglu & Pischke, 2000; Dahl & Lochner, 2012). In addition, improved labor market opportunities and reduced economic hardship may lower incentives to engage in criminal activity, with evidence often pointing to reductions in property crime and more mixed effects on violent crime (Loonam, 2020). Minimum wage policies can shape a wide range of socioeconomic outcomes through changes in income and household decision-making, extending their impact well beyond the labor market (Dube & Lindner, 2024).

There are some downstream impacts that remain inconclusive, and empirical findings in this area are mixed. For example, by increasing earnings for low-wage workers, minimum wages can improve health outcomes through better access to healthcare and housing, as well as by reducing financial stress and improving mental well-being (Komro et al., 2016; Krieger & Higgins, 2002; Maqbool et al., 2015; Reeves et al., 2017). Another study reached a similar conclusion. Sigaud et al. (2022) use self-reported health to measure people's physical and mental health, and find that increases in minimum wage improve general health and reduce physical and mental health burdens. This also aligns with earlier literature reviewed by Amine and Mebada (2024). However, some recent studies have found the opposite. For example, Neumark (2024) reports that higher minimum wages were associated with increases in risky behaviors such as alcohol consumption, suggesting a more complex relationship between wage policies and health outcomes, and pointed out that an increase in minimum wage does not always translate into a positive effect on health.

While existing studies document important downstream effects of minimum wage policies, they typically examine these outcomes separately. These outcomes are ultimately driven by how individuals allocate their time. Because wages affect both income and the opportunity cost of time, time use provides a natural and unified framework for understanding behavioral responses to minimum wage policy.

2.4 Time Allocation and Economic Incentives

Understanding how individuals allocate their time is central to economic behavior. Becker's (1965) household production model provides the foundational framework, in which individuals maximize utility by allocating time across competing activities, such as paid work, household production, and leisure, subject to both time and budget constraints. He was the first to integrate consumption with time use in the production of the household utility, rather than treating consumption and leisure as separate entities. In this framework, the wage serves as a resource constraint that can influence how individuals allocate their time.

A key implication of this framework is that wages influence time allocation through two channels, they determine both the opportunity cost of time and total available income. An increase in wages generates two opposing forces. The substitution effect raises the opportunity cost of non-market time, incentivizing individuals to allocate more time toward paid work. In contrast, the income effect allows individuals to reduce labor supply or increase leisure if higher income

satisfies consumption needs (He et al., 2022; Kimball & Shapiro, 2008). The net effect on time allocation is therefore theoretically ambiguous and depends on individual preferences and constraints.

Empirical evidence suggests that time allocation decisions are also shaped by demographic and social factors. Gender, age, and family structure influence how individuals divide time across paid and unpaid activities (Garcia-Prieto & Gómez-Costilla, 2017; Giurge et al., 2021). Moreover, time use is closely linked to well-being, with leisure and discretionary time associated with higher levels of happiness than market or domestic work (Han & Kaiser, 2024; Hoang & Knabe, 2021). These insights highlight the importance of studying time use as a behavioral outcome that reflects underlying economic incentives.

Despite the clear theoretical link between wages and time allocation, relatively few studies have directly examined how minimum wage policies affect time use. Existing research has primarily focused on specific activities rather than the full allocation of daily time. Using the American Time Use Survey, both Gearhart et al. (2023) and Morrissey (2023) find that a higher minimum wage increases parental time spent on childcare. Gearhart et al. highlights greater effects among low-educated mothers, particularly in both primary and enriching childcare activities. Morrissey observes that higher minimum wages led to more weekend time and overall time spent with children. These effects may be due to reduced financial constraints, which allow parents to access greater flexibility in allocating their time. Although neither study clearly disentangles the exact mechanisms driving the changes in time allocation, they both point out that a higher minimum wage would lead to benefits for both parents and children. Similarly, Lenhart (2019) finds that minimum wage increases are associated with reductions in time spent on health-related activities, such as exercise, particularly among men. This finding highlights that time reallocation may involve trade-offs across different non-market activities rather than uniformly improving all dimensions of well-being.

While these studies provide important insights, they focus on specific activities in isolation and do not capture how individuals reallocate time across the full set of daily activities. In addition, the underlying mechanisms, whether driven by income effects, substitution effects, or changes in work schedules are not fully disentangled.

2.5 Research Gap and Contribution

The literature reveals three key limitations:

First, existing research on minimum wages has largely focused on employment or isolated dimensions of time use, rather than examining how individuals reallocate time across the full set of daily activities.

Second, most studies treat minimum wage policy as one-dimensional, focusing on the wage level while overlooking other important features such as indexation to inflation, frequency of adjustments, and variation between state and federal policies.

Third, there is limited integration between labor market adjustments and behavioral responses, resulting in an incomplete understanding of how policy-induced changes in income and constraints translate into observable changes in daily behavior.

This paper addresses these gaps by analyzing how minimum wage policy affects the allocation of time across multiple mutually exclusive activities. It provides a unified framework linking policy changes to behavioral responses. In addition to the effective minimum wage, the analysis incorporates alternative policy dimensions to examine how different dimensions of minimum wage policy shape individual responses.

3. Methodology

3.1 Data

The analysis draws on the American Time Use Survey (ATUS) from 2003 to 2019 (U.S. Bureau of Labor Statistics, 2019) merged with state-level minimum wage policy data constructed using the National Welfare Data set from the University of Kentucky Center for Poverty Research (UKCPR) (University of Kentucky Center for Poverty Research, 2025).

ATUS is a nationally representative repeated cross-sectional survey administered annually by the U.S. Bureau of Labor Statistics. Individuals included in the ATUS are randomly drawn from households that have just completed their participation in the Current Population Survey (CPS). Diary days in the ATUS are assigned to ensure coverage across the entire week: 10 percent are allocated to each weekday (Monday through Friday), while Saturdays and Sundays each account for 25 percent. These assignments are also spread evenly throughout the year. The interview is conducted over the phone and the interviewer guides them through a detailed account of their activities over a 24-hour period, starting at 4:00 a.m. on the designated day and ending at 3:59 a.m. the following day. Respondents describe their primary activities in their own words, with each activity recorded sequentially along with its end time. The total number of activities reported varies across respondents. This structure enables the direct observation of how individuals allocate time across daily activities, such as paid work, household production, etc., which is particularly well suited to examining differences in time allocation associated with minimum wage regulation. ATUS samples a new cross-section each year rather than following the same individuals over time. Because each respondent reports activities for only a single diary day, the analysis captures population-level differences in daily time allocation rather than within-person changes across periods.

The National Welfare Data includes state-level panel data series covering population, employment, unemployment, welfare, poverty, and politics. The dataset includes state-level and federal-level minimum wage for all states from 1980 to 2024.

The merged dataset links individuals to the policy environment in their state and survey year, creating variation across both geographic units and time. This variation allows identification of how differences in minimum wage policies correspond to differences in daily time allocation.

3.1.1 Sample Characteristics

The analytic sample is restricted to respondents aged 16-64 who are employed at the time of the survey (either part time or full time), identified using valid industry codes in the ATUS. Sampling weights provided by the ATUS are applied to ensure that the descriptive statistics are nationally representative. To mitigate the influence of extreme values, individuals reporting usual weekly working hours of 80 or more are excluded from the sample. These observations represent approximately the top 1% of the distribution[1]. This approach is consistent with standard practice in empirical research, where extreme values are commonly addressed given their potential to distort estimation. (Peña & Yohai, 2023)

Table 1 presents weighted descriptive statistics for the estimation sample. The summary statistics are broadly consistent with patterns observed in U.S. labor market data. The average age is around 40 for both men and women, and men have slightly more weekly hours worked on average, reflecting well-documented gender differences in labor supply. Women are more likely to work part-time and exhibit slightly higher educational attainment, consistent with national trends. While the share of White individuals appears higher than in the overall population, this reflects the restriction to employed individuals in the ATUS sample. Overall, the sample appears representative of the working-age employed population.

Table 1. Descriptive Statistics of the Estimation Sample (ATUS 2003–2019)

Variable	Female Average	Female Min	Female Max	Male Average	Male Min	Male Max
Age	40.7	16.0	64.0	40.3	16.0	64.0
Usual weekly hours worked	37.9	1.0	80.0	43.7	1.0	80.0
Number of children < 18 living in the household	0.8	0.0	10.0	0.8	0.0	10.0

Variable	Female (%)	Male (%)
Race: White	81.1%	84.4%
Education: > High school	68.5%	60.3%
Married	55.3%	60.7%
US-born	85.3%	81.4%
Full-time	75.5%	89.7%

Notes: Weighted using ATUS sampling weights. Sample restricted to employed individuals aged 16–64 with >0 weekly working hours. N = 108367.

3.2 Measurement and covariates

3.2.1 Minimum wage policies

This paper distinguishes between the level of the minimum wage and other features of policy design. The effective minimum wage serves as the primary policy variable, capturing the wage floor faced by workers. In addition, I constructed three supplementary measures, including automatic indexation, state–federal differences, and policy change frequency, to capture distinct dimensions of minimum wage policy design. These additional variables are not alternative

1The removal of outliers does not materially affect the main results.

measures of the same treatment, but rather reflect different institutional features of how minimum wage policy is implemented.

State-level and federal minimum wage data are drawn from the UKCPR National Welfare Data, supplemented with information from official state sources documenting the adoption of automatic indexation. Using these sources, I construct four variables to capture different aspects of minimum wage policy.

1. Effective minimum wage: the actual dollar amount in state *s* and year *t*, defined as the higher of the state or federal minimum wage. All minimum wage values are converted into constant 2003 dollars using the Consumer Price Index (CPI) (U.S. Bureau of Labor Statistics, 2026).
2. Automatic indexation: a binary indicator equal to 1 if a state indexed its minimum wage to inflation in a given year.
3. State wage above the federal level: a binary indicator equal to 1 when the state minimum wage exceeds the federal minimum wage in a given year.
4. Policy change frequency: the cumulative number of state-level minimum wage adjustments since 2003, measured for each state–year up to the survey year.

Effective minimum wage is the standard measure used in broader minimum wage research. It captures the actual price floor on low-wage labor (Neumark & Wascher, 2007). This is the primary variable of interest throughout the analysis. The effective minimum wage ranged from $5.15 to $7.15 in 2003, with a mean of $5.48. After converting values into constant 2003 dollars using CPI, the corresponding values for 2019 ranged from $5.21 to $10.05, with a mean of $6.55. The effective minimum wage by state is reported in Appendix Table A1.

Automatic indexation is intended to indicate whether a state has implemented a structural adjustment mechanism. Indexation represents a shift away from ad hoc legislative increases toward a system of regular updates tied to inflation. It reflects a regime characterized by greater predictability and sustained wage growth. This variable therefore captures the extent to which wage policy is institutionalized rather than discretionary. Between 2003 and 2019, five states adopted automatic indexation of their minimum wages: Montana in 2008, Ohio in 2007, South Dakota in 2016, Minnesota in 2018, and Vermont in 2019.

The indicator for whether the state minimum wage exceeds the federal minimum wage measures the degree of policy divergence. This variable identifies when a state actively departs from the federal baseline and establishes its own binding wage floor. Crossing this threshold signals that wage-setting authority is being exercised at the state level in a way that may meaningfully alter local labor market conditions. In 2003, only 20 states maintained minimum wages above the federal level. By 2019, that number had increased to 30 states, representing nearly 60% of states adopting minimum wages above the federal minimum wage, as reported in Table 2.

Policy change frequency measures the intensity of policy intervention over time. Rather than focusing on any single increase, this variable captures how often a state adjusts its minimum

wage. A higher frequency reflects a more active regulatory environment, where wage policy is repeatedly revisited and recalibrated. This provides a proxy for the persistence of minimum wage policy within a state's broader labor market framework. As shown in Figure 1, many states increased their minimum wages frequently, with several implementing more than ten changes between 2003 and 2019. Vermont exhibited one of the highest adjustment frequencies, increasing its minimum wage annually during this period. In contrast, some states, such as Kentucky adjusted its minimum wage only three times, largely in response to increases in the federal minimum wage.

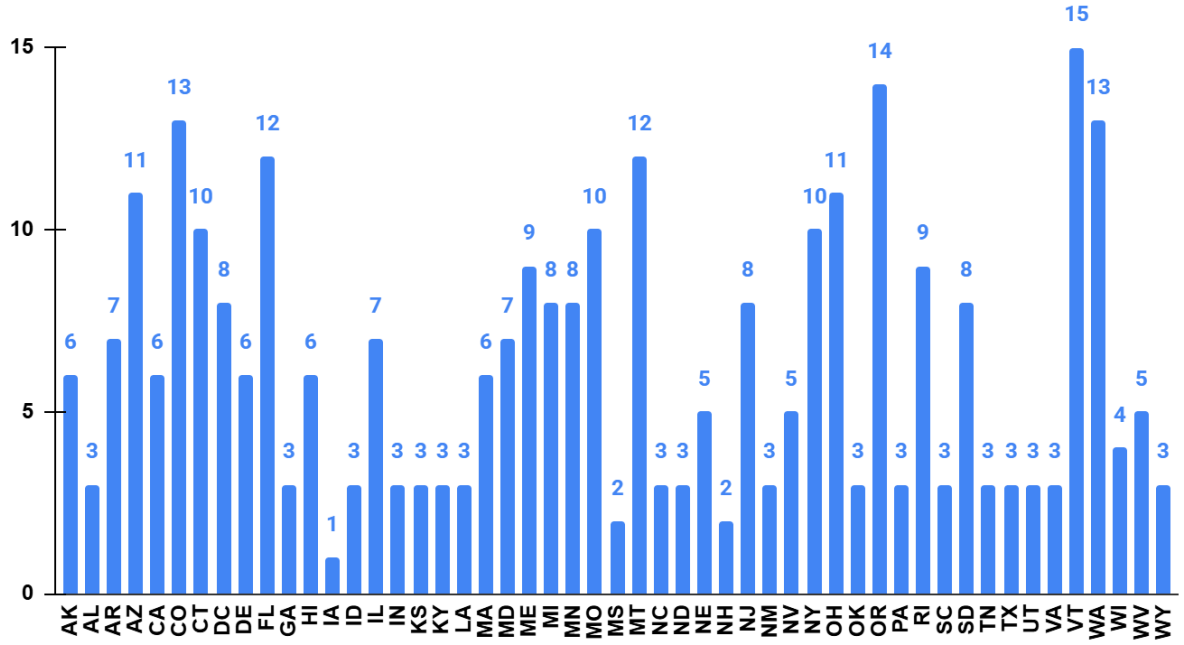
Overall, this multidimensional approach allows the analysis to assess whether behavioral responses are driven solely by wage levels or also by how wage policy is structured and implemented.

Table 2. Number and Share of States with Minimum Wages Above the Federal Level, 2003–2019

Year	Count of states w. higher than federal minimum wage	Percentage
2003	12	23.5%
2004	13	25.5%
2005	17	33.3%
2006	21	41.2%
2007	30	58.8%
2008	34	66.7%
2009	28	54.9%
2010	15	29.4%
2011	18	35.3%
2012	19	37.3%
2013	20	39.2%
2014	24	47.1%
2015	30	58.8%
2016	30	58.8%
2017	30	58.8%
2018	30	58.8%
2019	30	58.8%

Notes: Table reports the number and share of states in which the state minimum wage exceeded the federal minimum wage in each year.

Figure 1. Cumulative Number of Minimum Wage Changes by State, 2003–2019



Notes: Figure shows the cumulative number of state-level minimum wage changes from 2003 to 2019. Data is constructed from the UKCPR National Welfare Data.

3.2.2 Time use

For each activity category k, the dependent variable is defined as:

Y_kist = minutes per day individual i in state s and year t spends in activity k.

ATUS classifies activities using a six-digit coding structure organized into 18 major groups and corresponding detailed subcategories. While this system provides substantial granularity, many subcategories represent relatively small shares of daily time and are not economically distinct for the purposes of this study. To ensure interpretability, I consolidate all reported activities into nine mutually exclusive and collectively exhaustive categories.

The objective of this consolidation is twofold. First, it focuses on activity domains that account for the largest shares of daily time allocation, where behavioral adjustments to wage policy are most likely to occur. Second, it balances granularity and interpretability so that the categories are sufficient to distinguish across different purposes of time use, but not so narrowly defined that estimates become conceptually fragmented.

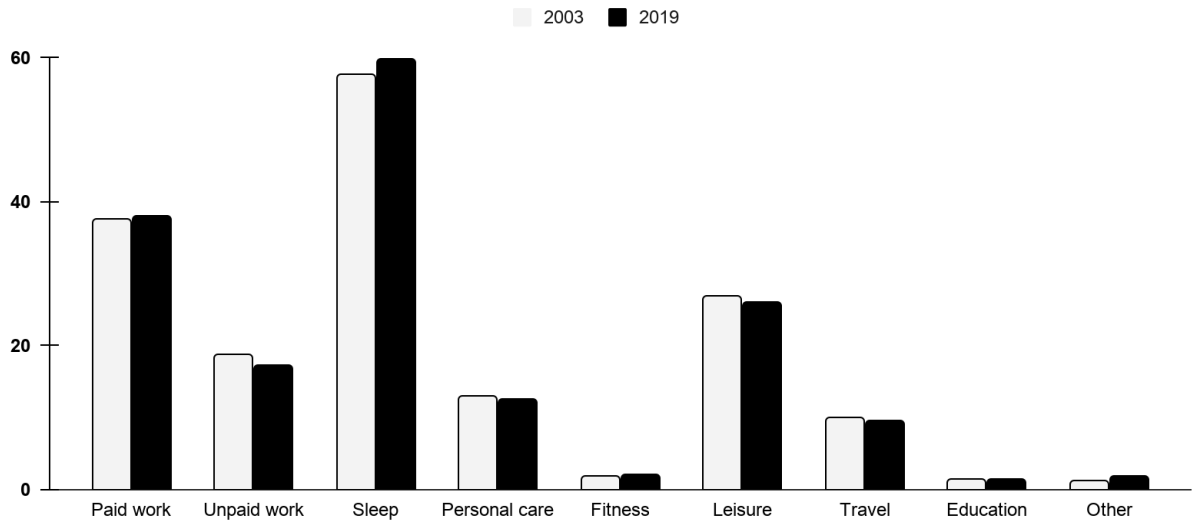
The nine categories are constructed as follows and detailed mappings between ATUS codes and each category are provided in Table A2 in the Appendix:

1. Paid Work includes working time, work-related activities, and other income-generating activities.

2. Unpaid Work includes household production and caregiving activities such as housework and child care. This category captures non-market production within the household and community.
3. Sleep includes time spent sleeping, including periods classified as sleeplessness within the sleep category.
4. Personal Care includes grooming, eating and drinking, and other activities reflect daily maintenance and self-care.
5. Fitness includes participation in sports and exercise and is separated from leisure because it is more directly health-related and may respond differently to income changes than purely recreational activities.
6. Leisure includes socializing, entertainment, and religious participation. This category captures discretionary non-market enjoyment activities.
7. Travel includes all travel time as it occupies a substantial share of daily time and functions as a necessary complement to other activities.
8. Education includes attending classes and other school / education related activities. It captures human capital investment.
9. Other includes remaining activities not classified above, such as legal and medical services that capture ad hoc responsibilities.

While ATUS uses minutes per day, summary statistics are presented in hours per week for interpretability. Descriptive statistics confirm that the aggregated categories are consistent with expected patterns of daily time use. On average, individuals work slightly less than 40 hours per week in paid employment and spend slightly more than eight hours per day sleeping, which aligns with established national time-use benchmarks. These patterns provide confidence that the constructed categories accurately capture the major domains of daily activity.

Figure 2. Average Weekly Time Allocation Across Activity Categories, 2003–2019



Notes: Figure displays average weekly time allocation in hours across activity categories using ATUS data from 2003–2019. Values are weighted using ATUS sampling weights. N = 108367. Data source: (U.S. Bureau of Labor Statistics, 2019)

Table 3. Weekly Time Allocation by Activity Category, 2003–2019 (ATUS)

Year	Sample size	Paid work	Unpaid work	Sleep	Personal care	Fitness	Leisure	Travel	Education	Other
2003	11185	37.4	18.6	57.6	12.9	1.9	26.9	10.0	1.4	1.3
2004	7591	37.9	18.5	57.3	13.1	1.9	26.8	9.9	1.6	1.0
2005	7185	37.6	18.5	58.1	13.2	1.8	26.3	9.6	1.5	1.4
2006	6982	38.4	17.7	58.0	13.0	1.8	26.4	9.7	1.5	1.4
2007	6696	38.4	18.6	57.7	12.9	1.9	26.1	9.5	1.3	1.5
2008	6894	37.9	18.2	58.0	13.0	1.8	26.7	9.3	1.5	1.5
2009	6713	37.1	18.2	58.5	13.1	1.9	26.8	9.5	1.4	1.5
2010	6588	37.8	17.7	57.9	13.5	1.8	26.5	9.4	1.2	2.2
2011	6186	38.4	17.5	58.2	13.1	1.9	26.4	9.6	1.2	1.7
2012	6124	38.5	16.9	58.3	13.1	1.9	27.1	9.5	1.3	1.5
2013	5642	37.7	17.5	58.8	13.2	2.0	26.5	9.3	1.1	1.9
2014	5728	39.5	17.2	58.9	12.7	1.9	26.3	9.0	1.2	1.4
2015	5430	38.0	17.6	59.4	12.8	2.0	26.1	9.5	1.2	1.4
2016	5148	37.9	17.0	59.3	12.7	2.1	26.6	9.5	1.3	1.5
2017	4943	38.2	17.4	59.4	12.7	1.8	26.3	9.5	1.3	1.4
2018	4720	37.9	17.4	59.5	12.7	1.8	26.6	9.3	1.3	1.6
2019	4612	38.0	17.2	59.7	12.6	1.9	26.0	9.5	1.3	1.8

Notes: Values represent average weekly hours spent in each activity category, aggregated from ATUS daily diary data. Activity categories are mutually exclusive and collectively exhaustive. Sample restricted to employed individuals aged 16–64. Weighted using ATUS sampling weights. N= 108367. Data source: (U.S. Bureau of Labor Statistics, 2019)

3.2.3 Other control variables

I included other control variables which were categorized into four groups:

- Pre-market covariates: age, sex, race/ethnicity, foreign-born, and citizenship status.
- Education controls: highest level of educational attainment.
- Family formation: marital status, number of children in the household, and whether children are present in the household.
- Job characteristics: usual hours worked per week, full-time versus part-time employment status, occupation, and industry of employment.

Together, these covariates help isolate the association between minimum wage policy measures and time use by controlling for key factors that would otherwise impact the estimates.

3.3 Empirical strategy

All specifications are estimated using a two-way fixed effects (TWFE) framework:

$$Y_{kist} = \alpha + \beta \cdot MWPolicy_{st} + X_{ist}\gamma + \alpha_s + \lambda_t + \varepsilon_{1}_{ist} \quad (1)$$

Where:

Y_{kist} = time spent in activity k

$MWPolicy_{st}$ = minimum wage policy variable of interest

X_{ist} = vector of individual control variables

α_s = state fixed effects

λ_t = year fixed effects

ε_{ist} = error term

State fixed effects control for time-invariant differences across states, such as persistent economic structure and demographic composition. Year fixed effects control for nationwide shocks that affect all states simultaneously, such as macroeconomic cycles (e.g., the Great Recession) and federal policy changes.

Identification comes from the fact that states changed their minimum wages at different times and by different amounts. The analysis therefore compares how time use changes within a state when its policy changes to how time use evolves over the same period in states where policy changed differently. In this way, the estimates reflect differences associated with changing minimum wage environments after accounting for persistent state characteristics and nationwide trends.

The TWFE framework identifies policy effects using within-state variation over time, comparing how time allocation changes when a state's policy environment changes relative to its own historical baseline. Although recent methodological work has highlighted potential limitations of TWFE estimators in staggered treatment settings with heterogeneous effects, TWFE provides a flexible framework (Callaway & Sant'Anna, 2021; Goodman-Bacon, 2021).

First, the primary objective of this study is not to estimate dynamic treatment effects from a single policy adoption event. Minimum wage policy evolves continuously through incremental adjustments. The estimand of interest is therefore the association between evolving policy environments and daily time allocation, rather than the causal effect at specific event-time horizons.

Second, the ATUS is a repeated cross-sectional survey rather than a panel dataset. While recent work has highlighted potential biases of two-way fixed effects estimators (Goodman-Bacon, 2021), these concerns are less central for this study, as individuals are not followed over time and the estimand does not rely on within-unit comparisons around policy changes. Instead, the analysis captures population-level differences across evolving policy environments. TWFE therefore provides a flexible way to control for persistent state characteristics and common time shocks while summarizing average associations across policy regimes.

Third, several policy measures examined in this paper are continuous or gradually evolving variables. Although modern staggered difference-in-differences estimators are well suited for discrete adoption designs, TWFE naturally accommodates continuous policy variation within a unified framework.

A key identifying assumption is that, conditional on fixed effects and observed covariates, changes in minimum wage policy are not systematically correlated with unobserved determinants of time use. Potential concerns include endogenous policy adoption and workforce composition changes. While these cannot be fully ruled out, the inclusion of sufficient controls and robustness checks mitigates these risks.

The effective minimum wage serves as the primary policy variable, capturing the wage floor. Additional measures capture distinct dimensions of policy design and are used to assess whether behavioral responses vary across policy environments.

Model 1. Continuous Minimum Wage Level

$$Y_kist = \beta_1 \cdot MW_st + X_ist \cdot \gamma + \alpha_s + \lambda_t + \varepsilon_1_ist \quad (2)$$

Where MW_st is the real effective minimum wage in state s and year t. The coefficient β_1 measures the change in minutes per day spent in activity k associated with a one-dollar increase in the effective minimum wage.

Model 2. Automatic Indexation Regime

$$Y_kist = \beta_2 \cdot Index_st + X_ist \cdot \gamma + \alpha_s + \lambda_t + \varepsilon_2_ist \quad (3)$$

Where Index_st = 1 if state s operates under automatic inflation indexation in year t.The coefficient β_2 captures the average difference in time allocation between indexed and non-indexed regimes. This model identifies whether rule-based wage growth alters daily behavior independently of the wage level itself.

Because only a small number of states (OH, MN, MT, SD, and VT) adopted automatic indexation during the sample period, staggered DiD is implemented as a robustness check rather than the primary specification.

Model 3. State Wage Above Federal Level

$$Y_kist = \beta_3 \cdot Comparison_st + X_ist \cdot \gamma + \alpha_s + \lambda_t + \varepsilon_3_ist \quad (4)$$

Where Comparison_st = 1 if the state minimum wage exceeds the federal minimum wage in year t. β_3 measures how time use changes when a state's wage floor is binding relative to the federal baseline. This indicator switches on and off over time due to changes in either the state minimum wage or the federal minimum wage.

Model 4. Policy Change Frequency

$Y_kist = \beta_4 \cdot ChangeFreq_st + X_ist \cdot \gamma + \alpha_s + \lambda_t + \varepsilon_4_ist$ (5)

Where ChangeFreq_st is the cumulative number of minimum wage changes enacted by state s from 2003 up to year t. β_4 reflects how exposure to a more active minimum wage policy environment ("intensity" of policy intervention) is associated with time allocation. TWFE identifies this effect by comparing the same state to itself as the cumulative count increases over time.

This approach allows the analysis to assess whether behavioral responses are primarily driven by the level of the minimum wage or whether they also vary with other institutional features of policy design.

4. Result

4.1 Minimum wage policies

Figure 3 presents the estimated coefficients and corresponding error bars, while Table 4 reports the coefficient estimates from the TWFE models examining the association between different dimensions of minimum wage policy and daily time allocation.

The primary specification focuses on the effective minimum wage. In Model 1, a one-dollar increase in the effective minimum wage is associated with a statistically significant decline of approximately 5.0 minutes of paid work per day ($p = 0.018$). On a weekly basis shown in Figure 4, this corresponds to roughly 35 fewer minutes of paid work, indicating moderate but measurable adjustments along the intensive margin rather than large changes in labor supply.

Across specifications, this reduction in paid work emerges as the most consistent finding. Alternative policy measures yield similar directional patterns. For example, a higher frequency of minimum wage adjustments (Model 4) is associated with a reduction of approximately 1.6 minutes per day ($p = 0.018$). Estimates for other policy dimensions are also generally negative, although less precisely estimated, reinforcing the evidence that minimum wage policy is associated with minor reductions in time spent on paid work.

Leisure shows a generally positive association with minimum wage policy, although the magnitude varies across specifications. In Model 1, a one-dollar increase in the effective minimum wage is associated with an increase of approximately 2.7 minutes of leisure per day, equivalent to about 19 minutes per week. The coefficient on the effective minimum wage is positive but not statistically significant ($p = 0.155$). Stronger effects are observed for alternative policy dimensions. In particular, automatic indexation (Model 2) is associated with an increase

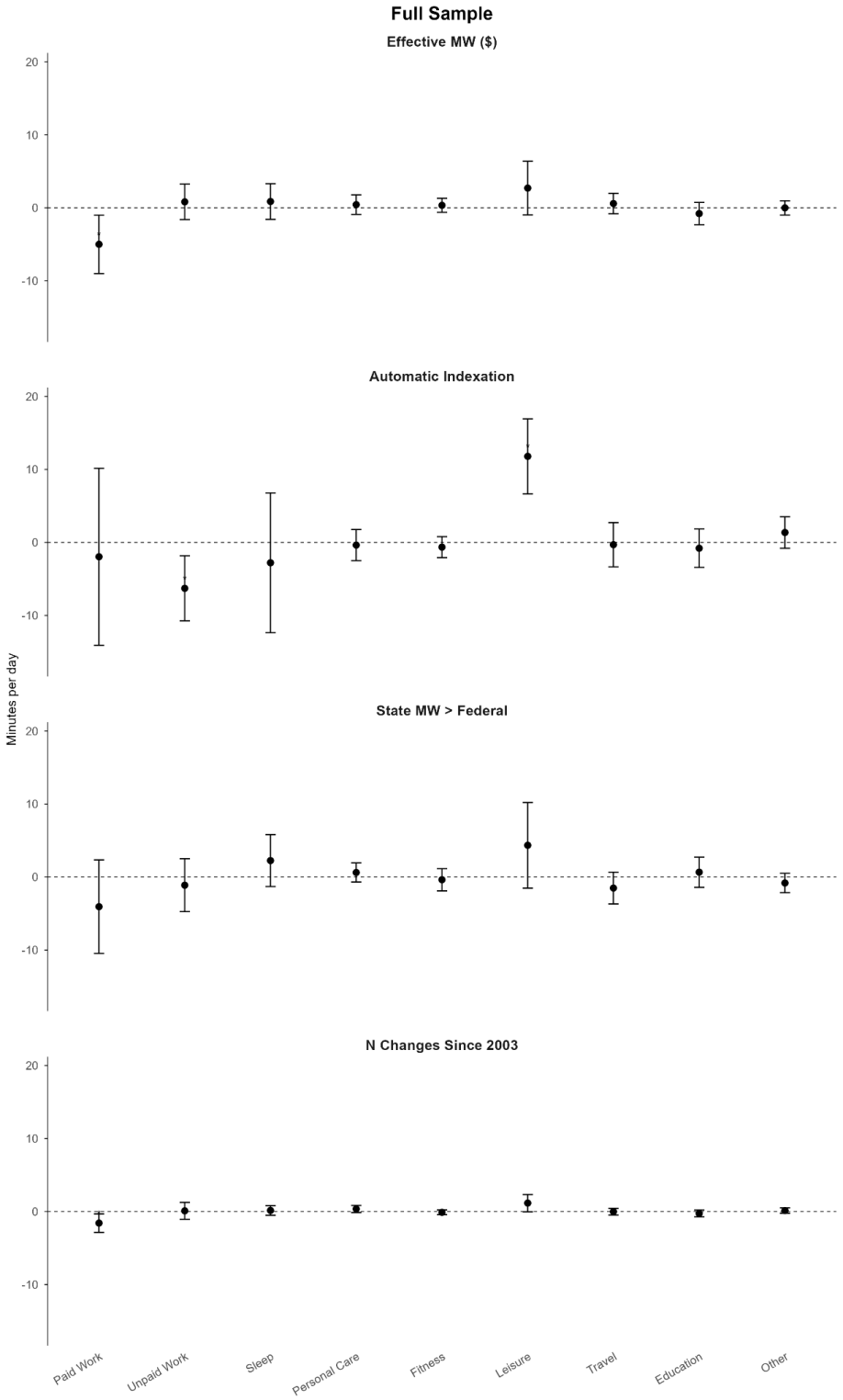
of approximately 11.8 minutes of leisure per day ($p < 0.001$), while policy change frequency (Model 4) is linked to a smaller increase of 1.2 minutes ($p = 0.058$). Overall, while leisure time tends to increase in response to minimum wage policy, both through higher minimum wage levels and more intensive policy intervention measured by automatic indexation, higher than federal level minimum wage, and more frequent adjustments, the estimated effects are not consistently statistically significant across all specifications.

Most other activity categories, including sleep, personal care, travel, education, and fitness, show small and statistically insignificant changes across models. The absence of large shifts in these domains suggests that adjustments occur primarily within more flexible components of time use rather than in biologically constrained activities (such as sleep) (Biddle & Hamermesh, 1990) or longer-term investments (such as education) (Becker, 1964).

Unpaid work displays mixed responses, declining significantly only under automatic indexation. This may reflect substitution away from home production when wage growth is more predictable, although the lack of consistent effects across specifications suggests that household responsibilities remain relatively inelastic to minimum wage policy. Estimates for automatic indexation are also less precise overall, as reflected in larger standard errors, likely due to the limited number of states (OH, MN, MT, SD, and VT) adopting indexation during the sample period.

Overall, the findings point to small shifts in how individuals allocate their time rather than large changes in behavior. Because the dependent variable measures minutes per day rather than employment status transitions, the estimates reflect adjustments along the intensive margin of time use. The observed pattern is consistent with individuals slightly reducing paid work as wages rise, while increases in leisure are more moderate and vary across policy dimensions.

Figure 3. Estimated Effects of Minimum Wage Policies on Time Use (Full Sample, TWFE)



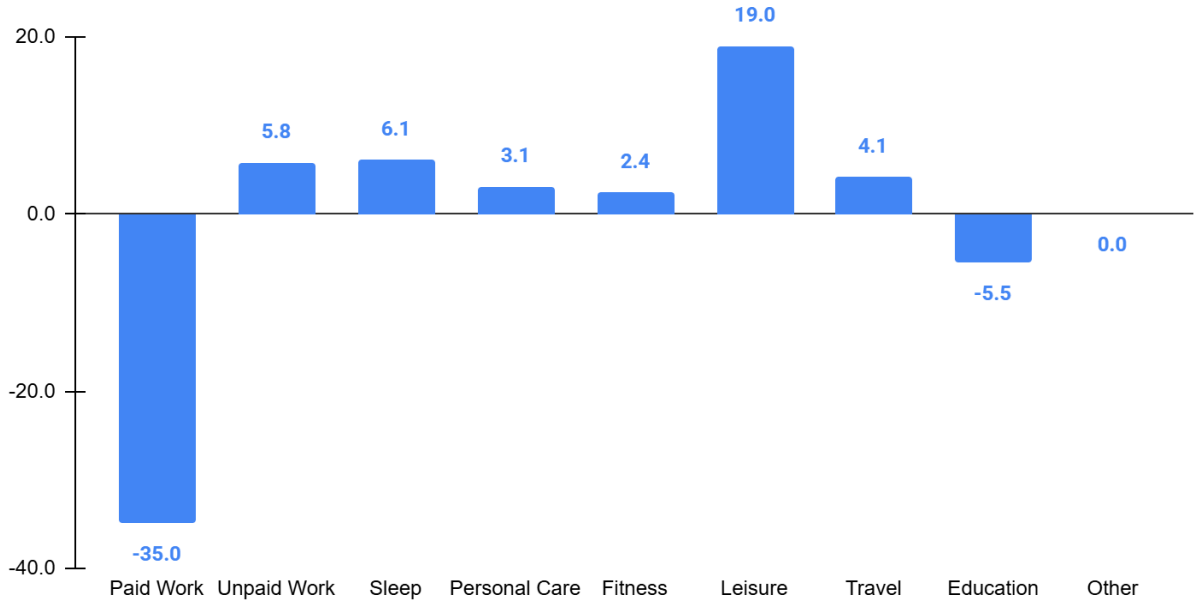
Notes: Figure plots estimated coefficients and 95% confidence intervals from two-way fixed effects regressions of time use on minimum wage policy measures. N= 108367. Data source: (U.S. Bureau of Labor Statistics, 2019)

Table 4. Effects of Minimum Wage Policies on Daily Time Allocation: Two-Way Fixed Effects Estimates

Outcome	M1: Effective MW ($)	M2: Auto Indexation	M3: State > Federal	M4: # Changes
Paid Work	-4.995** (2.044) p=0.018	-1.961 (6.186) p=0.753	-4.063 (3.273) p=0.220	-1.571** (0.644) p=0.018
Unpaid Work	0.825 (1.242) p=0.510	-6.288*** (2.275) p=0.008	-1.121 (1.850) p=0.547	0.103 (0.588) p=0.861
Sleep	0.869 (1.246) p=0.489	-2.785 (4.885) p=0.571	2.254 (1.813) p=0.220	0.156 (0.337) p=0.646
Personal Care	0.442 (0.681) p=0.519	-0.363 (1.089) p=0.740	0.618 (0.671) p=0.361	0.361 (0.251) p=0.156
Fitness	0.347 (0.489) p=0.482	-0.645 (0.732) p=0.383	-0.370 (0.776) p=0.636	-0.099 (0.168) p=0.557
Leisure	2.708 (1.876) p=0.155	11.790*** (2.625) p=<0.001	4.347 (2.986) p=0.152	1.169* (0.602) p=0.058
Travel	0.591 (0.710) p=0.409	-0.312 (1.549) p=0.841	-1.511 (1.110) p=0.180	-0.005 (0.235) p=0.982
Education	-0.785 (0.775) p=0.316	-0.796 (1.345) p=0.557	0.663 (1.057) p=0.534	-0.253 (0.239) p=0.296
Other	-0.003 (0.499) p=0.995	1.360 (1.101) p=0.223	-0.818 (0.673) p=0.230	0.139 (0.184) p=0.452

*Notes: Each column reports coefficients from separate two-way fixed effects (TWFE) regressions of minutes per day spent in each activity on different minimum wage policy measures. All specifications include individual-level controls, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and reported in parentheses. Significance levels are indicated as follows: * p < 0.10, ** p < 0.05, *** p < 0.01. N= 108367. Data source: (U.S. Bureau of Labor Statistics, 2019).*

Figure 4. Estimated Effects of Minimum Wage on Weekly Time Use



Note: Bars represent estimated changes in weekly time use (in minutes) associated with a one-dollar increase in the effective minimum wage. N= 108367. Data source: (U.S. Bureau of Labor Statistics, 2019).

4.2 Heterogeneity analysis

To examine whether responses to minimum wage policies differ across demographic and socioeconomic groups, I estimate the main specifications separately for women, individuals with a high school degree or less, and individuals with children in the household (parents).

Women and individuals with lower educational attainment are more likely to be directly exposed to minimum wage policies through employment in low-wage labor markets, while parents may exhibit different behavioral responses due to greater household production and caregiving responsibilities. These subgroup analyses therefore provide insight into whether minimum wage policies affect time allocation differently across workers facing distinct labor market and household constraints.

I also examine teens as a potentially affected group. However, due to limited sample size , these results are not included in the main analysis and are instead reported in the Appendix.

Focusing on the effective minimum wage, the primary specification shows that reductions in paid work are more pronounced among individuals with lower educational attainment and, to a lesser extent, among women, while results for parents are more comparable to those in the full sample. This suggests that individuals more closely tied to low-wage employment exhibit stronger adjustments along the intensive margin when wages increase.

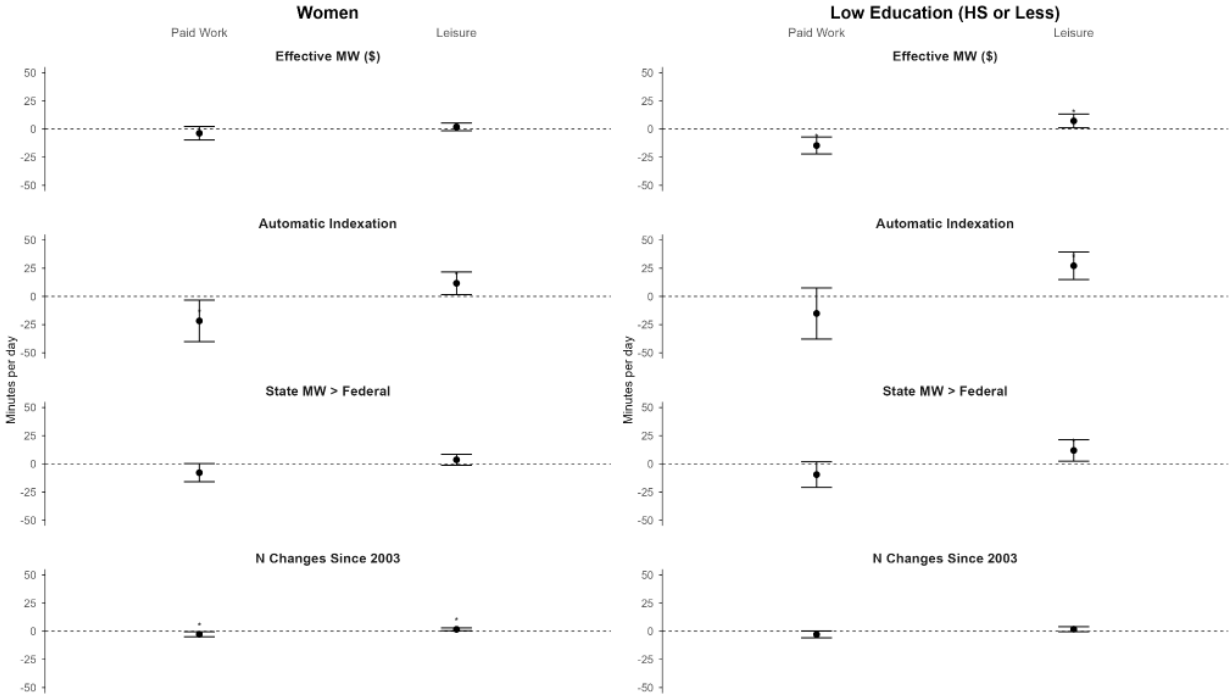
Across alternative policy dimensions, this pattern remains broadly consistent. Estimates for policy change frequency and automatic indexation similarly indicate reductions in paid work, although magnitudes and statistical significance vary across subgroups.

Leisure responses are generally positive across subgroups but remain uneven in strength. Increases in leisure are more pronounced among individuals with lower educational attainment, particularly under automatic indexation, where effects are larger and statistically significant. However, for the effective minimum wage itself, leisure effects are smaller and not consistently statistically significant across groups, with significance observed among individuals with lower educational attainment.

For women, increases in leisure are less consistently observed. This suggests that time freed from market work may be absorbed by relatively inflexible responsibilities, such as household production or caregiving, rather than translating directly into additional discretionary time.

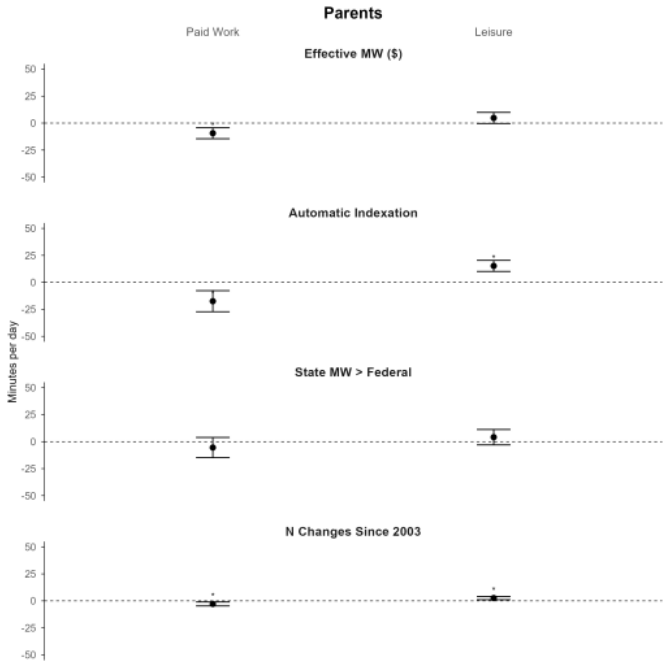
Despite these differences in magnitude, the overall scale of adjustment remains modest across all groups. Estimates are broadly consistent in direction, with reductions in paid work and generally positive but less significant changes in leisure. The heterogeneity analysis therefore reinforces the main finding that minimum wage policies are associated with incremental reallocations of time rather than substantial behavioral changes, with somewhat stronger responses among populations most directly exposed to wage regulation.

Figure 5. Effects of Minimum Wage Policies on Paid Work and Leisure - Women and Lower Education



Notes: Figure compares estimated effects of minimum wage policy on paid work and leisure across subgroups, including women and low-education individuals. Estimates are derived from separate two-way fixed effects regressions for each subgroup. N is 54873 for women, and 32720 for low-education individuals. Data source: (U.S. Bureau of Labor Statistics, 2019)

Figure 6. Effects of Minimum Wage Policies on Paid Work and Leisure - Parents



Notes: Figure compares estimated effects of minimum wage policy on paid work and leisure among parents. Estimates are derived from separate two-way fixed effects regressions. N is 58403. Data source: (U.S. Bureau of Labor Statistics, 2019).

4.3 Robustness

To assess the robustness of the results to model specification, I re-estimated the main TWFE models using a reduced set of controls, including age, sex, education, marital status, presence of children, and employment status. This specification excludes detailed occupation, industry, and additional demographic controls that may be highly collinear with policy exposure or absorb variation related to minimum wage changes. Results table A3-A6 could be found in the appendix.

The motivation for using a reduced set of controls is twofold. First, detailed occupation and industry variables may partially capture the channels through which minimum wage policies operate, such as shifts in job composition, and therefore risk over-controlling for policy-relevant variation. Second, including a large number of controls may introduce multicollinearity and reduce estimation precision without substantially improving identification, particularly in a framework that already includes state and year fixed effects.

The results from the reduced-control specification are broadly consistent with the main findings. The negative association between minimum wage policy and paid work remains evident across specifications, with similar magnitudes and statistical significance. This reinforces the conclusion that minimum wage increases are associated with minor reductions in time spent on paid work.

Leisure continues to show a generally positive association with minimum wage policy, although, as in the main results, the magnitude and statistical significance of these effects vary across specifications. In particular, stronger but less precise estimates continue to appear for alternative policy dimensions such as automatic indexation, while effects for the effective minimum wage remain smaller but statistically significant for the full sample.

Across both the full-control and reduced-control models, most other activity categories show limited changes, suggesting that adjustments are concentrated in more flexible components of time use. The similarity in results across specifications reflects the role of state and year fixed effects, which absorb a substantial portion of the relevant policy variation at the state-year level.

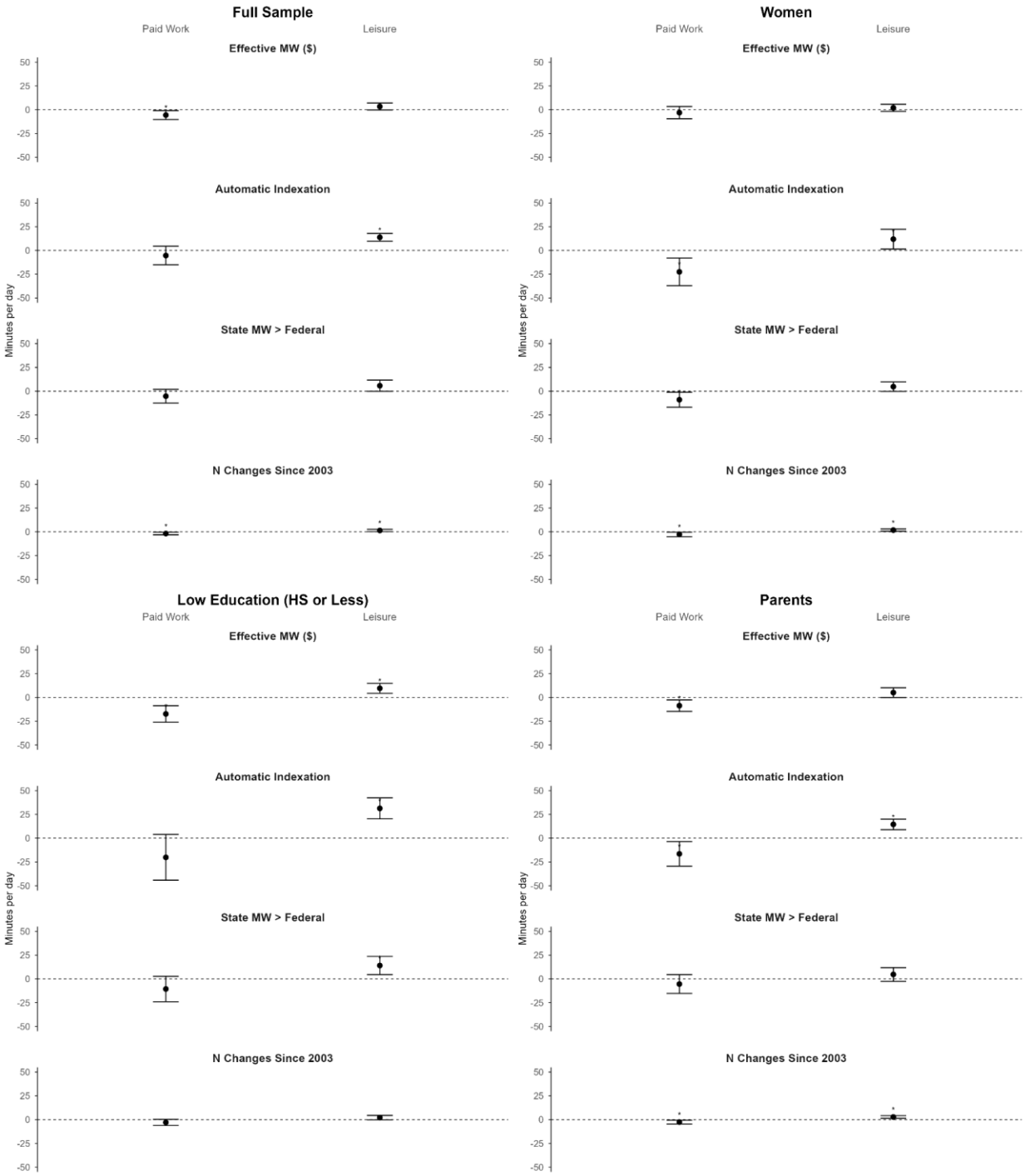
Overall, these findings indicate that the main results are not driven by overfitting or by the inclusion of an extensive set of controls. Instead, the core pattern remains stable across alternative model specifications, and the consistency suggests that the observed relationships are not driven by modeling choices or specific policy definitions, but reflect a general pattern of modest time reallocation associated with minimum wage policy instead.

I additionally estimate specifications without control variables to assess whether the main findings are primarily driven by the inclusion of individual-level covariates. Results are reported in Appendix Figure A1. Given that the models already include state and year fixed effects, the

no-control specification provides a parsimonious benchmark that relies mainly on within-state policy variation over time. The results remain broadly consistent with the main findings, suggesting that the estimated relationships are not sensitive to the inclusion of control variables.

Additional robustness checks, including a staggered difference-in-differences analysis of automatic indexation adoption and supplementary subgroup analyses (teenagers), yield qualitatively similar patterns. These results are reported in Figure A2 in the Appendix.

Figure 7. Robustness Test - TWFE Estimates with Reduced Control Variables



Notes: Figure presents estimated coefficients from models with reduced control variables. N is 108367 for the full sample, 54873 for women, 32720 for low-education individuals, and 58403 for parents. Data source: (U.S. Bureau of Labor Statistics, 2019).

5. Discussion

This paper examines how minimum wage policy is associated with changes in daily time allocation. The results indicate that minimum wage increases are linked to modest but consistent reductions in time spent on paid work, while changes in leisure are generally positive but less significant. These findings suggest that minimum wage policy affects behavior not only through earnings and employment outcomes, but also through adjustments in how individuals allocate their time. This interpretation is consistent with labor-leisure models of time allocation, which emphasize how individuals reallocate time between market work, home production, and leisure in response to changes in wages and economic incentives (Gronau, 1977).

The observed reduction in paid work is consistent with income effects playing an important role. While higher wages increase the opportunity cost of non-work time, they also raise income, allowing individuals to sustain a given level of consumption with fewer hours of labor. The results suggest that, on average, this income channel is salient. However, because the empirical approach does not separately identify income and substitution effects, the estimates should be interpreted as reflecting their combined influence rather than a clean decomposition.

Importantly, reductions in paid work do not translate one-for-one into increases in leisure. Although leisure coefficients are generally positive, they are not consistently statistically significant across specifications, particularly for the effective minimum wage. This indicates that time freed from market work is not exclusively reallocated to discretionary activities. Instead, it is likely distributed across multiple uses, including unpaid work, caregiving, and other responsibilities. As a result, the relationship between minimum wage policy and leisure should be understood as indirect and context-dependent rather than mechanical.

The heterogeneity analysis reinforces this interpretation by showing that adjustments in time use vary across groups. Reductions in paid work are most pronounced among individuals with lower educational attainment and among parents.. For women, while reductions in paid work are similar in magnitude to the full sample, increases in leisure are less consistently observed. This pattern is consistent with the idea that time freed from paid work may be absorbed by relatively inflexible responsibilities, such as household production or caregiving, rather than translating into additional discretionary time. These findings highlight that the ability to reallocate time depends not only on changes in wages, but also on existing constraints and household structure.

Across all specifications, the magnitude of the estimated effects remains modest. The results do not indicate large shifts in labor supply or substantial changes in daily routines, but rather incremental adjustments. However, the consistency of the decline in paid work across specifications suggests that these effects reflect a systematic pattern. When aggregated across individuals, even small changes in daily time allocation may correspond to meaningful shifts at the population level.

An additional contribution of the analysis is the multidimensional treatment of minimum wage policy. While the effective minimum wage captures changes in the overall wage floor, alternative policy measures, such as automatic indexation, state–federal differentials, and the frequency of policy changes, provide insight into how policy design may shape behavioral responses. The results suggest that these dimensions do not operate uniformly. In particular, automatic indexation is associated with larger changes in time allocation, especially for leisure, although estimates are less precise due to the limited number of adopting states. These findings indicate that behavioral responses may vary across different policy environments, rather than depending solely on the level of the minimum wage.

For example, differences across policy regimes may reflect underlying features such as the timing and structure of policy adjustments, although these mechanisms cannot be directly identified in the current analysis. This could be consistent with the idea that not only the level of the minimum wage, but also aspects of policy design, influence how individuals adjust their behavior. As such, minimum wage policy may affect time use not only through its magnitude, but also through how policy changes are implemented.

These findings should be interpreted in light of several limitations. The two-way fixed effects framework relies on comparisons within states over time and may be sensitive to issues arising from staggered policy changes and heterogeneous treatment effects. While additional analyses provide supporting evidence, the estimates are best understood as capturing average associations rather than fully causal effects in all dimensions. In addition, the repeated cross-sectional structure of the ATUS means that the analysis compares different individuals across time rather than tracking the same individuals longitudinally. As a result, the results reflect population-level differences across policy environments rather than within-person behavioral responses.

Measurement constraints in time-use data also warrant consideration. Although diary data provide detailed information on daily activities, they rely on self-reported primary activities and may not fully capture multitasking or overlapping responsibilities. This is particularly relevant for unpaid work and caregiving, where time may be fragmented across activities. Consequently, some reallocations of time may not be fully observed in the data, especially when they occur alongside other activities.

Despite these limitations, the results contribute to a broader understanding of minimum wage policy. Much of the existing literature focuses on employment and earnings outcomes, which remain central, but does not fully capture how individuals adjust their daily lives. By showing that minimum wage increases are associated with small but systematic changes in time allocation, particularly reductions in paid work and more limited changes in leisure, this paper highlights an additional channel through which policy may impact.

The findings also point to several directions for future research. One avenue would be to link time-use changes more directly to measures of well-being, such as mental health and life satisfaction, to better understand the broader implications of behavioral adjustments. Another

would be to examine dynamic responses around policy changes using designs that more precisely isolate timing effects, particularly in settings with clearer policy discontinuities. A third direction would be to explore household-level adjustments in greater detail, especially given the limited ability of time-use data to fully capture multitasking and overlapping responsibilities, which may be particularly important for understanding gender differences in caregiving and unpaid work.

Overall, the analysis shows that minimum wage policy is associated with modest but systematic shifts in how individuals allocate their time, most clearly reflected in reductions in paid work and increase in leisure. While these adjustments are small at the individual level, their consistency across specifications suggests a meaningful behavioral response. More broadly, the results highlight that labor market policies influence not only whether individuals work, but how they organize their daily lives. By bringing time allocation into the analysis, this paper points to an additional margin through which minimum wage policy operates and extends beyond traditional employment and earnings outcomes, offering a more complete view of how economic constraints shape behavior.

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Appendix

Table A1. Effective Minimum Wage by State: 2003 vs. 2019

State	Effective Minimum Wage in 2003	Effective Minimum Wage in 2019	2019 CPI Adjusted Minimum Wage
AL	5.15	7.25	5.21
AK	7.15	10.19	7.32
AZ	5.15	12.00	8.62
AR	5.15	9.25	6.64
CA	6.75	12.00	8.62
CO	5.15	12.00	8.62
CT	6.90	11.00	7.90
DE	6.15	9.25	6.64
DC	6.15	14.00	10.05
FL	5.15	8.56	6.15
GA	5.15	7.25	5.21
HI	6.25	10.10	7.25
ID	5.15	7.25	5.21
IL	5.15	9.25	6.64
IN	5.15	7.25	5.21
IA	5.15	7.25	5.21
KS	5.15	7.25	5.21
KY	5.15	7.25	5.21
LA	5.15	7.25	5.21
ME	6.25	12.00	8.62
MD	5.15	11.00	7.90
MA	6.75	12.75	9.15
MI	5.15	9.65	6.93
MN	5.15	10.00	7.18
MS	5.15	7.25	5.21
MO	5.15	9.45	6.78

MT	5.15	8.65	6.21
NE	5.15	9.00	6.46
NV	5.15	8.25	5.92
NH	5.15	7.25	5.21
NJ	5.15	11.00	7.90
NM	5.15	9.00	6.46
NY	5.15	11.80	8.47
NC	5.15	7.25	5.21
ND	5.15	7.25	5.21
OH	5.15	8.70	6.25
OK	5.15	7.25	5.21
OR	6.90	11.25	8.08
PA	5.15	7.25	5.21
RI	6.15	10.50	7.54
SC	5.15	7.25	5.21
SD	5.15	9.30	6.68
TN	5.15	7.25	5.21
TX	5.15	7.25	5.21
UT	5.15	7.25	5.21
VT	6.25	10.96	7.87
VA	5.15	7.25	5.21
WA	7.01	13.50	9.69
WV	5.15	8.75	6.28
WI	5.15	7.25	5.21
WY	5.15	7.25	5.21
Federal	5.15	7.25	5.21
Min	***5.15***	***7.25***	***5.21***
Max	***7.15***	***14.00***	***10.05***
Mean	***5.48***	***9.12***	***6.55***

Notes: Effective minimum wage is defined as the higher of the state and federal minimum wage in each state-year. Data are drawn from the UKCPR National Welfare Data.

Table A2. ATUS Activity Categories

Activity Categories	Activity Codes
Paid Work	0501 Working
	0502 Work-related activities
	0503 Other income-generating activities
	0599 Work & work-related activities n.e.c.
Unpaid Work	0201 Housework
	0202 Food & drink preparation
	0203 Interior maintenance
	0204 Exterior maintenance
	0205 Lawn & garden
	0206 Animals & pets
	0207 Vehicles
	0208 Appliances & tools
	0209 Household management
	0299 Household activities n.e.c.
	0301 Caring for & helping household children
	0302 Household children's education
	0303 Household children's health
	0304 Caring for household adults
	0305 Helping household adults
	0399 Caring for & helping household members n.e.c.
	0401 Caring for & helping nonhousehold children
	0402 Nonhousehold children's education

	0403 Nonhousehold children's health
	0404 Caring for nonhousehold adults
	0405 Helping nonhousehold adults
	0499 Caring for & helping nonhousehold members n.e.c.
	0701 Shopping
	0702 Researching purchases
	0703 Security procedures for purchases
	0799 Consumer purchases n.e.c.
	0801 Childcare Services
	0802 Financial services & banking
	0806 Real estate services
	0807 Veterinary services
	0901 Household services (not done by self)
	0902 Home maintenance/repair services
	0903 Pet services
	0904 Lawn & garden services
	0905 Vehicle repair services
	0999 Household services n.e.c.
	1501 Administrative & support volunteer work
	1502 Social service & care volunteer work
	1503 Maintenance/building volunteer work
	1504 Performance & cultural volunteer work
	1505 Meetings & training volunteer work
	1506 Public health & safety volunteer work

	1599 Volunteer activities n.e.c.
	160104 Telephone calls to/from salespeople
	160106 Telephone calls to/from household services providers
	160107 Telephone calls to/from paid child or adult care providers
Sleep	0101 Sleeping
Personal Care	0102 Grooming
	0103 Health-related self care
	0104 Personal activities
	0105 Personal care emergencies
	0199 Personal care n.e.c.
	0805 Personal care services
	1101 Eating and drinking
	1102 Waiting associated with eating and drinking
	1199 Eating and drinking n.e.c.
Fitness	1301 Participating in sports/exercise
	1399 Sports, exercise, and recreation n.e.c.
Leisure	1201 Socializing and communicating
	1202 Attending/hosting social events
	1203 Relaxing and leisure
	1204 Arts and entertainment
	1205 Waiting for socializing/leisure
	1299 Socializing, relaxing, and leisure n.e.c.
	1302 Attending sports events
	1303 Waiting associated with sports

	1304 Security procedures for sports
	1401 Religious/spiritual practices
	1499 Religious and spiritual n.e.c.
	160101 Telephone calls to/from family members
	160102 Telephone calls to/from friends, neighbors, or acquaintances
Travel	1801 Travel related to personal care
	1802 Travel related to household activities
	1803 Travel related to caring for household members
	1804 Travel related to caring for nonhousehold members
	1805 Travel related to work
	1806 Travel related to education
	1807 Travel related to shopping/purchases
	1808 Travel related to professional/personal care services
	1809 Travel related to household services
	1810 Travel related to government & civic
	1811 Travel related to eating and drinking
	1812 Travel related to socializing & leisure
	1813 Travel related to sports & recreation
	1814 Travel related to religious/spiritual activities
	1815 Travel related to volunteering
	1816 Travel related to phone calls
	1818 Security procedures for traveling

	1899 Traveling n.e.c.
Education	0601 Taking class
	0602 Extracurricular school activities
	0603 Research / homework
	0604 Registration / administrative education
	0699 Education n.e.c.
	160103 Telephone calls to/from education services providers
Other	0504 Job search & interviewing
	0803 Legal services
	0804 Medical & care services
	0808 Security procedures for professional services
	0899 Professional & personal services n.e.c.
	1001 Government services
	1002 Civic obligations & participation
	1003 Waiting for government/civic
	1004 Security procedures for government/civic
	1099 Government services n.e.c.
	160105 Telephone calls to/from professional or personal care svcs providers
	160108 Telephone calls to/from government officials
	1699 Telephone calls n.e.c.
	5001 Unable to Code
	5099 Data codes, n.e.c.

Robustness Test Results

Table A3. Effects of Minimum Wage Policies on Daily Time Allocation: Two-Way Fixed Effects Estimates w/ Fewer Control Variables; Full Sample

Outcome	M1: Effective MW ($)	M2: Auto Indexation	M3: State > Federal	M4: # Changes
Paid Work	-5.614** (2.392) p=0.023	-5.348 (4.993) p=0.289	-5.298 (3.677) p=0.156	-1.795** (0.712) p=0.015
Unpaid Work	0.658 (1.226) p=0.594	-4.963** (1.967) p=0.015	-1.288 (1.892) p=0.499	0.001 (0.564) p=0.998
Sleep	1.094 (1.119) p=0.333	-1.589 (4.638) p=0.733	2.532 (1.839) p=0.175	0.290 (0.310) p=0.354
Personal Care	0.130 (0.661) p=0.844	-0.981 (1.309) p=0.457	0.427 (0.714) p=0.553	0.294 (0.249) p=0.242
Fitness	0.409 (0.470) p=0.389	-0.814 (0.677) p=0.235	-0.466 (0.802) p=0.564	-0.112 (0.172) p=0.517
Leisure	3.397* (1.844) p=0.071	13.814*** (2.093) p=<0.001	5.718* (3.006) p=0.063	1.446** (0.617) p=0.023
Travel	0.641 (0.703) p=0.366	-0.400 (1.304) p=0.760	-1.431 (1.058) p=0.182	-0.049 (0.200) p=0.808
Education	-0.789 (0.825) p=0.343	-0.986 (1.184) p=0.409	0.555 (1.055) p=0.601	-0.228 (0.251) p=0.367
Other	0.074 (0.497) p=0.883	1.266 (1.042) p=0.230	-0.747 (0.682) p=0.279	0.153 (0.181) p=0.403

*Notes: Each column reports coefficients from separate two-way fixed effects (TWFE) regressions of minutes per day spent in each activity on different minimum wage policy measures. All specifications include individual-level controls, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and reported in parentheses. Significance levels are indicated as follows: * p < 0.10, ** p < 0.05, *** p < 0.01. N= 108367. Data source: (U.S. Bureau of Labor Statistics, 2019).*

Table A4. Effects of Minimum Wage Policies on Daily Time Allocation: Two-Way Fixed Effects Estimates w/ Fewer Control Variables; Women Only

Outcome	M1: Effective MW ($)	M2: Auto Indexation	M3: State > Federal	M4: # Changes
Paid Work	-3.045 (3.288) p=0.359	-22.538*** (7.429) p=0.004	-9.028** (4.006) p=0.029	-2.775** (1.213) p=0.026
Unpaid Work	0.506 (2.119) p=0.812	5.842 (4.095) p=0.160	0.148 (2.693) p=0.956	0.839 (0.682) p=0.224
Sleep	-0.449 (1.684) p=0.791	-0.127 (5.602) p=0.982	3.843** (1.469) p=0.012	-0.201 (0.452) p=0.658

Personal Care	0.858 (1.124) p=0.449	0.725 (4.262) p=0.866	0.365 (1.331) p=0.785	0.187 (0.330) p=0.573
Fitness	0.015 (0.452) p=0.973	1.288 (1.319) p=0.334	-0.383 (0.596) p=0.524	-0.049 (0.184) p=0.793
Leisure	2.034 (1.941) p=0.300	11.893** (5.323) p=0.030	4.722* (2.526) p=0.067	1.837*** (0.668) p=0.008
Travel	1.740 (1.072) p=0.111	2.364 (4.976) p=0.637	0.179 (1.432) p=0.901	-0.106 (0.307) p=0.731
Education	-1.419 (1.255) p=0.264	0.285 (2.212) p=0.898	0.492 (1.684) p=0.771	0.104 (0.405) p=0.799
Other	-0.240 (0.729) p=0.743	0.270 (1.951) p=0.891	-0.338 (0.984) p=0.733	0.164 (0.275) p=0.553

*Notes: Each column reports coefficients from separate two-way fixed effects (TWFE) regressions of minutes per day spent in each activity on different minimum wage policy measures. All specifications include individual-level controls, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and reported in parentheses. Significance levels are indicated as follows: * p < 0.10, ** p < 0.05, *** p < 0.01. N= 54873. Data source: (U.S. Bureau of Labor Statistics, 2019).*

Table A5. Effects of Minimum Wage Policies on Daily Time Allocation: Two-Way Fixed Effects Estimates w/ Fewer Control Variables; Low Education Only

Outcome	**M1: Effective MW ($)**	**M2: Auto Indexation**	**M3: State > Federal**	**M4: # Changes**
Paid Work	-17.279*** (4.433) p=<0.001	-20.164 (12.286) p=0.107	-10.602 (6.817) p=0.126	-2.943* (1.658) p=0.082
Unpaid Work	2.009 (2.682) p=0.457	-9.971** (4.167) p=0.021	-4.936 (3.575) p=0.173	-0.414 (1.174) p=0.725
Sleep	7.464*** (2.656) p=0.007	6.814 (5.850) p=0.250	4.475 (3.643) p=0.225	1.833** (0.855) p=0.037
Personal Care	-0.957 (1.131) p=0.401	-4.478* (2.637) p=0.096	1.479 (1.683) p=0.384	0.022 (0.391) p=0.955
Fitness	0.369 (0.765) p=0.631	-0.030 (1.246) p=0.981	-0.721 (1.653) p=0.665	-0.487 (0.465) p=0.300
Leisure	9.673*** (2.662) p=<0.001	31.379*** (5.657) p=<0.001	14.090*** (4.893) p=0.006	2.135* (1.189) p=0.078
Travel	-0.120 (1.730) p=0.945	-0.807 (2.297) p=0.727	-0.823 (2.089) p=0.695	0.075 (0.518) p=0.886

Education	-0.827 (1.307) p=0.530	-3.145** (1.196) p=0.011	-1.977 (1.417) p=0.169	-0.089 (0.401) p=0.826
Other	-0.331 (0.680) p=0.629	0.402 (1.208) p=0.741	-0.985 (0.776) p=0.210	-0.132 (0.261) p=0.616

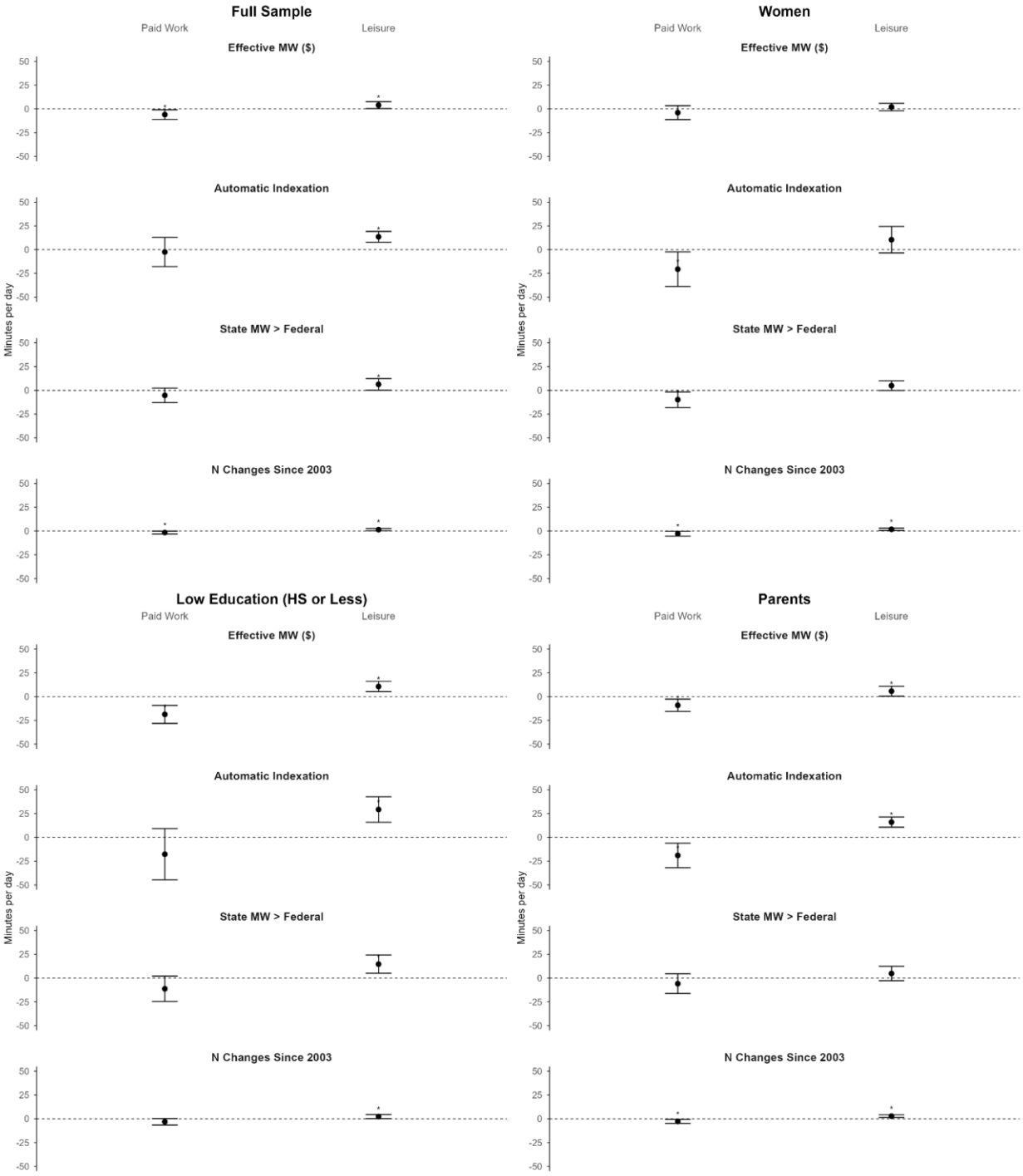
*Notes: Each column reports coefficients from separate two-way fixed effects (TWFE) regressions of minutes per day spent in each activity on different minimum wage policy measures. All specifications include individual-level controls, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and reported in parentheses. Significance levels are indicated as follows: * p < 0.10, ** p < 0.05, *** p < 0.01. N= 32720. Data source: (U.S. Bureau of Labor Statistics, 2019).*

Table A6. Effects of Minimum Wage Policies on Daily Time Allocation: Two-Way Fixed Effects Estimates w/ Fewer Control Variables; Parents Only

Outcome	**M1: Effective MW ($)**	**M2: Auto Indexation**	**M3: State > Federal**	**M4: # Changes**
Paid Work	-8.574*** (3.059) p=0.007	-16.449** (6.584) p=0.016	-5.419 (5.023) p=0.286	-2.620** (0.989) p=0.011
Unpaid Work	0.600 (2.049) p=0.771	3.499 (3.066) p=0.259	0.920 (3.201) p=0.775	-0.093 (0.772) p=0.904
Sleep	0.973 (1.305) p=0.459	6.714 (5.190) p=0.202	3.932* (2.052) p=0.061	0.666 (0.574) p=0.252
Personal Care	0.119 (0.696) p=0.865	-2.097 (1.766) p=0.241	0.187 (1.076) p=0.863	0.004 (0.234) p=0.987
Fitness	0.702 (0.634) p=0.274	-3.451 (3.041) p=0.262	-0.500 (0.955) p=0.603	-0.347 (0.260) p=0.188
Leisure	5.185* (2.621) p=0.053	14.526*** (2.828) p=<0.001	4.681 (3.696) p=0.211	2.754*** (0.700) p=<0.001
Travel	1.647* (0.929) p=0.082	-2.903* (1.453) p=0.051	-2.356* (1.200) p=0.055	0.016 (0.253) p=0.948
Education	-0.916 (1.110) p=0.413	-1.056 (1.107) p=0.344	-1.502 (1.017) p=0.146	-0.424 (0.268) p=0.119
Other	0.265 (0.578) p=0.648	1.217* (0.680) p=0.080	0.057 (0.680) p=0.934	0.044 (0.192) p=0.819

*Notes: Each column reports coefficients from separate two-way fixed effects (TWFE) regressions of minutes per day spent in each activity on different minimum wage policy measures. All specifications include individual-level controls, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and reported in parentheses. Significance levels are indicated as follows: * p < 0.10, ** p < 0.05, *** p < 0.01. N= 58403. Data source: (U.S. Bureau of Labor Statistics, 2019).*

Figure A1. Robustness Test - TWFE Estimates with No Control Variables

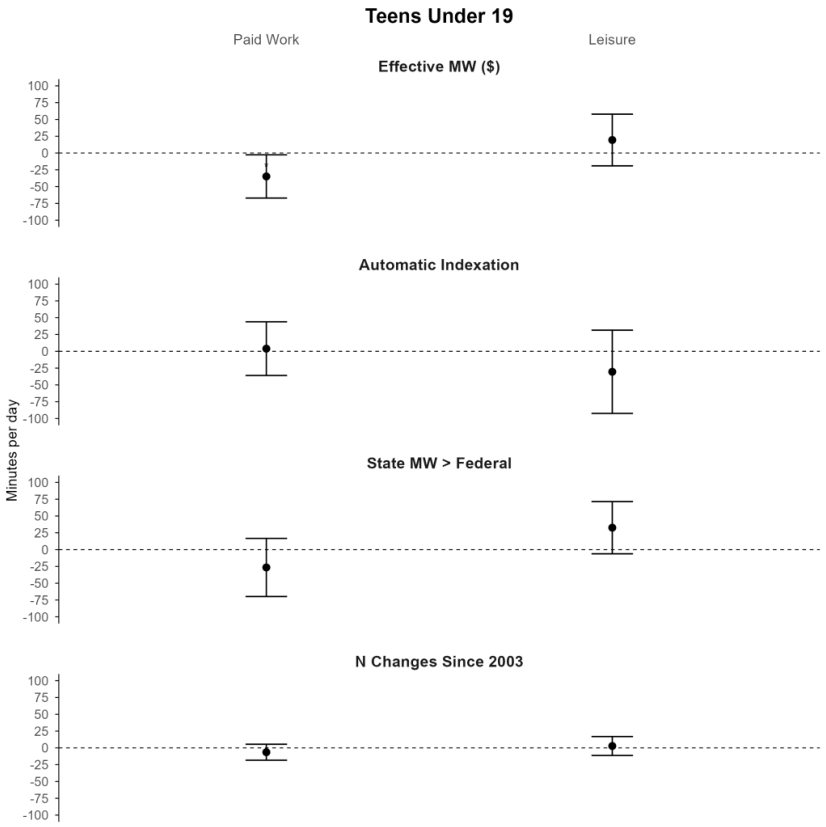


Notes: Figure presents estimated coefficients from models with no control variables. N is 108367 for the full sample, 54873 for women, 32720 for low-education individuals, and 58403 for parents. Data source: (U.S. Bureau of Labor Statistics, 2019).

Teen Subsample

I additionally explored heterogeneity for teenagers, another subgroup that could be impacted by minimum wage more. However, the teen subsample is too small to support reliable inference in this setting. The teen sample contains only 1,529 observations distributed across 17 survey years, resulting in limited within-state variation and highly imprecise estimates.

Figure A2. Effects of Minimum Wage Policies on Paid Work and Leisure - Teens



Notes: Figure compares estimated effects of minimum wage policy on paid work and leisure among teens. Estimates are derived from separate two-way fixed effects regressions. N is 1528. Data source: (U.S. Bureau of Labor Statistics, 2019)

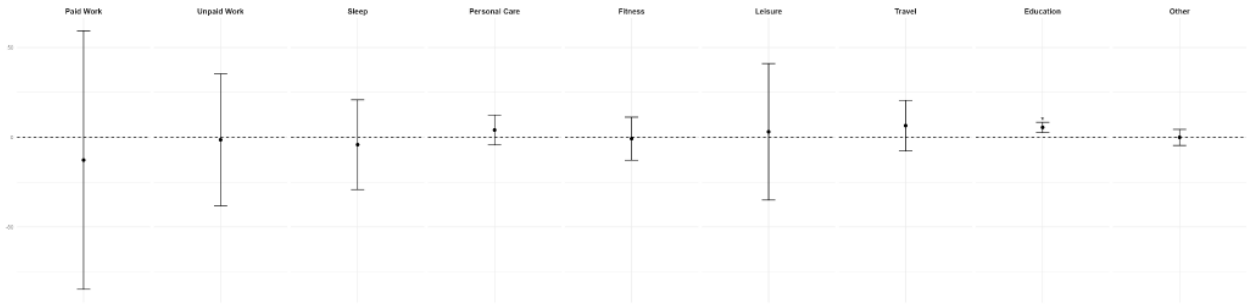
Staggered Difference-in-Differences for Automatic Indexation Adoption

As a robustness check to the TWFE results, I estimate a staggered difference-in-differences (DiD) model focusing on the adoption of automatic minimum wage indexation, which represents a discrete institutional change with a clear adoption year. The staggered DiD estimates yield a qualitatively similar pattern to the TWFE findings, and the adoption of indexation is associated with reduced paid work time and increased leisure time. This is consistent with earlier findings that modest reallocation away from market work toward discretionary activities.

Given the small number of adopting states during the study period, the staggered DiD models are estimated with a reduced set of controls including age, sex, highest educational attainment,

and marital status, to preserve statistical power while maintaining comparability across treated and control groups. The staggered DiD analysis is therefore presented as a robustness exercise rather than the primary empirical specification.

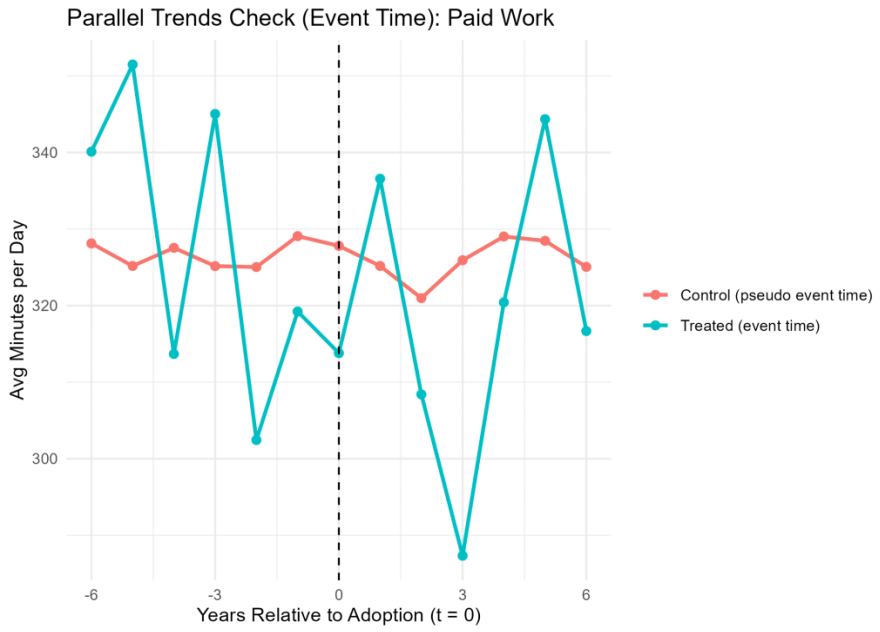
Figure A3. Effects of Automatic Indexation on Time Use: Staggered Difference-in-Differences Estimates



Notes: Staggered DiD estimates of automatic indexation. N = 108367. Data source: (U.S. Bureau of Labor Statistics, 2019).

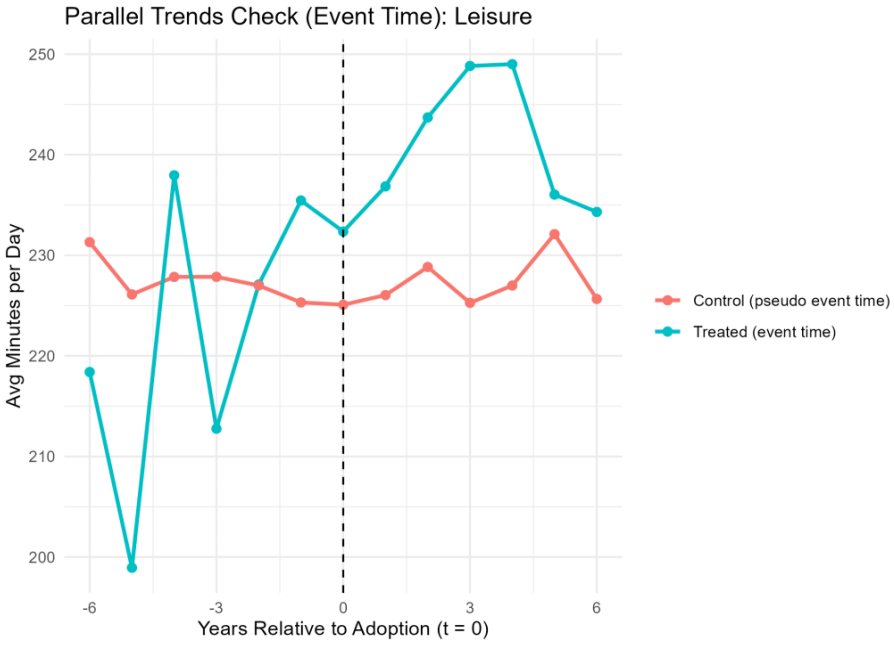
To assess the plausibility of the DiD identifying assumption, I examine pre-adoption outcome dynamics using event-time plots for paid work and leisure. These figures compare adopting states aligned by years relative to adoption (t=0t=0t=0) to a pseudo-control series constructed from non-adopting states weighted to match the adoption-year distribution of treated states. In the pre-adoption period, treated and control series follow broadly similar trajectories for both outcomes. While the treated series is more volatile, there is no evidence of systematic divergence prior to adoption. Overall, these patterns provide suggestive support for the parallel trends assumption underlying the staggered DiD specification, though inference should be interpreted cautiously given the small treatment group.

Figure A4. Event-Study Estimates for Paid Work Around Indexation Adoption



Notes: Event-time estimates relative to indexation adoption (t = 0; reference = t−1).

Figure A5. Event-Study Estimates for Leisure Around Indexation Adoption



Notes: Event-time estimates relative to indexation adoption (t = 0; reference = t−1).