

Internet Appendix

Insufficient Sleep and Intra-Day Financial Decision-Making

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This appendix provides supplemental materials that support the manuscript “Insufficient Sleep and Intra-Day Financial Decision-Making”

Figure IA1. Time of Waking

This figure reports the density of waking times of respondents of the ATUS. The numbers of respondents who report waking at a particular hour peaks around approximately 6 a.m.

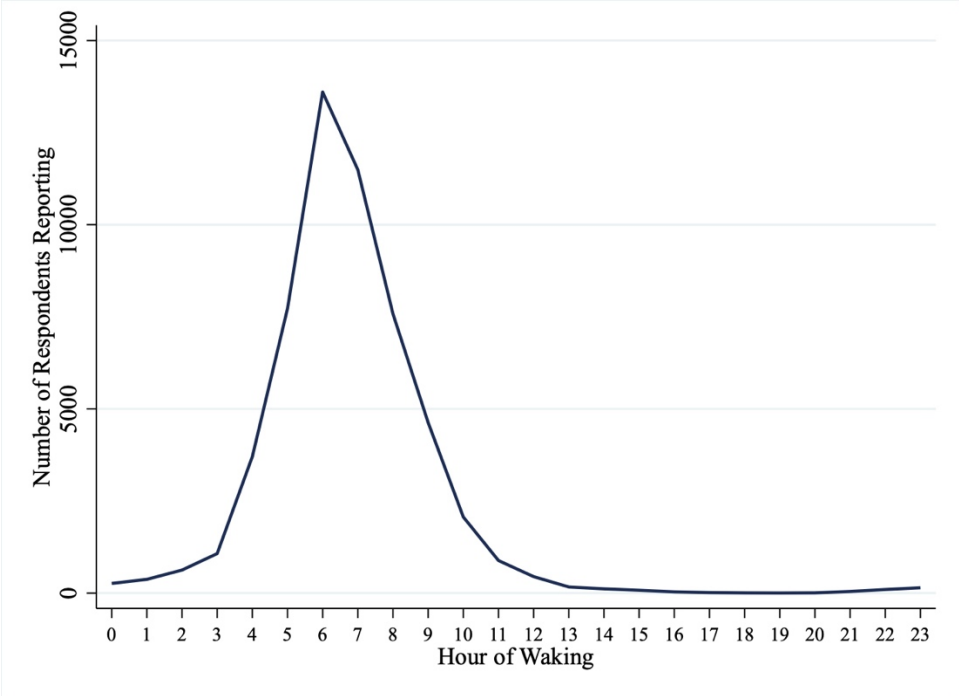


Figure IA2. Loan Applications (Observations) by Time of Day

This figure reports the number of loan-level observations by time of day. Red lines denote the period between 5-10 a.m. which serves as the primary morning widow in the baseline empirical analysis. The number of loans applied for is at a maximum around approximately 10 a.m., and at a minimum around approximately 2 a.m. Weekend loan observations are excluded.

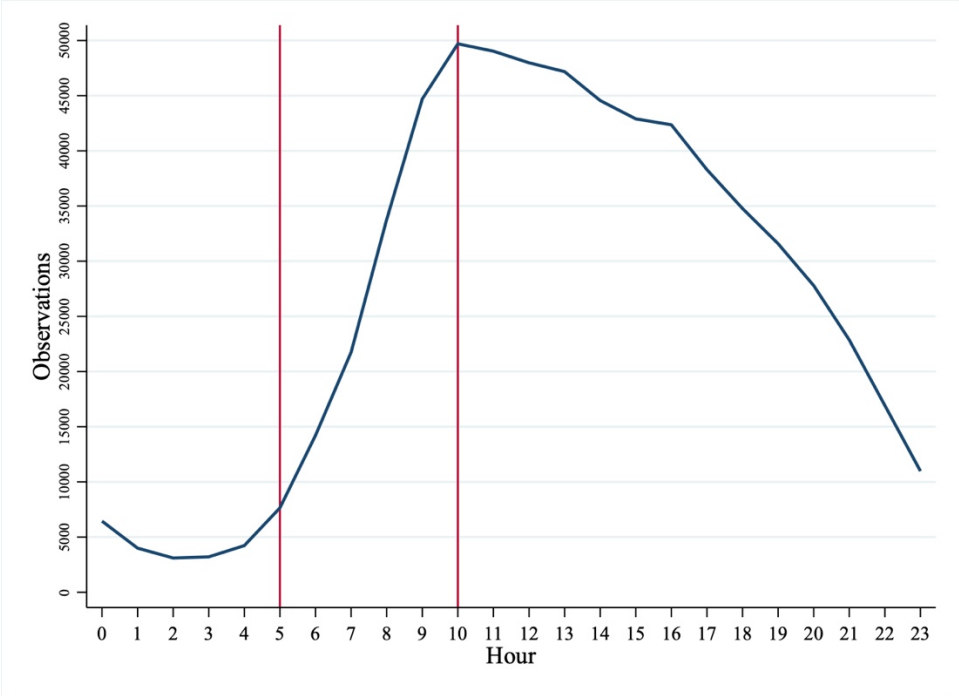
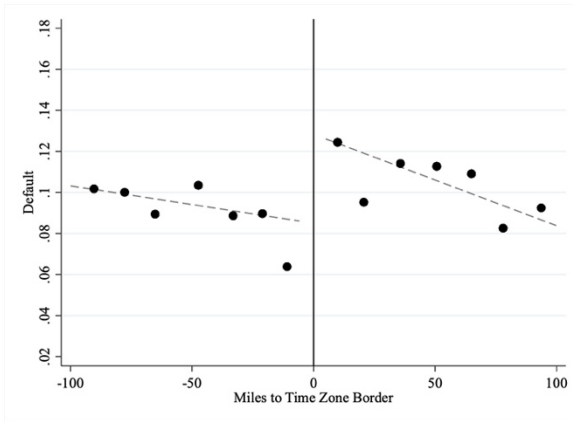


Figure IA3. Discontinuities in Default Probability for the Financially Constrained

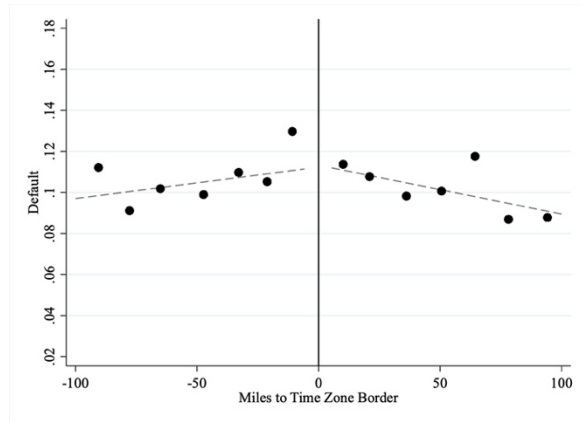
This figure reports the probability of a loan being defaulting around a time zone border threshold at different times of the day. In each panel, the x-axis presents the running variable *Miles to TZ Border*, with a bandwidth of 100 miles around the cutoff. *Low Income* represents the sample below the median income bin (*Income*). *Low Credit Score* represents the sample below the median *Risk Score* value. In Panel A, the y-axis corresponds to the probability of the loan being defaulted (*Default*) at different times of day for the low-income group. In Panel B, the y-axis corresponds to the probability of the loan being defaulted (*Default*) at different times of day for the low-creditworthiness group. Values along the y-axis are shown in seven equal bins on either side of the threshold. The dashed lines represent the fitted values of a first-degree polynomial.

Panel A: Low Income

Morning (5-10 a.m.)

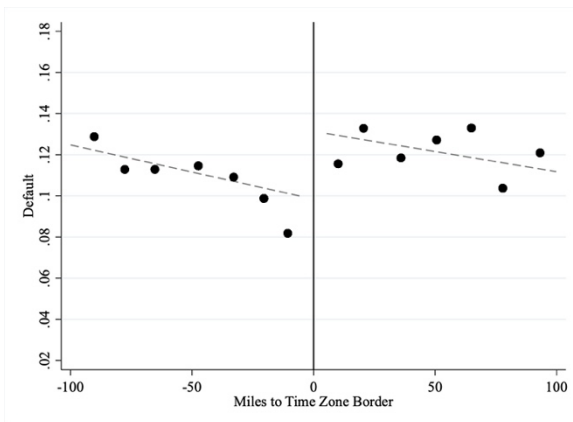


Afternoon and Evening (4-9 p.m.)



Panel B: Low Credit Score

Morning (5-10 a.m.)



Afternoon and Evening (4-9 p.m.)

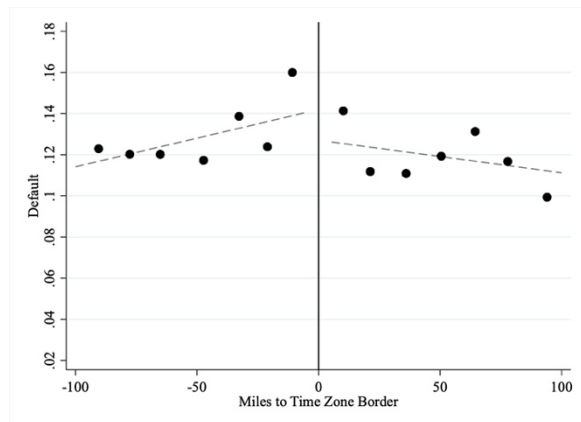
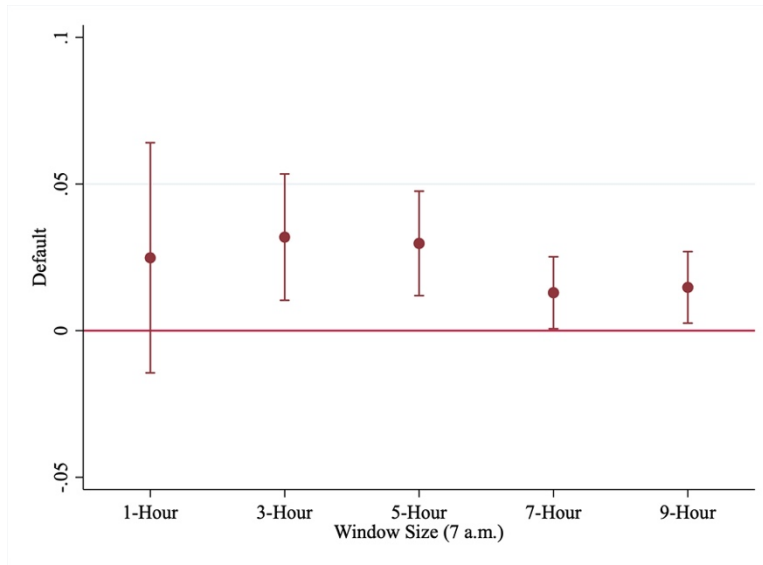


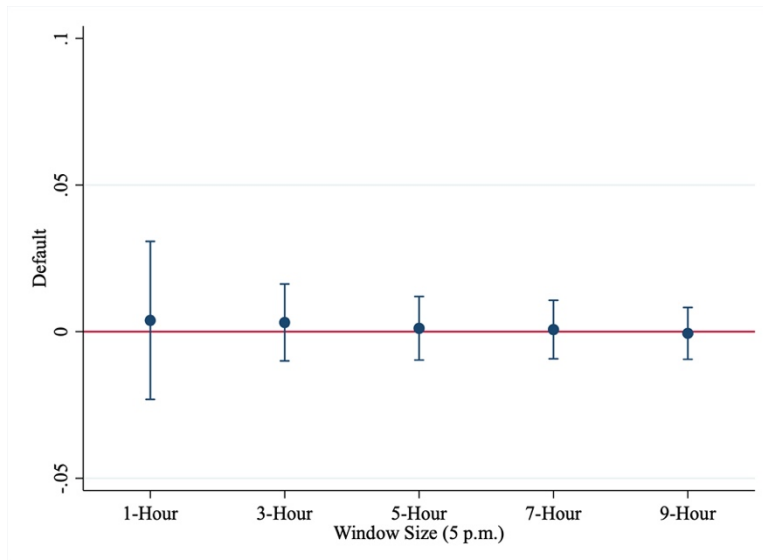
Figure IA4. Window Sizes

This figure displays the effect of sleep loss on loan outcomes throughout the day using a variety of window sizes for the time-of-day subsamples. Panels A and B reports the coefficient values of *LS* (sleep loss instrument) on *Default* for window sizes centered around 7 a.m. or 5 p.m., consistent with Table 3. Panels C and D reports the coefficient values of *Spring Shift* on *Default* for window sizes centered around 7 a.m. or 5 p.m., consistent with Table 9. In all panels, each x-axis tick corresponds to a regression run for a window centered around the displayed time. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variables are *LS* and *Spring Shift* in Panels A and B, respectively. *LS* is an indicator for whether the respondent falls on the late sunset side of a time zone border. In Panels C and D, *Spring Shift* is defined as the four-day window following the spring daylight savings shift. The vertical lines represent the 90% confidence intervals.

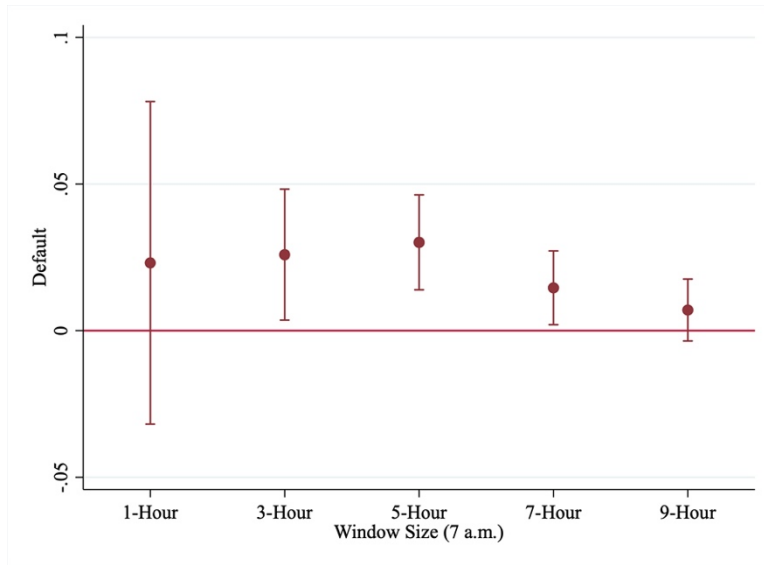
Panel A: Morning Window Sizes (Spatial RDD)



Panel B: Evening Window Sizes (Spatial RDD)



Panel C: Morning Window Sizes (Daylight Savings Shifts)



Panel D: Evening Window Sizes (Daylight Savings Shifts)

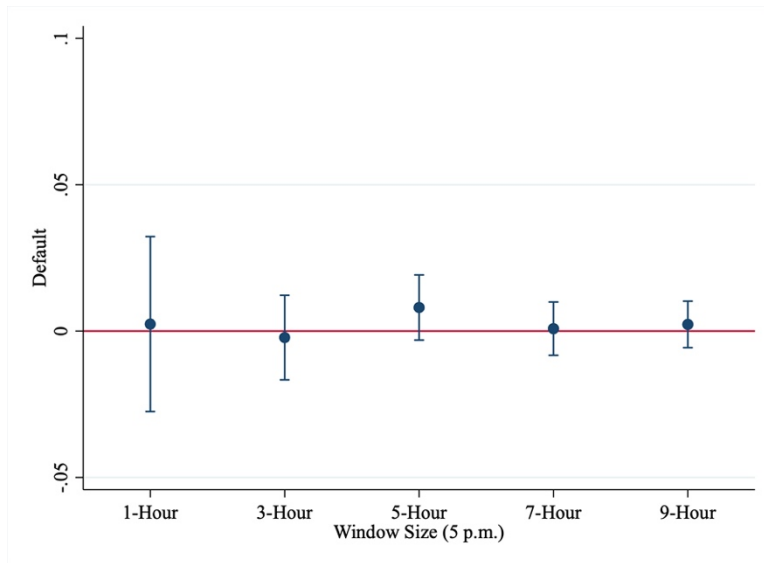


Table IA.1: Alternative Measure of Loan Risk

This table reports the effect of the sleep instrument (*LS*) on loan distress at different times of the day using an alternative measure. The alternative measure and main outcome variable is *Bad Loan* from Butler, Cornaggia, and Gurun (2017), an indicator variable equal to one if the borrower's loan defaults, is charged-off, or has late payments made on it. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.
Dependent Variable:			
Bad Loan			
LS	0.0305*** (2.6225)	0.0302*** (2.5915)	0.0065 (0.7221)
Controls	No	Yes	Yes
Latitude	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes
State	Yes	Yes	Yes
Year	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes
Loan Purpose	No	Yes	Yes
Term	No	Yes	Yes
Bandwidth	400	400	400
Observations	70517	70517	114046
R-squared	0.0289	0.0631	0.0600

Table IA.2: Different Sizes of *Commuting Zone*

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day using an array of *Commuting Zone* sizes. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS* \times *Miles to TZ Border*. Fixed effects are included where indicated. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.
Commuting Zone Size:	10 miles	20 miles	40 miles	50 miles	75 miles	100 miles
Dependent Variable: Default						
LS	0.0267** (2.4519)	0.0248** (2.2316)	0.0291** (2.2372)	0.0445*** (3.4422)	0.0323** (2.1582)	0.0284 (1.4539)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Latitude	Yes	Yes	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes	Yes	Yes
Commuting Zone Bandwidth	Yes 400	Yes 400	Yes 400	Yes 400	Yes 400	Yes 400
Observations	87139	82761	79855	53113	33819	16487
R-squared	0.0553	0.0560	0.0567	0.0558	0.0569	0.0647

Table IA.3: Alternative Daylight Savings Windows

This table corresponds to the effect gains or losses in sleep from daylight savings time shifts on loan default at different times of the day. The main outcome variables are indicators for one-, two-, and three-day windows following the spring daylight savings shift. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered at the borrower level. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Time of Day: 5-10 a.m.						
Dependent Variable:						
Default						
Spring Shift (1 day)	0.0584* (1.8612)	0.0573* (1.8698)				
Spring Shift (2 days)			0.0348** (2.0876)	0.0358** (2.1804)		
Spring Shift (3 days)					0.0236** (2.0590)	0.0230** (2.0282)
Controls	No	Yes	No	Yes	No	No
City × Year	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes	Yes	Yes
Observations	118861	118861	118861	118861	118861	118861
R-squared	0.2003	0.2163	0.2003	0.2163	0.2003	0.2163

Table IA.4: Continuous Measures of Sleep and Wake Times

This table reports the effect of a late sunset time on continuous measures of sleep and wake time using data from the Census' American Time Use Survey (ATUS). In Column 1, the outcome variable is *Bedtime*, a continuous variable representing the respondent's hour of bedtime. In Column 2, the outcome variable is *Wake Time*, a continuous variable equal to the hour of the respondent's waking time. The explanatory variable is *LS*, an indicator for whether the respondent falls on the late sunset side of a time zone border. Controls include *Married*, *Gender*, *Children*, *College*, and *Income*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times Miles\ to\ TZ\ Border$. Fixed effects are included where indicated. Weekends are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
	Bedtime	Wake Time
LS	0.4357*** (3.2333)	-0.2117 (-0.8898)
Controls	Yes	Yes
Latitude	Yes	Yes
Time Zone Border	Yes	Yes
State	Yes	Yes
Year	Yes	Yes
Day-of-Week	Yes	Yes
Bandwidth	400	400
Observations	12992	12992
R-squared	0.0451	0.0834

Table IA.5: Discontinuities in Demographic Characteristics

This table tests for discontinuities in ATUS survey respondent characteristics across time zone borders. The outcome variables are the respondent characteristics which are defined Appendix I. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times Miles\ to\ TZ\ Border$. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Fixed effects are included where indicated. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Black	Married	Male	Children	Income	Age
LS	0.0269 (0.7875)	0.0093 (0.2322)	-0.0324 (-1.2665)	-0.0775 (-0.8790)	2327.3001 (0.2207)	-1.7944 (-1.3168)
Latitude	Yes	Yes	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes
Commuting Zone	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth	400	400	400	400	400	100
Observations	18553	18553	18553	18553	12780	18553
R-squared	0.0955	0.0257	0.0107	0.0317	0.0797	0.0133

Table IA.6: Daylight Savings Time Noncompliers

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day including DST noncompliers. The main outcome variable is *Default*, an indicator variable equal to one if the borrower’s loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS* × *Miles to TZ Border*. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. *States* indicates which of the DST noncompliers is included/excluded in the sample of 48 contiguous states. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.
States:	All But Arizona	All But Indiana	All
Dependent Variable:			
Default			
LS	0.0238** (2.0113)	0.0335*** (2.7791)	0.0252** (2.1278)
Controls	Yes	Yes	Yes
Latitude	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes
State	Yes	Yes	Yes
Year	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes
Term	Yes	Yes	Yes
Commuting Zone	Yes	Yes	Yes
Bandwidth	400	400	400
Observations	70356	71535	72748
R-squared	0.0564	0.0561	0.0562

Table IA.7: Sleep Loss and Loan Outcomes by Loan Purpose

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day by loan purpose. The main outcome variable is *Default*, an indicator variable equal to one if the borrower’s loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. *Consumption* refers to all loans unrelated to debt consolidation. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)
	Consumption	Debt Consolidation
Time of Day:	5-10 a.m.	5-10 a.m.
Dependent Variable: Default		
LS	0.0372** (2.0350)	0.0264** (2.1987)
Controls	Yes	Yes
Latitude	Yes	Yes
Time Zone Border	Yes	Yes
State	Yes	Yes
Year	Yes	Yes
Day-of-Week	Yes	Yes
Loan Purpose	Yes	Yes
Term	Yes	Yes
Commuting Zone	No	No
Bandwidth	400	400
Observations	19988	50529
R-squared	0.0642	0.0546

Table IA.8: Determinants of Default

The purpose of this table is to illustrate the association between various loan and borrower characteristics and loan outcomes. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variables are a variety of loan and borrower characteristics. Fixed effects are included where indicated. Standard errors are clustered at the individual level. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:					
Default					
ln(Monthly Income)	-0.0260*** (-39.7268)				
Risk Score		-0.0126*** (-90.4409)			
First-Time Borrower			0.0258*** (34.6262)		
ln(Loan Size)				0.0075*** (15.2664)	
60 Month Term					0.0345*** (46.1153)
City × Year	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes
Observations	754057	754711	754711	754711	754711
R-squared	0.1086	0.1176	0.1082	0.1070	0.1098

Table IA.9: Sleep Loss and Loan Outcomes (Holidays and Weekends)

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day during holidays and weekends. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS* \times *Miles to TZ Border*. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.	4-9 p.m.
Dependent Variable:				
Default				
LS	-0.0481** (-2.3525)	-0.0504** (-2.0399)	-0.0112 (-0.7849)	-0.0178 (-1.0804)
Controls	Yes	Yes	Yes	Yes
Latitude	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes
Commuting Zone	No	Yes	No	Yes
Bandwidth	400	400	400	400
Observations	16519	16180	25900	25341
R-squared	0.0589	0.0585	0.0556	0.0555

Table IA.10: Alternative Bandwidths and Polynomials (Commuting Zone)

This table reports the effect of the sleep instrument (*LS*) on loan default at various bandwidths around the geographic threshold with the excluded commuting zone. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS* × *Miles to TZ Border*. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Column 7 reports a specification using a second-degree polynomial. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable: Default							2 nd Degree Polynomial
LS	0.0276** (2.4685)	0.0273** (2.4296)	0.0295*** (2.5948)	0.0332** (2.4660)	0.0348** (2.3209)	0.0721** (2.4561)	0.0366** (2.3818)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Latitude	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commuting Zone	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth	700	600	500	300	200	100	400
Observations	85765	81387	78481	51739	32446	15113	69143
R-squared	0.0554	0.0562	0.0568	0.0559	0.0569	0.0655	0.0562

Table IA.11: Sleep Loss and Loan Outcomes (Alternate Fixed Effects)

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day using an alternate set of fixed effects. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Employment* and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS* \times *Miles to TZ Border*. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.	4-9 p.m.
Dependent Variable:				
Default				
LS	0.0298*** (2.7535)	0.0322*** (2.6668)	-0.0055 (-0.7879)	-0.0061 (-0.7739)
Controls	Yes	Yes	Yes	Yes
Latitude	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes
Loan Size (10k bins)	Yes	Yes	Yes	Yes
Income Range	Yes	Yes	Yes	Yes
Risk Score	Yes	Yes	Yes	Yes
Commuting Zone	No	Yes	No	Yes
Bandwidth	400	400	400	400
Observations	70517	69143	114045	111635
R-squared	0.0566	0.0567	0.0560	0.0561

Table IA.12: Daylight Savings Time Shifts and Loan Outcomes (Alternate Fixed Effects)

This table reports to the of spring daylight savings time shifts on loan outcomes using an alternate set of fixed effects. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The main explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. Also included as an explanatory variable is *Autumn Shift*, defined as the four-day window following the autumn daylight savings shift. Controls include: *Employment* and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered by individual. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.	4-9 p.m..
Dependent Variable:				
Default				
Spring Shift	0.0292*** (2.9478)	0.0305*** (3.1036)	-0.0010 (-0.1546)	-0.0013 (-0.1885)
Controls	No	Yes	No	No
City × Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	No	Yes	No	Yes
Term	No	Yes	No	Yes
Loan Size (10k bins)	Yes	Yes	Yes	Yes
Income Range	Yes	Yes	Yes	Yes
Risk Score	Yes	Yes	Yes	Yes
Observations	118861	118861	176554	176554
R-squared	0.2125	0.2168	0.1794	0.1846

Table IA.13: Borrower Relocation and Individual Fixed Effects (State Relocation)

This table reports the effect of the sleep instrument (*LS*) on loan default for borrowers who relocate around time zone boundaries *within the same state*, allowing for the application of individual fixed effects. The main outcome variable is *Default*, an indicator variable equal to one if the borrower’s loan defaults or is charged-off. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS × Miles to TZ Border*. Fixed effects are included where indicated. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)	(4)	(5)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.	4-9 p.m.
Dependent Variable:					
Default					
LS	0.0572* (1.6543)	0.0675* (1.8219)	0.1475* (1.7963)	0.1642* (1.9469)	0.0075 (0.1030)
Controls	No	Yes	No	Yes	Yes
Individual	Yes	Yes	No	No	No
Individual×State	No	No	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes
Loan Purpose	No	Yes	No	Yes	Yes
Term	No	Yes	No	Yes	Yes
Bandwidth	400	400	400	400	400
Observations	7298	7298	7142	7142	11282
R-squared	0.7169	0.7199	0.7182	0.7214	0.6954

Table IA.14: Pricing (Individual Fixed Effects)

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day, exploiting within-individual variation in financial behavior. The outcome variable is *Interest Rate*, defined as the interest rate on the borrower's loan. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and *LS × Miles to TZ Border*. Fixed effects are included where indicated. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.	4-9 p.m.
Dependent Variable:				
Interest Rate				
LS	0.0062 (0.3163)	0.0071 (0.4382)	0.0054 (0.3216)	0.0082 (1.0222)
Controls	No	No	Yes	Yes
Individual	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	No	Yes	Yes	Yes
Term	No	Yes	Yes	Yes
Bandwidth	400	400	400	400
Observations	7298	7298	7298	11660
R-squared	0.6929	0.8220	0.8431	0.8413

Table IA.15: Loan Supply (Sunset Time)

This table reports the effect of the sleep on the probability of funding. The main outcome variable is *Funded*, defined as an indicator variable equal to one if a listing is funded. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, $\ln(\text{Listing Size})$, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.
Dependent Variable:			
Funded			
LS	0.0073 (0.6942)	0.0081 (0.7773)	0.0004 (0.0417)
Controls	No	Yes	Yes
Latitude	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes
State	Yes	Yes	Yes
Year	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes
Loan Purpose	No	Yes	Yes
Term	No	Yes	Yes
Bandwidth	400	400	400
Observations	158746	158746	275378
R-squared	0.1203	0.1338	0.1295

Table IA.16: Time of Day and Default

The purpose of this table is to illustrate the association between various time-of-day and loan outcomes. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The explanatory variables are *Morning* (an indicator if a loan application is completed between 5-10 a.m.), *Evening* (an indicator if a loan application is completed between 4-9 p.m.), and *Hour of Day* (a 1-24 measure of the hourly time an application is filled out). Fixed effects are included where indicated. Standard errors are clustered at the individual level. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: Default						
Morning	0.0021* (1.6485)	0.0022* (1.7655)				
Evening			-0.0002 (-0.1687)	-0.0003 (-0.2722)		
Hour of Day					-0.0002* (-1.7814)	-0.0002* (-1.8759)
Controls	No	Yes	No	Yes	No	Yes
Individual	Yes	Yes	Yes	Yes	Yes	Yes
City × Year	Yes	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226922	226922	226922	226922	226922	226922
R-squared	0.7632	0.7640	0.7632	0.7639	0.7632	0.7640

Table IA.17: Daylights Savings Time Shifts and Loan Pricing

This table reports to the of spring daylight savings time shifts on loan pricing at different times of the day. The outcome variable is *Interest Rate*, defined as the interest rate on the borrower's loan. The main explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered by individual. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(6)	(7)
Time of Day:	5-10 a.m.	5-10 a.m.
	Interest Rate	Interest Rate
Spring Shift	-0.0008 (-0.4051)	-0.0010 (-0.8152)
Controls	No	Yes
City × Year	Yes	Yes
Day-of-Week	Yes	Yes
Loan Purpose	Yes	Yes
Term	Yes	Yes
Observations	118861	118861
R-squared	0.2279	0.6888

Table IA.18: Daylights Savings Time Shifts (Income and Creditworthiness)

This table reports to the of spring daylight savings time shifts on loan default at different times of the day. The main outcome variable is *Default*, an indicator variable equal to one if the borrower’s loan defaults or is charged-off. The main explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. *Low Income* and *High Income* represent samples above and below the median income bin (*Income*), respectively. *Low Credit Score* and *High Credit Score* represent samples above and below the median *Risk Score* value, respectively. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered by individual. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.
Dependent Variable:				
Default				
	Low Income	High Income	Low Credit Score	High Credit Score
Spring Shift	0.0390** (2.5555)	0.0047 (0.3319)	0.0284 (1.5749)	0.0252** (2.0778)
Controls	Yes	Yes	Yes	Yes
City × Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes
Observations	57301	49834	47559	59196
R-squared	0.2647	0.2552	0.2729	0.2408

Table IA.19: Loan Supply (Daylight Savings Time)

This table reports the effect of the sleep on the probability of funding. The main outcome variable is *Funded*, defined as an indicator variable equal to one if a listing is funded. The explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. Controls include: *Risk Score*, *Income*, $\ln(\text{Listing Size})$, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered at the borrower level. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.
Dependent Variable:			
Funded			
Spring Shift	-0.0128 (-1.4267)	-0.0104 (-1.1747)	-0.0081 (-1.2867)
Controls	No	Yes	Yes
City × Year	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes
Loan Purpose	No	Yes	Yes
Term	No	Yes	Yes
Observations	303918	303918	468604
R-squared	0.2715	0.2815	0.2403

Table IA.20: Schedule Flexibility

This table reports the effect of having an inflexible schedule on the probability of taking out a loan in the morning. The main outcome variable is *Morning Loan*, an indicator variable equal to one if the loan application was done between the hours of 5-10 a.m. The explanatory variables are *Inflexible Schedule*, a variable equal to one if the borrower reports being employed but not self-employed, and *Flexible Schedule*, a variable equal to one if the borrower reports being self-employed. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Weekend loans are excluded. Standard errors are clustered at borrower level. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Dependent Variable: Morning Loan				
Inflexible Schedule	0.0100*** (5.0555)	0.0146*** (7.2490)		
Flexible Schedule			-0.0091*** (-4.0739)	-0.0135*** (-5.9798)
Controls	No	Yes	No	Yes
Occupation	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	No	Yes	No	Yes
Term	No	Yes	No	Yes
Observations	520419	520419	520419	520419
R-squared	0.0070	0.0094	0.0070	0.0094

Table IA.21: Within-Individual Heuristic Thinking

This table reports the effect of two different instruments for sleep loss on loan heuristics at different times of the day with individual fixed effects. The main outcome variable is *Heuristic Index*, defined as an index between 0-5 for whether a loan is rounded to the nearest 1000, 5000, 10000, 15000, or 20000 (following Pursiainen, 2024). In Panel A, the explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. In Panel B, explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. In Panel A, controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*, while Panel A includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. In Panel A, weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border) in Panel A and at the borrower level in Panel B. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

Panel A: Sunset Time (Spatial RDD)

	(1)	(2)	(3)
Time of Day:	5-10 a.m.	5-10 a.m.	4-9 p.m.
Dependent Variable:			
Heuristic Index			
LS	1.0815** (2.1051)	1.0878** (2.1504)	0.0979 (0.3519)
Controls	Yes	Yes	Yes
Individual	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes
Year	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes
Term	Yes	Yes	Yes
Bandwidth	400	400	400
Observations	7298	7298	11660
R-squared	0.5759	0.5782	0.5859

Panel B: Sunset Time (Spatial RDD)

	(1)	(2)
Time of Day:	5-10 a.m.	Full Day
Dependent Variable: Heuristic Index		
Spring Shift	0.0398 (0.1467)	0.0761** (2.1968)
Controls	Yes	Yes
Individual	Yes	Yes
City × Year	Yes	Yes
Day-of-Week	Yes	Yes
Loan Purpose	Yes	Yes
Term	Yes	Yes
Observations	5879	216006
R-squared	0.7762	0.6509

Table IA.22: Sleep Loss and Withdrawals (Sunset Time)

This table reports the effect of the sleep instrument (*LS*) on listing withdrawals. The main outcome variable is *Withdrawn*, an indicator variable equal to one if the borrower withdraws their loan application (listing) before it is funded. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
Time of Day:	5-10 a.m.	4-9 p.m.
Dependent Variable: Withdrawn		
LS	-0.0043 (-1.0269)	0.0041 (1.2403)
Controls	Yes	Yes
Latitude	Yes	Yes
Time Zone Border	Yes	Yes
State	Yes	Yes
Year	Yes	Yes
Day-of-Week	Yes	Yes
Loan Purpose	Yes	Yes
Term	Yes	Yes
Commuting Zone	Yes	Yes
Bandwidth	400	400
Observations	158746	275378
R-squared	0.2166	0.2266

Table IA.23: Daylight Savings Time Shifts and Withdrawals

This table reports the effect of daylight savings time shifts on listing withdrawals. The main outcome variable is *Withdrawn*, an indicator variable equal to one if the borrower withdraws their loan application (listing) before it is funded. The main explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered by individual. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)
Time of Day:	5-10 a.m.	4-9 p.m.
Dependent Variable:		
Withdrawn		
Spring Shift	-0.0054* (-1.9588)	-0.0001 (-0.0229)
Controls	Yes	Yes
City \times Year	Yes	Yes
Loan Purpose	Yes	Yes
Term	Yes	Yes
Observations	303918	468604
R-squared	0.5388	0.4787

Table IA.24: Sleep Loss and Rounding Indicators (Sunset Time)

This table reports the effect of the sleep instrument (*LS*) on heuristic thinking at different times of the day during holidays and weekends. The main outcome variables are indicators for whether a loan is rounded to \$5000 or \$10000. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.
	Rounded 5k	Rounded 5k	Rounded 10k	Rounded 10k
LS	0.0166 (1.1963)	0.0182 (1.1107)	0.0167 (1.4151)	0.0237* (1.8270)
Controls	Yes	Yes	Yes	Yes
Latitude	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes
Commuting Zone	No	Yes	No	Yes
Bandwidth	400	400	400	400
Observations	70517	69143	70517	69143
R-squared	0.1713	0.1717	0.0670	0.0670

Table IA.25: Daylight Savings Time Shifts and Rounding Indicators

This table reports to the of spring daylight savings time shifts on heuristic thinking at different times of the day. The main outcome variables are indicators for whether a loan is rounded to \$5000 or \$10000. The main explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. Also included as an explanatory variable is *Autumn Shift*, defined as the four-day window following the autumn daylight savings shift. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered by individual. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)	(4)
Time of Day:	5-10 a.m.	5-10 a.m.	5-10 a.m.	5-10 a.m.
	Nearest 5k	Nearest 5k	Nearest 10k	Nearest 10k
Spring Shift	0.0351** (2.1590)	0.0255* (1.7311)	0.0149 (1.2222)	0.0103 (0.8694)
Controls	No	Yes	No	No
City \times Year	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes
Loan Purpose	No	Yes	No	Yes
Term	No	Yes	No	Yes
Observations	118861	118861	118861	118861
R-squared	0.1882	0.3200	0.1832	0.2306

Table IA.26: Sleep Loss and Loan Size

This table reports the effect of the sleep instrument (*LS*) on loan default at different times of the day. The main outcome variable is $\ln(\text{Loan Size})$. In Panel A, the explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. In Panel B, The main explanatory variable is *Spring Shift*, defined as the four-day window following the spring daylight savings shift. Controls include: *Risk Score*, *Income*, *Employment*, and *Prior Loans*. In Panel A, each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. Fixed effects are included where indicated. In Panel A, *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border) in Panel A, and at the individual level in Panel B. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

Panel A: Sunset Time

	(1)	(2)	(3)	(4)	(5)
Time of Day:	Full Day	5-10 a.m.	5-10 a.m.	4-9 p.m.	4-9 p.m.
Dependent Variable:					
$\ln(\text{Loan Size})$					
LS	0.0264** (2.4321)	0.0364 (1.0699)	0.0140 (0.6136)	0.0283 (1.1123)	0.0268* (1.6661)
Controls	Yes	Yes	Yes	Yes	Yes
Latitude	Yes	Yes	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes	Yes	Yes
State	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes	Yes
Commuting Zone	Yes	Yes	Yes	Yes	Yes
Bandwidth	400	400	400	400	400
Observations	402093	69143	69143	111636	111636
R-squared	0.3213	0.0447	0.3063	0.0460	0.3286

Panel B: Daylight Savings Time

	(1)	(2)	(3)	(4)	(5)
Time of Day:	Full Day	5-10 a.m.	5-10 a.m.	4-9 p.m.	4-9 p.m.
Dependent Variable: ln(Loan Size)					
Spring Shift	0.0248*** (3.4998)	0.0390* (1.7152)	0.0440** (2.2462)	0.0184 (1.1012)	0.0265* (1.8992)
Controls	Yes	No	Yes	No	Yes
City × Year	Yes	Yes	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes	Yes	Yes
Term	Yes	Yes	Yes	Yes	Yes
Observations	721526	118861	118861	176555	176555
R-squared	0.3704	0.2102	0.4216	0.1800	0.4182

Table IA.27: Sleep Loss and Application Volume (Sunset Time)

This table reports the county-level effect of the sleep instrument (*LS*) on loan application volumes. The main outcome variable is *Total Applications*, a variable equal to the number of loan applications per county over the sample period. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times Miles\ to\ TZ\ Border$. Fixed effects are included where indicated. In this county-level specification, *Latitude* indicates a five-degree latitude band fixed-effect. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. The unit of observation is the county-level. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

Model: Poisson	(1)	(2)
Dependent Variable: Total Applications		
LS	0.1477** (2.2180)	0.1730** (2.2627)
Latitude	Yes	Yes
Time Zone Border	Yes	Yes
State	Yes	Yes
Population Control	Yes	Yes
Commuting Zone	No	Yes
Bandwidth	400	400
Observations	2496	2294
Pseudo R ²	0.9516	0.9505

Table IA.28: Daylight Savings and Application Volume

This table reports the effect of the of spring and autumn daylight savings time shifts on weekly loan application volume. The main outcome variable is *Total Applications*, a variable equal to the number of loan applications per week. The main explanatory variable is *Week Spring Shift*, defined as an indicator equal to the week of the spring daylight savings shift. Also included as an explanatory variable is *Week Autumn Shift*, defined as an indicator equal to the week of the autumn daylight savings shift. Fixed effects are included where indicated. The unit of analysis is the week level. Standard errors are clustered by week. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

Model: Poisson	(1)	(2)
Dependent Variable: Total Applications		
Week Spring Shift	0.1583*** (2.5915)	
Week Autumn Shift		-0.1480* (-1.6969)
Month-Year	Yes	Yes
Observations	953	953
Pseudo R ²	0.7524	0.7523

Table IA.29: Aggregate Debt Levels (Experian Sample)

This table reports the effect of the sleep instrument (*LS*) on the overall monthly debt levels of loan applicants. The main outcome variable is *Monthly Debt*, a variable equal to the monthly debt obligations (in thousands) of the borrower as reported in their credit report. The explanatory variable of interest and the instrument for sleep loss is *LS*, an indicator variable equal to one if the borrower is on the late sunset side of a time zone border. Experian controls include: *Time Since Credit* (the number of years since the individual appeared in credit reports), *Open Credit Lines*, and *Total Inquiries*. Controls include: *Risk Score*, *Income*, $\ln(\text{Loan Size})$, *Employment*, and *Prior Loans*. Each model includes the variable and interaction term *Miles to TZ Border* and $LS \times \text{Miles to TZ Border}$. *Low Income* and *High Income* represent samples above and below the median income bin (*Income*), respectively. Fixed effects are included where indicated. *Commuting Zone* indicates whether a 30-mile commuting zone on either side of the bandwidth is excluded. Weekend loans are excluded. Standard errors are clustered at geographical level (based on the distance from the time zone border). The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively. See Table 1 for sample descriptive characteristics.

	(1)	(2)	(3)
		Low Income	High Income
Dependent Variable: Monthly Debt ('000)			
LS	0.0362** (2.4880)	0.0367*** (2.8656)	0.0279 (0.6906)
Experian Controls	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Latitude	Yes	Yes	Yes
Time Zone Border	Yes	Yes	Yes
State	Yes	Yes	Yes
Year	Yes	Yes	Yes
Day-of-Week	Yes	Yes	Yes
Loan Purpose	Yes	Yes	Yes
Term	Yes	Yes	Yes
Commuting Zone	Yes	Yes	Yes
Bandwidth	400	400	400
Observations	560343	368887	191456
R-squared	0.2449	0.2004	0.1773

Table IA.30: Monthly Debt and Default

This table corresponds to the association between the aggregate monthly debt and loan outcomes. The main outcome variable is *Default*, an indicator variable equal to one if the borrower's loan defaults or is charged-off. The main explanatory variable is *Monthly Debt*, a variable equal to the monthly debt obligations (in thousands) of the borrower as reported in their credit report. Controls include: *Risk Score*, *Income*, *ln(Loan Size)*, *Employment*, and *Prior Loans*. Fixed effects are included where indicated. Standard errors are clustered at the individual-level. The t-statistics are denoted in parenthesis. Statistical significance is indicated by ***, **, and * at the 1%, 5%, and 10% level, respectively.

	(1)
Dependent Variable: Default	
Monthly Debt ('000)	0.0032*** (3.6405)
Controls	Yes
City × Year	Yes
Day-of-Week	Yes
Loan Purpose	Yes
Term	Yes
Observations	215308
R-squared	0.1540