# Unemployment Insurance as a Worker Indiscipline Device? Evidence from Scanner Data

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**ONLINE APPENDIX**

## Appendix 1: Theoretical Model

Although the comparative static of interest is straightforward, and has been previously established in the literature (e.g., Shapiro and Stiglitz, 1984), in this appendix we lay out a simple theoretical model for a worker's choice of effort while on the job. The model makes clear the key assumptions required for an ex ante moral hazard effect of UI to exist, and helps to suggest the types of workers who are expected to respond ex ante to changes in UI benefits.

Consider a worker who chooses effort, $e$, to maximize expected utility:

$$E(U) = (1 - p(e))U(C_e) + p(e)U(C_u) \tag{1}$$

where $p(e)$ is the probability that worker is fired (decreasing in $e$), $C_e$ is consumption while employed, $C_u$ is consumption while unemployed and $U(\cdot)$ is increasing and concave. We make the following additional assumptions:

1. $p''(e) > 0$

2. $C_e = w - e$, where $w$ is the wage

3. $\frac{\partial C_u}{\partial b} > 0$ & $\frac{\partial C_u}{\partial d} > 0$, where $b$ is UI benefit level and $d$ is UI benefit duration

4. $C_e > C_u$

The first order condition is:

$$(1 - p(e))U'(C_e) = -p'(e)(U(C_e) - U(C_u)) \tag{2}$$

where the left-hand side is the marginal cost of an increase in effort and the right-hand side is the marginal

benefit of an increase in effort. The second order condition is:

$$p''(e)(U(C_u) - U(C_e)) + 2p'(e)U'(C_e) + (1 - p(e))U''(C_e) \equiv S(\cdot) \tag{3}$$

Applying the implicit function theorem to the FOC and denoting $e^*$ the optimal effort:

$$\frac{\partial e^*}{\partial C_u} = -\frac{p'(e)U'(C_u)}{S(\cdot)} \tag{4}$$

The assumptions ensure that $S(\cdot)$ and $\frac{\partial e^*}{\partial C_u}$ are negative so that an increase in UI benefits or duration will decrease effort.

An implicit assumption, which clearly holds in the context of supermarket cashiers, is that employers partially observe effort (in order for $\frac{\partial p(e)}{\partial e} < 0$ to hold). Cases in which $p'(e)$ violates the above assumptions can provide some intuition for expected heterogeneity in equation 4. Consider a worker who cannot be fired. This worker has $p(e) = 0$ ($\forall e$) and does not change $e^*$ in response to $\Delta C_u$. A worker with slightly less strong employment protection will have very small $|p'(e)|$ and a weak, but still negative, relationship between $C_u$ and $e$. Although the workers in our setting are unionized, past work with data from this supermarket chain has observed that these workers can be fired if they are perceived as under-performing (see Mas and Moretti, 2009). Assumption (1) implies that there are "decreasing returns" to effort. This seems reasonable in most cases and is necessary for $\frac{\partial e^*}{\partial C_u} < 0$ to *always* hold. $\frac{\partial e^*}{\partial C_u} < 0$ will still often hold with concave $p(e)$, depending on the relative magnitude of the terms in the SOC.

We do not model the optimal $e^*$ from the employer's or social planner's perspective. Therefore, we do not explicitly define shirking and we use the terms "a decrease in effort" and "an increase in shirking" interchangeably. A general equilibrium approach would model the employer's choice of wage offers and it is worth considering whether or not such employer responses affect the partial equilibrium relationships that we estimate. It is at least possible for both employers and customers to foresee changes in worker effort provision in response to UI benefit changes. We investigate these possibilities by looking for changes in cashier characteristics and transaction characteristics in response to PBD changes. Concerns about employer responses are also partially reduced by observations in past work with data from this supermarket chain which suggest that workers are primarily responsible for choosing their own shifts (Mas and Moretti, 2009).

# Appendix 2: Unemployment Insurance Program Extensions in the US

## The Extended Benefits Program

The EB program is state run and has existed since 1970. Under EB, a state's PBD is extended by either 13 or 20 weeks if the state's 13-week average Insured Unemployment Rate (IUR) or 3-month average Total Unemployment Rate (TUR) meet certain threshold, or "trigger," levels. The TUR is simply the ratio of the number of unemployed workers to the total number of workers in the state. The IUR is the ratio of UI claimants to the total number of workers in UI-eligible jobs in the state. All states are required to provide an additional 13 weeks of UI benefits if the IUR is at least $5.0\%$ and at least $120\%$ of the average of the state's IURs for the same 13 week period during the past 2 years. In addition to the this, states decide whether to follow one, both, or neither of the following optional triggers:

1. If the IUR is at least $6.0\%$ (regardless of past IURs) then an additional 13 weeks of benefits are made available. This is known as the "IUR option."

2. If the TUR is at least $6.5\%$ and at least $110\%$ of the same TURs in either of the prior 2 years, then an additional 13 weeks of benefits are made available. Additionally, if the TUR is at least $8\%$ and at least $110\%$ of the same TURs in either of the prior 2 years, then an additional 20 weeks of benefits are made available (for 20 weeks total of EB, not 33). This is known as the "TUR option."

The EB program was originally financed 50% by states and 50% by the federal government. However, starting on February 17, 2009, the American Recovery and Reinvestment Act (ARRA) temporarily made the EB program fully federally financed. This additional federal financing remained in effect through the entirety of our sample. The 2-year "look-back" timeframe present in several of the threshold rules was temporarily changed to a 3-year period in December 2010, and this change also remained in effect throughout the remainder of our sample (Whittaker and Isaacs, 2013; Marinescu, 2017).

## The Emergency Unemployment Compensation Program

The EUC program was enacted by the federal government as a response to the Great Recession and was federally run and funded throughout its existence. First established by the Emergency Unemployment Compensation Act on June 30, 2008, the EUC program originally provided 13 weeks of additional eligibility in all states. The design of the EUC program was changed twice during the Great Recession. On November 21, 2008 the EUC was given a two tier structure, 20 weeks of additional eligibility was provided for all

states in tier 1 and an additional 13 weeks was provided for states with a TUR $\geq 6\%$ or a IUR $\geq 4\%$. On November 6, 2009 the second tier was increased to 14 weeks and given to all states regardless of TUR or IUR, a third tier was created providing 13 weeks to states with TUR $\geq 6\%$ or a IUR $\geq 4\%$, and a fourth tier was created providing 6 weeks to states with TUR $\geq 8.5\%$ or a IUR $\geq 6\%$ (Whittaker and Isaacs, 2014; Marinescu, 2017). The tiers in each of these iterations are cumulative, so that after November 6, 2009 in a state that selected the TUR option for the EB program, the maximum possible PBD available included the original 26 weeks, 20 weeks of EB, 20 weeks of EUCI, 14 weeks of EUCII, 13 weeks of EUCIII, and 6 weeks of EUCIV (for a total of 99 weeks).

As a temporary program EUC was originally given an expiration date of March 28, 2009. Congress extended the program multiple times so that it did not expire indefinitely until well after our sample ends. However, on four separate occasions during our sample (in March, April, June, and November of 2010) Congress failed to extend the program before its previous expiration date so that there were temporary lapses in EUC availability. The first two of these lapses were short (2 and 10 days respectively) while the latter two were relatively long (nearly 2 months).

**The Temporary Extension of Unemployment Compensation Program**

The TEUC program, also federally run and funded, was available to new claimants between March 2002 and December 2003.[1] Benefits continued to be available for existing but unexhausted TEUC claims into early 2004. The TEUC program extended UI benefits for either 13 or 26 weeks, with the additional 13 weeks (second tier) of benefits available in states with an IUR (13 week) of at least 4% and at least 120% higher than in the same time period during the prior two years (Valletta, 2014).

**Additional Detail on Extensions in Scanner Data Sample**

As described briefly in section 3.1, the PBD extensions we exploit for identifying variation occur for one of three reasons: (1) a state's unemployment rate crosses a threshold or "trigger" value currently in place (see first subsection of this appendix for specific unemployment rate and trigger values used), (2) the relevant authority (state government for EB, federal for EUC or TEUC) changes the trigger value to a level below the state's current unemployment rate, or (3) the federal government alters the (EUC or TEUC) program by changing the number of weeks available or allowing the program to expire (either temporarily or permanently). Here we provide additional narrative detail for each of the extensions occurring in our scan-

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[1]Variation in PBD from the TEUC program is only used in our ATUS analyses, since the program does not overlap with our scanner data sample.

ner data sample (ignoring EUC program lapses 4/5/2010-4/14/2010, 6/2/2010-7/21/2010, and 11/30/2010-12/16/2010). The dates and PBD levels for each of these changes are shown in Table 2. Sources for the information provided below are the EB and EUC trigger notices made available online by the US Department of Labor.[2]

1. Washington D.C., 4/12/2009, EB: Number of weeks available through the EB program increases from 0 to 20. This change resulted directly from D.C. adopting the TUR option. The TUR in D.C. exceeded both trigger values (13 week and 20 week) under the TUR option, but was below the IUR trigger value.

2. Maryland, 4/12/2009, EUC: Number of weeks available through the EUC program increases from 20 to 33. This change resulted from MD's TUR crossing the threshold value of 6%. (During this time period the second tier of EUC benefits provided an additional 13 weeks to states with TUR $\geq$ 6% (Isaacs and Whittaker, 2014).)

3. Virginia, 5/3/2009, EB: Number of weeks available through the EB program increases from 0 to 13. This change resulted directly from VA adopting the TUR option. The TUR in VA exceeded the 13 week trigger value under the TUR option, but was below the IUR trigger value and the 20 week TUR trigger value.

4. Virginia, 5/3/2009, EUC: Number of weeks available through the EUC program increases from 20 to 33. This change resulted from VA's TUR crossing the threshold value of 6%. (During this time period the second tier of EUC benefits provided an additional 13 weeks to states with TUR $\geq$ 6% (Isaacs and Whittaker, 2014).

5. Washington D.C., 11/8/2009, EUC: Number of weeks available through the EUC program increases from 33 to 53. This change resulted from a policy change at the federal level which restructured the EUC program, increasing the number of weeks available through the EUC's second tier to 14 (from 13), and creating third (13 weeks), and fourth (6 weeks) tiers. The TUR in D.C. exceeded the threshold value for the third and fourth tiers (Isaacs and Whittaker, 2014).

6. Maryland, 11/8/2009, EUC: Number of weeks available through the EUC program increases from 33 to 47. This change resulted from a policy change at the federal level which restructured the EUC program, increasing the number of weeks available through the EUC's second tier to 14 (from 13), and creating third (13 weeks), and fourth (6 weeks) tiers. The TUR in MD exceeded the threshold value for the third tier but not the fourth (Isaacs and Whittaker, 2014).

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[2]See the Office of Unemployment Insurance website, Online, *accessed 14 Sep. 2018.*

7. Virginia, 11/8/2009, EUC: Number of weeks available through the EUC program increases from 33 to 47. This change resulted from a policy change at the federal level which restructured the EUC program, increasing the number of weeks available through the EUC's second tier to 14 (from 13), and creating third (13 weeks), and fourth (6 weeks) tiers. The TUR in VA exceeded the threshold value for the third tier but not the fourth (Isaacs and Whittaker, 2014).

**Changes to State Regular PBD During ATUS Sample**

Between 4/2011 and 8/2014 the states of Arkansas, Florida, Georgia, Illinois, Michigan, Missouri, North Carolina, and South Carolina each passed legislation reducing their regular PBDs below 26 weeks (Isaacs, 2019). This variation is not relevant for our scanner data sample but is utilized in our ATUS analyses. Here we provide additional detail on each of these policy changes, listed in order of the month that the relevant PBD change is first recorded in our data. Unless otherwise noted sources are the Department of Labor's Reports on State UI Legislation.[3].

1. Arkansas, 4/2011: Arkansas Senate Bill 593 reduced AR's PBD to 25 weeks. (See 2011 report #5.)

2. Missouri, 5/2011: Missouri House Bill 163 reduced MO's PBD to 20 weeks (Johnston and Mas, 2018).

3. South Carolina, 7/2011: South Carolina House Bill 3672 reduced SC's PBD to 20 weeks. (See 2011 report #6.)

4. Florida, 1/2012: Florida House Bill 7005 reduced FL's PBD to between 12 and 23 weeks depending on the state's unemployment rate. Specifically, the PBD of UI in FL is updated up to once annually on January 1st based on the unemployment rate in the state during the third quarter of the previous year. During our ATUS sample, FL's PBD decreased from 26 to 23 weeks in 1/2012, to 19 weeks in 1/2013, and to 16 weeks in 1/2014. (See 2011 report #5.)

5. Illinois, 1/2012: Illinois House Bill 1030 reduced IL's PBD to 25 weeks. (See 2011 report #7.)

6. Michigan, 2/2012: Michigan House Bill 4408 reduced MI's PBD to 20 weeks. (See 2011 report #2.)

7. Georgia, 7/2012: Georgia House Bill 347 reduced GA's PBD to between 14 and 20 weeks depending on the state's unemployment rate. Specifically, the PBD of UI in GA is updated up to twice annually on January 1st and July 1st based on the unemployment rate in the state during the previous October

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[3]See the Office of Unemployment Insurance website, Online, *accessed 12 Mar. 2020*

and April, respectively. During our ATUS sample, GA's PBD decreased from 26 weeks to 19 weeks in 7/2012, to 18 weeks in 7/2013, and to 15 weeks in 7/2014. (See 2012 report #1.)

8. <u>North Carolina, 7/2013</u>: North Carolina House Bill 3672 reduced NC's PBD to between 12 and 20 weeks depending on the state's unemployment rate. Specifically, the PBD of UI in NC is updated up to twice annualy on January 1st and July 1st based on the unemployment rate in the state during the previous October and April, respectively. During our ATUS sample, NC's PBD decreased from 26 to 19 weeks in 7/2013, and to 14 weeks in 7/2014. (See 2013 report #10.)

# Appendix 3: Additional Evidence of Awareness of UI Benefit Extensions

This appendix uses Google Trends and national polls to provide additional evidence of general awareness about UI benefit extensions during the Great Recession. Though Google Trends does not report raw search numbers, they do allow comparison of popularities across five search items per query.[4] By scaling across all five search items and 104 weeks, one can compare search indices within weeks to get a better sense of the absolute popularity of a particular search item. In Online Appendix Figure A2, we conduct three separate five-item searches, juxtaposing "Unemployment benefits" against four other popular searches. In the first panel, we compare searches for "Unemployment benefits" against "Disability insurance," "Food stamps," "Pell," and "Recession." Across our time frame, "Unemployment benefits" was a more popular search term than each of these four items. People searched for "Unemployment benefits" roughly twice as often as "Food stamps." The term with the largest search volume was "Recession" in January 2008 (at the onset of the Great Recession), and yet the popularity of this search was only slightly greater than the popularity for searches for "Unemployment benefits" during the ARRA implementation. In latter 2009, people searched "Unemployment benefits" at nearly three times the rate of the term "Recession." In the second panel of Online Appendix Figure A2, we compare "Unemployment benefits" to "Earned Income Tax Credit," "Social security," "Welfare," and "TANF." Again, "Unemployment benefits" was one of the more popular search items, with "Social security" being only slightly more popular on average.

Finally, in order to compare the absolute popularity of "Unemployment benefits" to non-economics terms, in the third panel, we include the search terms "Disneyland," "Eiffel Tower," "Wall-E," and "Summer camp." Once again, "Unemployment benefits" was one of the more popular search items during this time period. Wall-E was one of the most popular movies in 2008; during the week of Wall-E's peak search-popularity in June of 2008, people still searched for "Unemployment benefits" at roughly 20% the frequency of "Wall-E" (i.e. for every five searches for "Wall-E," there was one search for "Unemployment benefits"). Searches for "Summer camp" are unsurprisingly cyclical, yet during the summer of 2009, these searches seldom exceeded searches for "Unemployment benefits." During the first EUC change and the ARRA period, search volume for "Unemployment benefits" is comparable to "Disneyland." Searches for "Unemployment benefits" roughly double the amount of searches for "Eiffel Tower," despite the Eiffel Tower being the fifth most searched item on Google Maps.

To further understand workers' awareness of UI benefits during the Great Recession, we also examine

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[4]Though the Google Trend's scale cannot be mapped into total search volume on Google Search, estimates do exist on the popularity of Google Search overall. For instance, roughly 3.5 billion searches are made per day. From 2008 to 2009, there were nearly 1.4 trillion total searches made on Google Search. Source: WordStream, Online, *access 31 Jul. 2019.*

polls that were conducted during these years. Since 2001, Gallup has surveyed Americans about their top concerns (e.g., crime and violence, drug use, hunger and homelessness, the economy, unemployment).[5] In March 2008 (six months before Lehman Brothers went bankrupt), 36% of respondents answered that they worry a great deal about unemployment. By March 2010, this had increased to 59%. Those worrying a great deal remained above 50% for the next three years and then steadily declined to 23% in 2018. Thus, UI benefit extensions came during a time when Americans were highly concerned about unemployment. In a poll more closely related to UI extensions, YouGov/Huffington Post surveyed 1000 U.S. adults in April 2014 about unemployment benefits extensions.[6] When asked—"How much have you heard about Congress letting unemployment benefits expire for people who have been unemployed more than six months at the end of last year?"—23% responded that they had heard a lot, 45% had heard a little, and 32% had heard nothing at all. This poll provides suggestive evidence that a majority of Americans had some level of awareness about extended UI benefits.

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[5]Source: Gallup, Online, *accessed 3 May 2018.*
[6]Source: *YouGov.com*, Poll Results: Unemployment, April 18–21, 2014, Online, *accessed 3 May 2018.*

# Appendix 4: Length of unemployment spells

The PBD extensions that we exploit in our analysis will only directly affect unemployed workers who remain unemployed for longer than 46 weeks. Thus, we should only expect a shirking response to these extensions if workers believed that there was a meaningful chance of suffering an unemployment spell longer than 46 weeks.

From the basic CPS monthly files for the months in our scanner data sample (December 2008 to February 2011), we extract a sample of 4,031 unemployed adult workers who resided in the Washington D.C. metropolitan area (Flood et al., 2017). The average duration of unemployment at the time of the survey was 29 weeks with a median of 18 weeks, while the 75th percentile of the distribution of unemployment duration was 43 weeks.[7] The lengths of unemployment spells are increasing drastically during this time (e.g., the overall mean increases from 24 weeks in the first half of our sample to 34 weeks in the second half) and this is consistent with what is seen nationally.[8] These estimates of unemployment durations are based on unadjusted samples of the stock of unemployed workers, and may be underestimating the true length of the unemployment spell due to right censoring (Kiefer, Lundberg and Neumann, 1985). Thus, it is reasonable to conclude that a low-skilled worker in the Washington D.C. metro area during the time period of our sample would have been concerned with the possibility of long term unemployment.

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[7]Relevant statistics split by various subsamples are also plotted in Online Appendix Figure A4.

[8]According to the Federal Reserve Economic Data (FRED), national mean unemployment durations nationally increased from 20 weeks to 37 weeks during our sample. (US Bureau of Labor Statistics, Average Weeks Unemployed [UEMPMEAN], retrieved from FRED, Federal Reserve Bank of St. Louis; Online, *accessed 15 Mar. 2020*.)

# Appendix 5: Additional Tables and Figures

Table A1: Summary statistics from ATUS sample (N=30,094)

| Worker-level variable | Mean | Std. Dev. |
|---|---|---|
| Age (in years) | 40.352 | 12.395 |
| Female | 0.462 | 0.499 |
| Race: | | |
|  - White | 0.834 | 0.372 |
|  - Asian | 0.029 | 0.169 |
|  - Black | 0.115 | 0.319 |
| Born in the US | 0.918 | 0.275 |
| Works in private sector | 0.831 | 0.375 |
| Occupation sector: | | |
|  - Management occupations | 0.111 | 0.314 |
|  - Sales and related occupations | 0.101 | 0.301 |
|  - Office and administrative support | 0.151 | 0.358 |
| Works part time | 0.121 | 0.326 |
| Usual number of weekly hours | 41.732 | 9.173 |
| Weekly earnings (in $) | 900.487 | 1694.676 |
| Paid hourly (not salary) | 0.454 | 1.635 |
| Number of minutes at the workplace: | | |
|  - Not working (shirking) | 31.833 | 37.550 |
|  - Working | 478.613 | 139.776 |

Notes: American Time Use Survey (ATUS) data initially collected at the respondent-activity level from the years 2003 to 2014, then collapsed to the respondent level. Observation weights provided by ATUS.

Table A2: Estimated UI eligibility in Mas and Moretti (2009) sample

|                       | mean    | sd     | min    | max     |
|-----------------------|---------|--------|--------|---------|
| Total hours to date   | 1347.01 | 903.61 | 0.0028 | 4414.14 |
| Shift length (hours)  | 6.18    | 2.99   | 0.0008 | 16.08   |
| Tenure to date (days) | 384.43  | 189.91 | 0.0000 | 748.00  |
|                       |         |        |        |         |
| UI Eligibility Rate:  |         |        |        |         |
| - DC 2008             | 0.83    | 0.37   | 0.0000 | 1.00    |
| - DC 2009             | 0.84    | 0.37   | 0.0000 | 1.00    |
| - DC 2010             | 0.84    | 0.37   | 0.0000 | 1.00    |
| - DC 2011             | 0.84    | 0.37   | 0.0000 | 1.00    |
| - MD 2008             | 0.80    | 0.40   | 0.0000 | 1.00    |
| - MD 2009             | 0.81    | 0.39   | 0.0000 | 1.00    |
| - MD 2010             | 0.81    | 0.39   | 0.0000 | 1.00    |
| - MD 2011             | 0.81    | 0.39   | 0.0000 | 1.00    |
| - VA 2008             | 0.74    | 0.44   | 0.0000 | 1.00    |
| - VA 2009             | 0.77    | 0.42   | 0.0000 | 1.00    |
| - VA 2010             | 0.79    | 0.41   | 0.0000 | 1.00    |
| - VA 2011             | 0.79    | 0.41   | 0.0000 | 1.00    |
|                       |         |        |        |         |
| N cashiers            | 412     |        |        |         |
| N cashier-shifts      | 55,205  |        |        |         |

Notes: This information is based on a subset of the data used in Mas and Moretti (2009) which includes every transaction for 6 stores in the same metropolitan area of the Western Census region between (roughly) 2004 and 2006. After estimating cumulative hours worked at the cashier-shift level, we drop managers from the sample and estimate UI eligibility in our state-years for all cashier-shifts worked in a store that had been in the sample for 3 or more calendar quarters.

UI eligibility rules vary by state and are based on earnings histories in the location of employment, not residence. The UI eligibility rules in our sample are as follows (Source: Department of Labor, Online, *accessed 14 Sep. 2018*): In Maryland, $900 in wages in the first four of the last five completed calendar quarters, with ≥$576 in the highest earning of those quarters, and >$0 in wages in two of those quarters; In Virginia, $2,700 in wages in either the first four or the last four of the last five completed calendar quarters, with ≥$2,700 in wages during the highest two earning of those quarters; In Washington D.C., $1,950 in wages in either the first four or the last four of the last five completed calendar quarters, and either ≥$1,300 in the highest earning of those quarters or ≥$1,950 in the two highest earning of those quarters.

These estimates are likely to be conservative since a cashier's first day in the Mas and Moretti (2009) sample is likely not their first day at the retailer, a cashier may have relevant earnings from other employers, and a cashier may earn more than the minimum wage.

Table A3: Results with data collapsed to cashier-register-day level

| | Avg.(Transaction Length) | | ln(Avg.(Transaction Length)) | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Potential benefit duration | 0.187 | 0.184 | | |
| | (0.064) | (0.078) | | |
| 18-week PBD increase | | | 0.019 | 0.017 |
| | | | (0.009) | (0.011) |
| Total expenditures | 0.082 | 0.060 | 0.000 | -0.000 |
| | (0.073) | (0.073) | (0.000) | (0.000) |
| Total items scanned | 2.875 | 2.710 | 0.011 | 0.010 |
| | (0.296) | (0.318) | (0.002) | (0.002) |
| Price discounts/coupons | 0.559 | 0.679 | 0.005 | 0.005 |
| | (0.135) | (0.146) | (0.001) | (0.001) |
| Local UE rate (prior month) | -0.699 | -0.814 | -0.010 | -0.010 |
| | (0.721) | (0.743) | (0.004) | (0.004) |
| State UE rate (prior month) | -1.403 | -0.583 | -0.002 | 0.002 |
| | (2.081) | (2.236) | (0.013) | (0.013) |
| | | | | |
| Observations | 30,179 | 27,279 | 30,121 | 27,218 |
| Controls | X | X | X | X |
| Date FE | X | X | X | X |
| Register X Store FE | X | | X | |
| Cashier X Store FE | X | | X | |
| Cashier X Register X Store FE | | X | | X |

Notes: Potential benefit duration is measured in weeks. Transaction expenditure is measured in dollars. Controls for each regression include indicators for whether the transaction included items from particular departments (e.g., alcohol), an indicator for whether a plastic bag tax was in place at the store, the total number of registers open during the transaction, the cashier's experience as measured by total number of career transactions completed, the cashier's "fatigue" as measured by the number of transactions the cashier had previously completed on that shift, and the cashier's length of shift measured in both number of transactions and in minutes. "Date" refers to exact date (e.g., August 3, 2017). Standard errors, shown in parentheses, are clustered at state by date level.

Table A4: Main results – Sensitivity to cashier controls and ignoring/dropping EUC=0 weeks

| | Without Cashier Controls | | Ignore EUC = 0 | | Drop EUC = 0 | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Potential benefit duration | 0.174 | 0.175 | 0.133 | 0.130 | 0.133 | 0.146 |
| | (0.058) | (0.068) | (0.047) | (0.056) | (0.048) | (0.058) |
| Total expenditures | 0.133 | 0.134 | 0.134 | 0.134 | 0.135 | 0.134 |
| | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) |
| Total items scanned | 2.854 | 2.852 | 2.821 | 2.825 | 2.848 | 2.852 |
| | (0.053) | (0.052) | (0.052) | (0.052) | (0.054) | (0.054) |
| Price discounts/coupons | 0.730 | 0.735 | 0.720 | 0.726 | 0.717 | 0.723 |
| | (0.024) | (0.024) | (0.024) | (0.024) | (0.025) | (0.025) |
| Local UE rate (prior month) | -0.687 | -0.596 | -0.678 | -0.661 | -0.516 | -0.567 |
| | (0.493) | (0.535) | (0.429) | (0.463) | (0.442) | (0.485) |
| State UE rate (prior month) | -2.542 | -2.845 | -1.537 | -1.354 | -1.568 | -1.217 |
| | (1.389) | (1.503) | (1.196) | (1.268) | (1.225) | (1.293) |
| | | | | | | |
| Observations | 515,618 | 515,433 | 515,618 | 515,433 | 471,826 | 471,647 |
| Controls | X | X | X | X | X | X |
| Date FE | X | X | X | X | X | X |
| Register X Store FE | X | | X | | X | |
| Cashier X Store FE | X | | X | | X | |
| Cashier X Register X Store FE | | X | | X | | X |

Notes: Potential benefit duration is measured in weeks. Transaction expenditure is measured in dollars. Controls for each regression include indicators for whether the transaction included items from particular departments (e.g., alcohol), an indicator for whether a plastic bag tax was in place at the store, number of households participating in SNAP per state-month, the total number of registers open during the transaction, the cashier's experience as measured by total number of career transactions completed, the cashier's "fatigue" as measured by the number of transactions the cashier had previously completed on that shift, and the cashier's length of shift measured in both number of transactions and in minutes. "Date" refers to exact date (e.g., August 3, 2017). Standard errors, shown in parentheses, are clustered at state by date level.

Table A5: Main results by various standard error clusters

| | State-Date | | State-Month | | Cashier | | Cashier-Register | | Store | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Potential benefit duration | 0.133 | 0.130 | 0.133 | 0.130 | 0.133 | 0.130 | 0.133 | 0.130 | 0.133 | 0.130 |
| | (0.047) | (0.056) | (0.043) | (0.046) | (0.055) | (0.059) | (0.048) | (0.053) | (0.071) | (0.076) |
| Total expenditures | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 | 0.134 |
| | (0.013) | (0.013) | (0.012) | (0.012) | (0.013) | (0.013) | (0.012) | (0.012) | (0.021) | (0.020) |
| Total items scanned | 2.821 | 2.825 | 2.821 | 2.825 | 2.821 | 2.825 | 2.821 | 2.825 | 2.821 | 2.825 |
| | (0.052) | (0.052) | (0.073) | (0.072) | (0.050) | (0.050) | (0.047) | (0.047) | (0.072) | (0.072) |
| Price discounts/coupons | 0.720 | 0.726 | 0.720 | 0.726 | 0.720 | 0.726 | 0.720 | 0.726 | 0.720 | 0.726 |
| | (0.024) | (0.024) | (0.035) | (0.034) | (0.021) | (0.021) | (0.020) | (0.020) | (0.033) | (0.034) |
| Local UE rate (prior month) | -0.678 | -0.661 | -0.678 | -0.661 | -0.678 | -0.661 | -0.678 | -0.661 | -0.678 | -0.661 |
| | (0.429) | (0.463) | (0.579) | (0.633) | (0.378) | (0.422) | (0.347) | (0.400) | (0.418) | (0.531) |
| State UE rate (prior month) | -1.537 | -1.354 | -1.537 | -1.354 | -1.537 | -1.354 | -1.537 | -1.354 | -1.537 | -1.354 |
| | (1.196) | (1.268) | (1.175) | (1.102) | (1.355) | (1.453) | (1.187) | (1.342) | (2.201) | (2.634) |
| Observations | 515,618 | 515,433 | 515,618 | 515,433 | 515,618 | 515,433 | 515,618 | 515,433 | 515,618 | 515,433 |
| Clusters | 339 | 339 | 36 | 36 | 1,966 | 1,963 | 8,370 | 8,185 | 39 | 39 |
| Controls | X | X | X | X | X | X | X | X | X | X |
| Date FE | X | X | X | X | X | X | X | X | X | X |
| Register X Store FE | X | | X | | X | | X | | X | |
| Cashier X Store FE | X | | X | | X | | X | | X | |
| Cashier X Register X Store FE | | X | | X | | X | | X | | X |

Notes: Potential benefit duration is measured in weeks. Transaction expenditure is measured in dollars. Controls for each regression include indicators for whether the transaction included items from particular departments (e.g., alcohol), an indicator for whether a plastic bag tax was in place at the store, number of households participating in SNAP per state-month, the total number of registers open during the transaction, the cashier's experience as measured by total number of career transactions completed, the cashier's "fatigue" as measured by the number of transactions the cashier had previously completed on that shift, and the cashier's length of shift measured in both number of transactions and in minutes. "Date" refers to exact date (e.g., August 3, 2017). Standard errors are shown in parentheses.

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Table A6: Results from American Time Use Survey (ATUS) - Minutes spent at workplace

| | Minutes spent at workplace | | | |
| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| 18-week PBD increase | 0.2209 | 1.0525 | 0.9007 | 1.1862 |
| | (1.3582) | (2.9187) | (1.4834) | (2.5087) |
| State UE rate (prior month) | | | -0.6143 | -0.6460 |
| | | | (0.9657) | (0.9530) |
| Maximum WBA (100s) | | | -3.7401 | -3.8411 |
| | | | (2.9008) | (3.0414) |
| | | | | |
| Observations | 30,094 | 30,094 | 30,094 | 30,094 |
| Mean of Y | 510.4462 | 510.4462 | 510.4462 | 510.4462 |
| State FE | X | X | X | X |
| Month FE | X | | X | |
| Year FE | X | | X | |
| Month-Year FE | | X | | X |
| Controls | | | X | X |

Notes: Controls include state unemployment rate and maximum UI benefits (in dollars), the individual's age, "usual" amount of hours worked per week, weekly earnings, hourly wage, and dummies for family income, gender, race, US citizenship, whether the individual had multiple jobs, class of worker (e.g., federal government vs. state government vs. private for profit), and general occupational category (e.g., "sales and related occupations" vs. "healthcare support occupations"). Observations weighted according to ATUS probability weights. Standard errors, shown in parentheses, are clustered at state level.

Figure A1: Map of the Washington DC Metropolitan Area
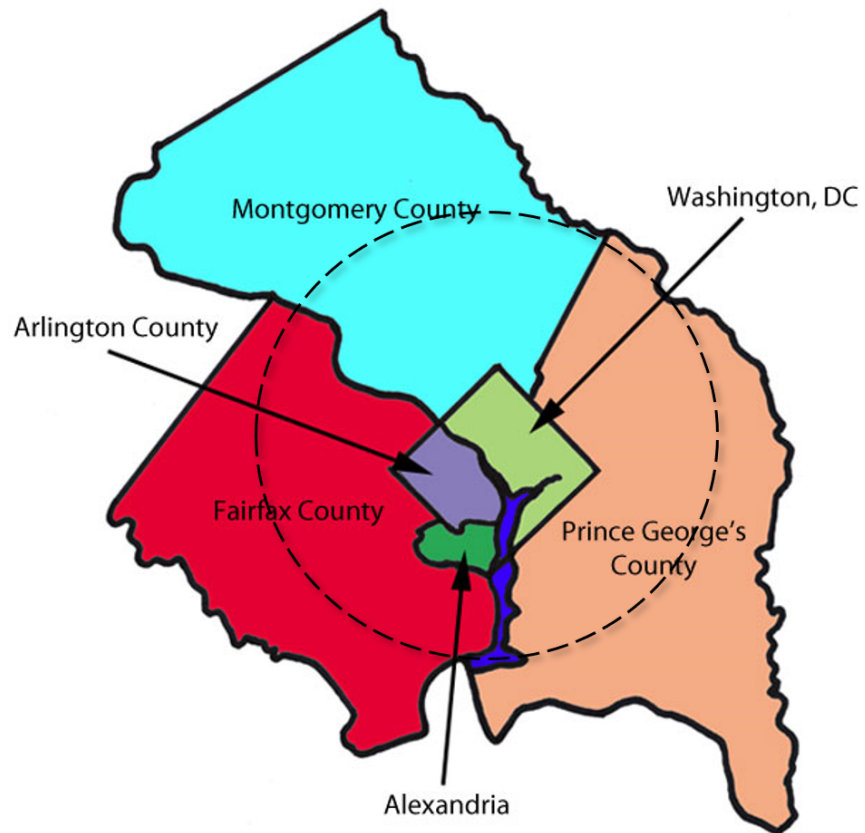


Notes: This figure provides a stylized map of the Washington DC Metropolitan area. The circle represents the area in which the 39 stores in the scanner data sample are located. Montgomery & Prince George's Counties are in Maryland. Arlington County, Fairfax County, and the City of Alexandria are in Virginia.

## Figure A2: Searches on Google via Google Trends - "Unemployment benefits" vs. other searches
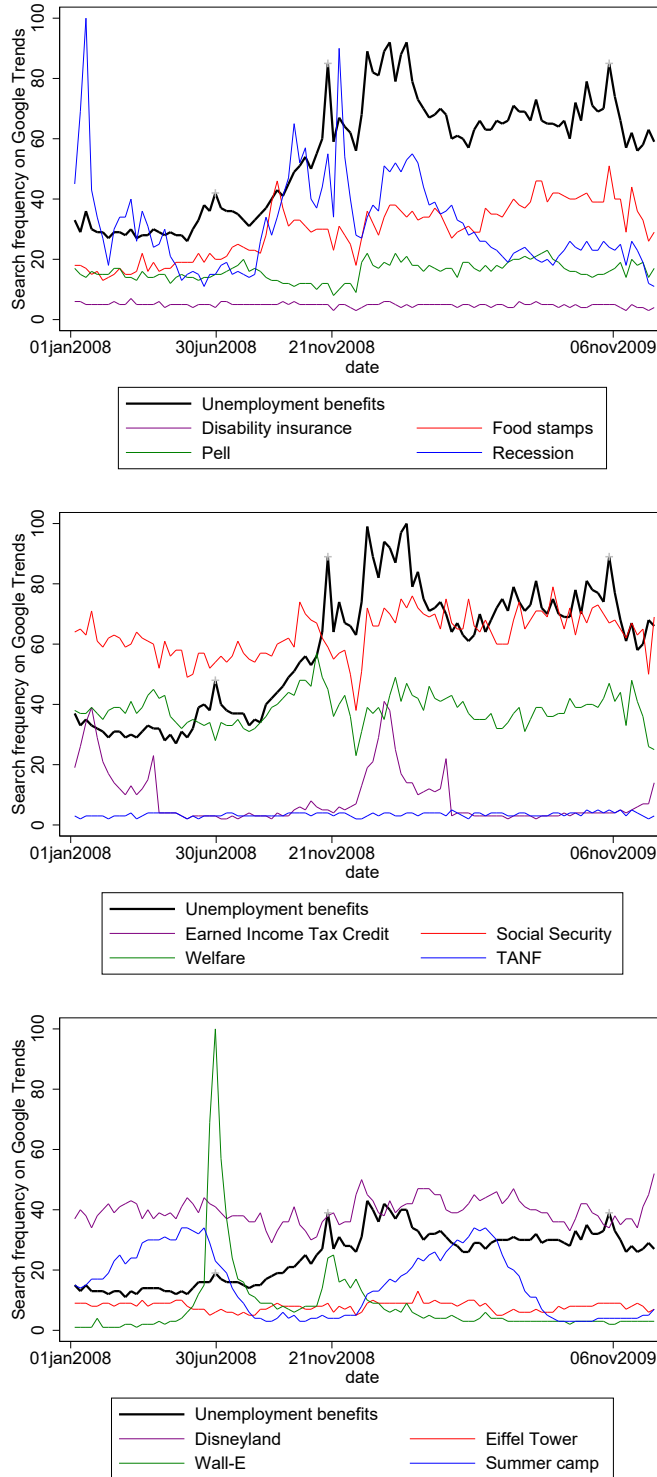


Notes: Google Trends data retrieved from Google Inc. Each panel reports a five-item query for "Unemployment benefits" (in black) vs. four other items for our time period (January 2008 - December 2009). For each term-week, Google Trends first calculates the ratio of the term's search volume to the total number of searches (i.e. an absolute search measure for that term-week). Then, Google Trends proportionally scales all ratios across weeks and the five queried search terms to a [0,100] scale. So, within a given week, the ratio of two indices reveals the ratio of search frequency between two terms. For example, during the week of "Wall-E"'s peak search popularity, there were roughly five times the amount of searches for "Wall-E" than there were "Unemployment benefits."

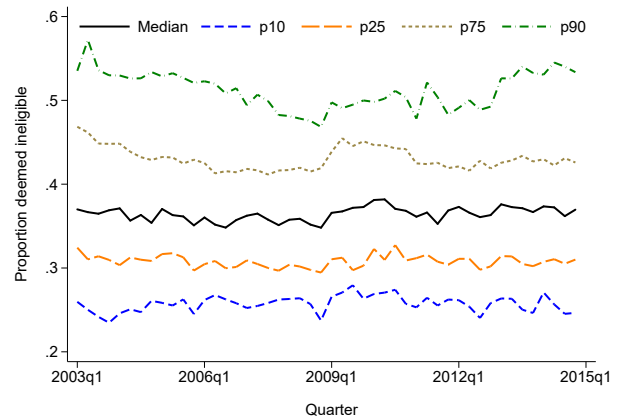Figure A3: Time series of UI claimants

(a) Fired workers regularly file for UI (*Administrative UI claims data from California*)
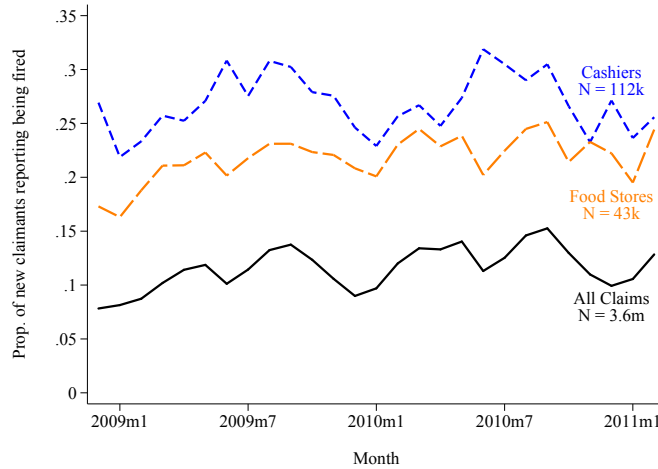


(b) Over 20% of accepted UI claimants were fired
(*Benefit Accuracy Measurement data*)
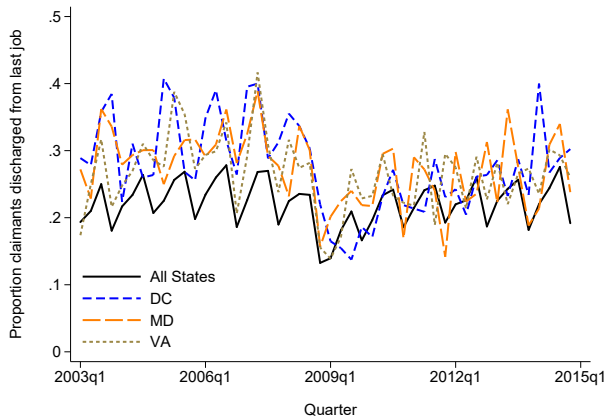


(c) Most claimants with misconduct determinations
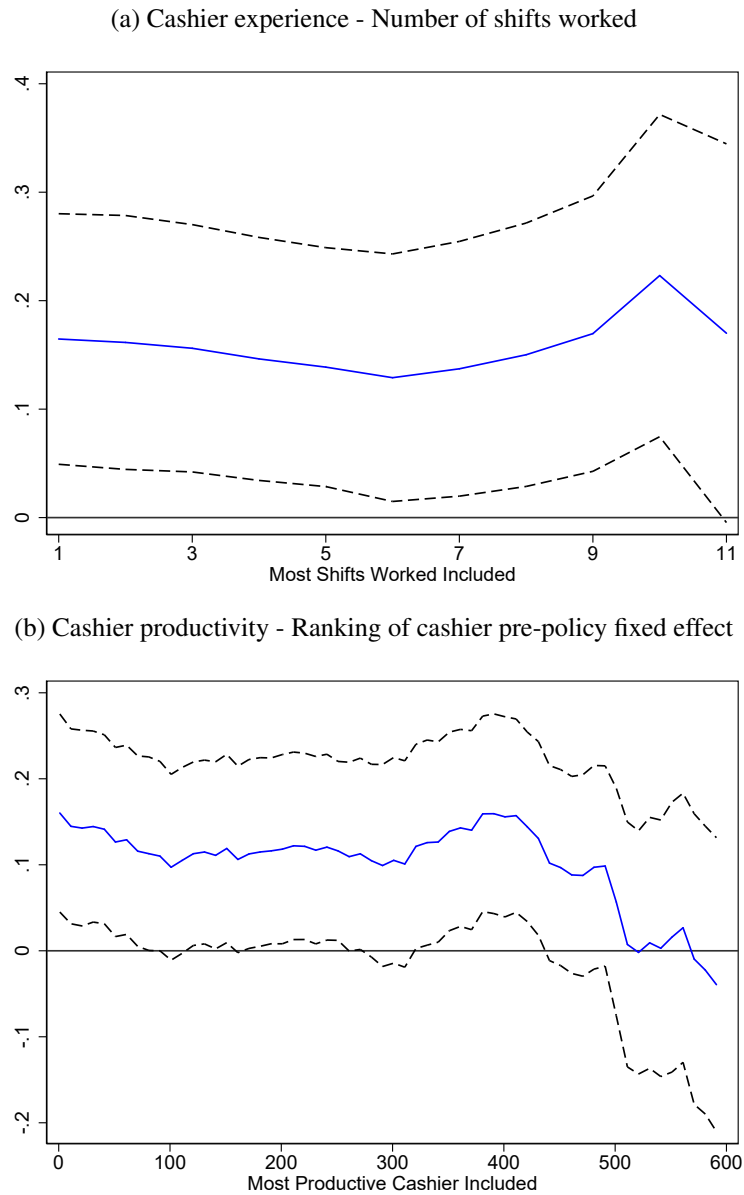still receive UI (*US Department of Labor*)



Notes: Panel (a) utilizes administrative UI claims microdata acquired from the California Employment Development Department. The graph depicts the proportion of claims filed in CA during the time period of our scanner data sample, in which the claimant was fired from their last job. Panel (b) graphs the proportion of claimants who were fired from their last job in the Department of Labor's (DOL) Benefit Accuracy Measurement (BAM) data. The BAM program audits a randomly selected subsample of claimants receiving UI benefits in every state-week. Claims with missing separation reasons are excluded from panels (a) (39%) and (b) (0.4%). Panel (c) graphs variation across state-quarters in the proportion of misconduct determinations resulting in a denial of benefits from the DOL Employment and Training Adminstration's report 207. As described in section 3.3, all claims by discharged workers result in such a determination.

Figure A4: Distribution of unemployment durations in CPS sample

Continuous Weeks Unemployed
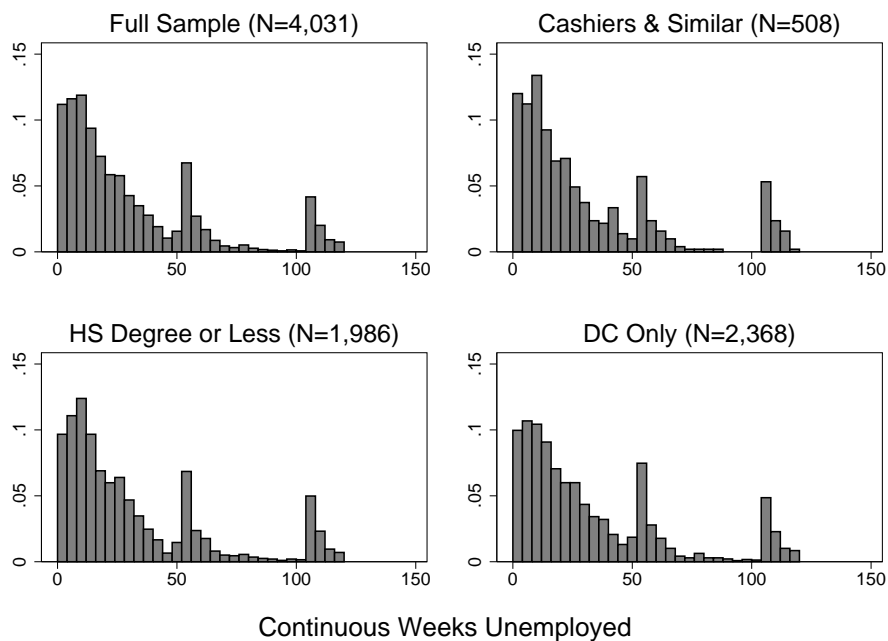
Notes: Each panel plots the distribution of unemployment spells for a cross-section of workers from the CPS monthly files for the months in our cashier sample (December 2008 to February 2011) who resided in the Washington D.C. metropolitan area. Jumps in distribution roughly correspond to (self-reported) unemployment spells of one year and two years.

Figure A5: The effect of PBD on transaction duration by cashier subsamples

(a) Cashier experience - Number of shifts worked



(b) Cashier productivity - Ranking of cashier pre-policy fixed effect



Notes: Point estimates (solid line) and 95% confidence intervals (dashed) for estimates of the effect of PBD on transaction duration from our fully specified model (cashier-register and day fixed effects, and controls) across numerous specifications. Each model is estimated in a different subgroup restricted to transactions completed by particular cashiers. In panel (a), starting with the full sample on the left (cashiers who worked at least 1 shift before the first policy change), estimates increase slightly as we focus on cashiers who worked, at a minimum, a higher number of shifts. In panel (b), starting with the full sample of cashiers on the left (where higher rankings correspond to higher productivity), estimates decrease as we focus on cashiers with higher rankings of pre-policy productivity.

Figure A6: Does the effect of PBD on transaction duration vary with transaction size?
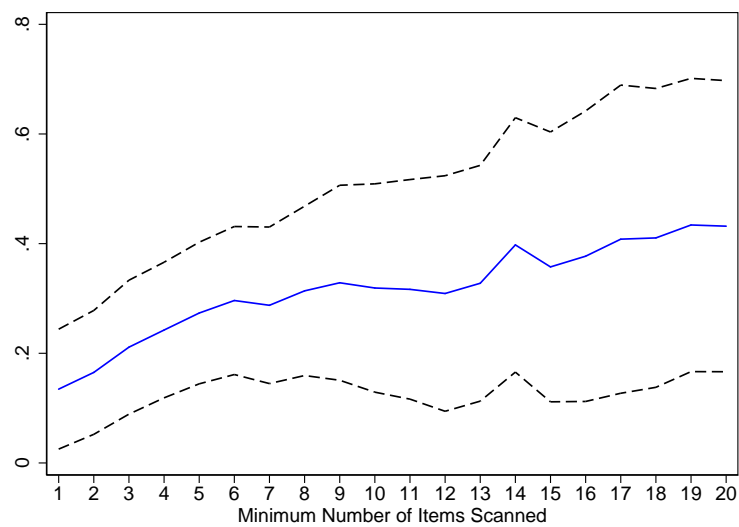


Notes: Point estimates (solid line) and 95% confidence intervals (dashed) for roughly 20 estimates of the effect of PBD on transaction duration from models with cashier-register fixed effects and controls. Each model is estimated in a different subgroup restricted to transactions that included more than a certain number of items.

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