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Abstract

The goal of this research is to explore whether actual lottery revenues are sensitive to scarcity, as measured by intra-monthly variation in financial resources. Exogenous paydays of social security benefits are employed to generate the intra-monthly variation in financial resources. Using two million observations on daily lottery revenues that cover more than 2,500 lottery outlets in Israel for two years (2015-2016), I find that gambling revenue spikes at social security paydays. The estimation results imply that on Income Support payday aggregate lottery revenues are higher by 5 percent after controlling for outlet, weekday, holidays, month and year fixed effects. However, the calculated aggregate response of lottery revenues on Income Support payday is quite small and equal 0.5 percent of the total monthly payments deposited to the bank account of Income Support recipients. In addition, the other social security and salary paydays induce a trivial impact relative to total monthly payments deposited to the bank account of the respective recipients. These results survive a list of sensitivity analyses and pass a placebo test.

JEL-Codes: I300.

Keywords: scarcity, poverty, social security payday, gambling.

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Introduction

In the past few years, a novel and intriguing literature has emerged that suggests that poverty itself affects economic behavior of poor individuals, in addition to the two opposing camps that emphasizes either internal (personal) characteristics or external conditions.[2] The goal of this research is to explore the gambling behavior of social security recipients on social security paydays in order to learn the effect of scarcity on economic decision-making. Mullainathan and Shafir (2013) and others (see below) show that scarcity drives down the available cognitive ability, will-power stock and attention resources. Consequently, poor individuals are more likely to make bad economic decisions that may exacerbate the conditions of poverty. However, the negative effects of scarcity are the result of an effort of poor individuals to do a positive thing: to focus on the mission at hand. Thus, scarcity has both positive and negative consequences on economic decision making.

Following this line of reasoning, one may suggest that bad judgement as a result of scarcity is expected when economic choices involve costs and benefits in different periods. People in poverty are more likely to suffer from over-borrowing (benefits today and costs tomorrow) and under-insurance and sub-investment (costs today and benefits tomorrow). In contrast, poor individuals are expected to show good performance when costs and benefits occur at the same time (today) as in the case of allocating a limited budget between different spending items. Due to scarcity, making ends meet is at the center of their focus.

Based on that theoretical argument, the performance of managing family budget along the month should be related to the degree of scarcity. Poor households are expected to allocate more of their budget to more essential goods (such as basic food) relative to less essential goods (such as lottery) as scarcity reaches its peak toward the end of the month, right before the next social security payday. To test this hypothesis, I examine whether intra-monthly variation in gambling spending is linked to intra-monthly variation scarcity. In particular, on social security paydays, due to the easing of scarcity, gambling expenditures should peak relative to the rest of the month (*scarcity*

[2] There is also a series of studies that shows that poverty itself may play a role in perpetuating poverty over time due to capital market imperfections (e.g., Loury 1981, Banerjee and Newman 1991, Galor and Zeira 1993, Piketty 1997, Dahan and Tsiddon 1998).

effect).[3] That prediction is based on the assumption that consumption of gambling is less needed to physical survival is adopted here, which is a plausible one.[4]

At a first glance, a spike in gambling spending on payday may seem to contradict the idea that after "harvest" (the arrival of social security benefits), poor individuals perform better and are less expected to engage in excessive gambling. However, in examining that decision, one has to consider that the decision to spend on gambling today competes directly and currently with other expenditures such as basic food, and therefore is distinctively different from other financial decisions that expand available resources at the expense of future consumption, such as taking out loans which might be prone to limited attention, lower self-control and restricted cognitive regulation.

A spike in gambling expenditures on a social security payday may also result from the easing of a liquidity constraint. Under the permanent income hypothesis, a deposit of social benefits that its amount and arrival date are known in advance should not change overall consumption, including lottery spending. While individuals are predicted to smooth their consumption over the month due to decreasing marginal utility, low-income households may still deviate from intra-monthly smoothing policy because of liquidity constraints. Such behavior would drive up expenditures on gambling as well as other types of spending at payday (*liquidity effect*) in line with several studies which have shown that expenditures and the caloric intake of liquidity-constrained households spike at a payday (Stephens 2003, 2006; Shapiro 2005; Mastrobuoni and Weinberg 2009; Gelman et al. 2014 and Carvalho et al. 2016). Thus, low-income households are more likely to deviate both from smoothing their level of consumption due to *liquidity effect* and from smoothing their consumption composition because of *scarcity effect*.

To examine the aggregate gambling reaction of households to the arrival of social security benefits, I employ a dataset of actual lottery daily revenues at the outlet level for the years 2015-2016 (which amount to almost two million observations) to estimate the response in lottery revenues around

[3] In light of Spears (2011)' findings, one may speculate that unproductive economic decisions may reach their peak right before payday because this is also the time of the month that the stock of self-control and cognitive control reach the lowest level after a full month of financial juggling.

[4] The expected behavior is similar also if gambling is considered as a form of investment rather than consumption: Investing a small amount of money in exchange for a slim possibility to become rich. Scarcity should drive down such activity as it is associated with costs today (lower consumption today) and potential benefits tomorrow (high future consumption).

social security paydays. To polish the empirical identification, I focus on *Income Support* payday and neighborhoods where the recipients of *Income Support* are more likely to live. This group is also more likely to suffer from liquidity constraints. The intra-monthly variation in financial resources is exploited to identify the causal effect of scarcity and liquidity on gambling behavior that is represented by the actual extent of lottery expenditures. Exogenous paydays of social security benefits are exploited to generate the intra-monthly variation in the degree of scarcity and liquidity constraints.

The empirical analysis shows that gambling revenue in state-lottery outlets spikes at social security paydays and in particular on *Long Term* allowances and *Income Support* paydays. The estimation results imply that on *Income Support* payday aggregate lottery revenues are higher by 5 percent after controlling for outlet, weekday, holidays, month and year fixed effects. The estimated aggregate effects of social security paydays on gambling revenues allow us to compute the size effect relative to total social security monthly payments. The calculated aggregate response of lottery revenues on *Income Support* payday is rather small and equals approximate 0.5 percent of the total monthly payments deposited to the bank account of *Income Support* recipients. In fact, the net effect is even smaller given that the expected gain from gambling, which equals approximately sixty percent of the cost of purchasing a lottery ticket. In addition, this study found that the other social security and salary paydays induce a trivial impact relative to total monthly payments deposited to the bank account of the respective recipients.

The methodology employed here, by construction, controls for (the distribution of) individual characteristics and external circumstances that may impact gambling behavior. Our exogenous intra-monthly variation in financial resources implies that individual characteristics are the same in the start and in the end of the month in this empirical setting. Additionally, the timing of social security paydays should not be correlated with lottery spending other than the effect of economic scarcity. Therefore, such an empirical strategy mutes the two main sources of poverty which may plague the old research on why poor individuals are more likely to play lottery: (1) people with certain unobserved internal (personal) characteristics are both more likely to gamble and earn low

income (2) people are poor due to external circumstances, which also may affect the tendency to spend more on lottery.[5]

The research contributes to the literature on the sources of poverty and its consequences by exploring a new hypothesis according to which, scarcity may induce households to violate a smoothing pattern of the composition of consumption (essential relative to less essential goods) along the month. Unlike most previous studies, this paper investigates the relationships between *actual* decisions and *actual* scarcity, which is not experimentally manufactured but occurs naturally as a result of exogenous social security paydays. Examining the relationship between social security paydays and gambling behavior may also inform policy debate surrounding the choice between cash and in-kind transfers.[6] This is particularly important in a country that occupies the top league in terms of income inequality (Dahan 2017b).

The paper is structured as follows. In the next section, the related literature is reviewed. Sections 3, 4 and 5 present the empirical investigation and the last section concludes.

2. Related literature

In a series of papers, Mullainathan, Shafir and others uncover the potential negative impact of living in poverty on economic decision-making.[7] According to the new paradigm, poor individuals face constant financial juggling, which may potentially result in low quality of decision-making (in areas that are outside the limits of managing the family budget) due to limited attention, limited self-control and limited cognitive regulation. The most important implication of this new literature is that scarcity leads to bad economic decisions, which might reinforce the conditions of poverty.

[5] Extensive literature shows that poor individuals spend a larger share of their income on gambling, and some studies even find that they spend more in absolute terms. Moreover, *problem gambling* is more common among poor individuals (Welte et al. 2001, St. Pierre et al. 2014). Four surveys, which summarizes dozens of studies conducted in economics and other fields, showed that low-earning populations spend a larger share of their income on legal gambling (Clotfelter and Cook 1991; Miyazaki et al. 1998; Beckcert and Lutter 2009; Perez and Humphreys 2013), and in some studies, even a larger amount of money (Rintoul et al. 2014). Dahan (2017a) revealed similar findings for Israel: state lottery and Toto tend to set up significantly more sales points in disadvantaged neighborhoods.

[6] A recent review of 42 studies concludes that the estimates of cash transfer on temptation goods suggest that the concerns of abuse of cash transfers for cigarettes and alcohol are unfounded (Evan and Popova 2017).

[7] See Bertrand, Mullainathan and Shafir (2004), Duflo (2006), Shah et al. (2012), Mani et al. (2013), Mullainathan and Shafir (2013) and Bernheim et al. (2016). See also a review article by Haushofer and Fehr (2014) on the relationships between poverty, stress and economic behavior.

Focusing on a limited stock of attention mechanism, Shah et al. (2012) demonstrate that scarcity drives individuals to over-borrowing. Their findings, which are based on lab experiments, support the notion that scarcity leads people to devote more attention to pressing problems while neglecting others. As a result of their reduced financial resources, poor individuals face difficult trade-offs that elicit greater attention. Given a limited attention capacity, attentional neglect is expected in both non-financial and financial decisions.

Using laboratory studies and field experiments, Mani et al. (2013) show that scarcity also impedes cognitive function. In their first field experiment, New Jersey mall shoppers were presented with manufactured scenarios intended to invoke financial concerns among some of them. Mani et al. (2013) found that poor participants performed worse than the rich in two standard cognitive performance measures. They have demonstrated similar findings in a second field experiment in India. In that experiment, scarcity was instrumented by pre-harvest period among sugarcane farmers in India. The same sugarcane farmers show much better cognitive performance after-harvest than they did during the pre-harvest period. The decline in performance before the harvest is substantial, and it is equivalent to a fall of around 13 IQ points. Note that the implicit assumption is that poverty has a contemporaneous effect on economic behavior. Employing labs and partially randomized field experiments, Spears (2011) also shows that poverty is associated with diminished behavioral control.

However, recently, Carvalho et al. (2016) have questioned the negative effect of poverty on cognitive function and economic decisions by showing that poor and non-poor participants made similar risk choices and economic decisions, which is not in line with the mentioned studies. Scarcity in this study was represented by the period before payday. Yet, the authors found that the before-payday group behaved as if they were more present-biased than did the after-payday group, which is consistent with previous findings. Carvalho et al. (2016) suggest that liquidity constraints may explain the different behavior.

While the previous literature has made an important contribution to the knowledge of the impact of scarcity on economic behavior, our understanding of the consequences of poverty in the real world is still in its infant stage. Thus far, the positive effect of scarcity (packing more efficiently a smaller suitcase) on *actual* economic decisions has attracted less research attention. This paper

focuses on the positive effect of scarcity, unlike most of the recent literature that emphasis the negative consequences of scarcity. In particular, the impact of scarcity on managing the family budget priorities has been overlooked. The current research would fill partially that gap by examining the relationships between *actual* scarcity and an *actual* budget decision.

3. Data

Daily revenue data from during two years 2015-2016 for each and every lottery outlet in Israel is provided by the Pais. The legal gambling market in Israel is composed of two vendors: the Pais Institute and the Council for Regulation of Sports Gambling (Toto). In 2015, legal gambling revenue in Israel amounted to about 10 billion Israeli Shekels (2.5 billion U.S. dollars), divided between Pais (70%) and Toto (30%). The Pais, which is at the center of the current research, was established in 1951 as an additional source of fiscal funding for local authorities. Regulation neither limits the number of outlets nor their location, and the Pais operates approximately 2,500 outlets across Israel. Some outlets sell Pais products only, while others offer gambling products alongside other goods, such as cigarettes and snacks.[8]

Table 1 presents daily gambling revenues by social security paydays as well as other important potential determinants of gambling. As can be seen, lottery revenues are 8% higher on *Income Support* actual payday as compared to an average day, which is in line with our theoretical prediction. In fact, gambling revenues are higher on all three other social security paydays. The higher lottery revenues on social security paydays emerge even looking at table 2 that depict daily revenue by the calendar day of the month rather than the actual social security paydays. For example, we can see a spike in aggregate lottery revenues on 14th, which is the official *Income Support* payday (see below).

However, social security paydays by definition do not occur on a weekend or holiday and therefore the observed impact on lottery revenues must take such variables into account. This is particularly important given the difference in gambling revenues between weekdays, weekend and holidays.

[8] Pais is supervised by the Ministry of Finance (MOF), which also approves its annual budget and profit distribution. The state benefits from profits (and from income taxes paid by winners) that are used to fund public projects. Pais's net profit is distributed, according to the MOF guidelines, such that 46.25% is spent on building classes and kindergartens, another 46.25% is distributed to local municipalities, and the remaining 7.5% is provided to cultural and educational projects.

For example, table 1 shows that Thursday is 68 percentage points higher than Saturday in terms of gambling revenues. The empirical analysis takes into account weekday and as well as other factors (such as holidays) to get unbiased estimates of the aggregate impact of social security paydays on lottery revenues.

The data on the daily revenues on each of the 2,500 Pais outlets for two years, amounts to almost two million in observations, and is mapped into statistical areas with well-defined demographic and socio-economic characteristics. A statistical area is a geographic unit (approximately one square mile), defined by the Israel Central Bureau of Statistics' (ICBS) with around 3,000 -- 4,000 inhabitants. The ICBS dataset at the statistical area level is rather rich and includes variables, such as average income per capita, the fraction of the statistical areas' households that receives *Income Support* from social security, the share of people at the age of 65 and older and the fraction of children (younger than age 19).

The data on social security paydays for the years 2015-2016 is taken from the Israeli National Insurance Institute (Social Security). The Israeli Social Security pays monthly benefits to about 3 million recipients, which include, among others, pension and survivors (933,000 households), disability (234,000), *Child allowances* (1,148,000), *Unemployment Benefits* (66,000) and *Income Support* (90,000).[9] *Long Term* social security benefits, such as pension and disability, are paid and transferred directly to the beneficiary's bank account on the 28th of each month (the monthly average spending is 4.3 billions Shekels). Note that almost every household in Israel has a bank account. In addition, *Income Support*, *Unemployment Benefits* and *Child allowances* are delivered on the 14th (12th since October 2016), 17th and 20th, respectively. Social security spends on *Income Support*, *Unemployment Benefits* and *Child allowances* 190, 260 and 500 million Shekels, respectively.[10] Regularly, if the 28th is a Saturday or a holiday, the payment is made on the next day, and the same rule applies to paydays of other social security benefits. However, social benefits might be paid a few days earlier than scheduled to all recipients on two Jewish holidays (Passover and the Jewish New Year), two Muslim holidays (Eid al-Edha and Eid al-Fitr), one or two Druze holidays (Nabi Suieb) and one Christian holiday (Christmas) based upon the discretion of the

[9] Israel Social security annual report, 2016 (table 9).
[10] Bank of Israel annual report for the year 2016 (table F.14).

Ministry of Finance. Table 3 presents the actual dates of the social security paydays for the years 2015-2016.

Salary paydays are potential factors in determining daily aggregate gambling in addition to social security paydays. According to the Israeli law, a salary must be paid no later than 10 days after the end of the previous working month. Most public employees receive once a month their paycheck at the first day of the month while employers in the business sector are more diverse in their salary paydays. Large business organizations like Banks pay their employees on the beginning of the month while other (usually less organized workers) get their paychecks on the 10th. Table 1 shows that daily lottery revenues is substantially higher on the 1st and 10th, which are the two most common paydays of salaried workers and to lesser extent on the end of the month when a smaller fraction receives their paycheck.[11]

4. Empirical framework

A panel dataset on daily revenue for all lottery outlets in Israel and social security paydays is exploited to test the effects of scarcity and liquidity on economic behavior. The following statistical model is employed to estimate the effect of social security paydays on daily lottery revenue:

$$(1)\quad R_{i,t,m,y} = \mathbf{SSP_{m,y}\alpha_1} + \mathbf{SP_{m,y}\alpha_2} + \mathbf{c_{t,w,m,y}\alpha_3} + \mathbf{c_{t,h,m,y}\alpha_4} + \mathbf{m\alpha_5} + \mathbf{y\alpha_6} + \mathbf{D_i\alpha_7} + u_{i,t}$$

where $R_{i,t,m,y}$ is the natural logarithm of daily revenues in lottery outlet *i* at day *t* in month *m* in year *y*. SSP stands for a list of 4 actual social security paydays and SP represents two dummy variable for the two most frequent (actual) salary paydays. Note that actual salary payday is often postponed by one day if 1st is on Saturday while salary is paid one day earlier if 10th is Saturday. $c_{t,w,m,y}$ is a vector of 7 dummy variables for each weekday to capture the potential difference between weekday and weekend as well as lottery weekday specifics. For example, every Tuesday evening, the state lottery announces the winning numbers which may attract more demand for

[11] According to data obtained confidentially from one of the biggest banks in Israel, 30% of all workers receive their paycheck on the 1st of the month, 25% between 2nd to 9th, 25% on the 10th and approximately 12% at the end of the month (the rest gets their salary between the 11th and the end of the month). Note that the total of net wages was around 260 billion shekels in 2016. The estimated net wage is calculated using the number of jobs times the average gross wage, excluding the average income tax rate (25%) and other deductions (13%).

gambling on that day. Additionally, $c_{t,h,m,y}$ is a vector of dummy variables for Jewish and non-Jewish religious holidays (and civil holidays such as independence day). This list of dummy variables reflects the likely difference in gambling revenues between holidays and weekdays as lottery outlets are fully or partially closed on holidays (especially on Jewish holidays). D_i is a lottery outlet fixed effect, and *m* and *y* are dummy variables for the month and year fixed effects. Note that the estimated model does not include an area's socio-economic characteristics due to the presence of an outlet fixed effect. Unobserved determinants of daily revenues at the outlet level are represented by the error term, $u_{i,t,m,y}$.

In the sensitivity analysis, the list of control variables also includes a dummy variable for the length of the month, which equals 1 if the length of the month is 31 days and 0 otherwise. Alternatively, the full variation in the length of the month may be exploited by dropping the month fixed effect and replacing it by a vector of four dummy variables for the length of the month (28, 29, 30 and 31). For example, in the year 2015 receiving *Income Support* payment on January 14, a social security recipient has to finance 31 days up until the next payday while in February, it goes down to 28 days (around a 10% difference).

The vectors $\boldsymbol{\alpha}$ are unknown parameters that would be estimated. The daily revenues' responses to the social security *payday* are revealed by the coefficients on SSP but the most relevant coefficient is *Income Support* (a means-tested program) payday when the most disadvantaged households receive their social benefits. This coefficient will be contrasted with coefficients on the other three social security paydays when a more diverse group (households with both low and high income) gets their social benefits. This estimation would also reveal the coefficients on the 1st and 10th, which are the common paydays of salaried workers in both public sector and the private sector.

To focus even more on the aggregate effect of scarcity and liquidity on gambling among low-income households, the coefficients of social security paydays and salaried workers paydays would be also estimated separately for various sub-groups of statistical areas by their socio-economic status (of the households which surround each lottery outlet). It is expected that the coefficient on *Income Support* payday would be higher in areas that belongs to the lowest socio-economic status as compared to areas with a higher status, assuming that *Income Support* recipients are more likely to be concentrated in low socio-economic status neighborhoods.

What about prize size? It's included, and you do present the variable month length. So why not the prize?

5. Results

The main findings of this paper are presented in table 4. The aggregate gambling revenues are significantly higher on *Income Support* payday, when the poorest of all social security recipients get a paycheck. The estimated coefficient implies that on *Income Support* payday aggregate lottery revenues are higher by 5 percent after controlling for salary paydays, outlet, weekday, holidays, month and year fixed effects (table 4: column 1).[12]

Based on the estimated coefficient, the response of aggregate lottery revenues to *Long Term* allowance payday is even higher than *Income Support*, more than 8 percent, (table 4). Unlike *Income Support* beneficiaries, *Long Term* allowances recipients which include old age pension, survivors and disability recipients are a more diverse group of households. Old age pension is mostly universal program as both low and high households are entitled to that allowance.[13] Thus, the rise in aggregate lottery revenues on *Long Term* allowance payday could not be attributed necessarily to low-income households, which are more likely to be liquidity constrained. Theoretically, it might be the result of higher gambling by high-income households on *Long Term* allowance payday. However, estimating the effect of *Long Term* allowance payday on lottery revenues for various clusters of socio-economic status separately might provide an improved answer (see below).

A rise of approximately 2 percent in aggregate lottery revenues is detected on *Unemployment Benefits* payday (table 4). The uncertainty regarding the specific group that is responsible for the increase in aggregate lottery revenues is relevant also for *Unemployment Benefits*. Again, to circumvent the heterogeneous group of households that receive unemployment benefits, the impact

[12] Note that the estimated effect is sensitive to weekday and holiday fixed effects. For example, the coefficient of *Income Support* payday goes up when weekday and holiday fixed effects are excluded since that payday is by construction a weekday with higher lottery revenues relative to weekend and holiday.

[13] Pensioners with zero or low income/wealth are entitled to a higher allowance. The share of means-tested old age pension is 9 percent out of the total spending on old age and survivors allowances in 2016 (Israeli Social Security monthly publication)

of *Unemployment Benefits* payday on lottery revenues is estimated below separately for different clusters of socio-economic status.

Surprisingly, aggregate lottery revenues are almost insensitive to *Child allowances* payday (table 4). The average *Child allowances* monthly paycheck is relatively small (436 Israeli Shekels on average) unlike *Income Support*, *Unemployment Benefits* and *Long Term* allowances with average monthly paycheck of 2,133, 3,909 and 3,142, respectively.[14] The unresponsiveness of *Child allowances* might be the result of lack of saliency that is associated with a transfer of a small amount of money to most households. One additional speculation is that parents may be reluctant to spend money on gambling that its source is labeled "a child benefit" (Kooreman, 2000). This suggestion is even more plausible given that in Israel *Child allowances* are transferred to their mother's bank account.

Salary paydays are also important dates in the calendar that may affect gabling behavior. Table 4 shows a spike in gambling revenues on the 10th and to lesser extent on the start and end of the month paydays, which are the three most common salary paydays. The higher response on the 10th is in line with the fact that less protected and organized workers are more likely to receive their paycheck on the 10th and they are also more likely to experience liquidity constraints. In contrast, based on the estimated effect only a minor reaction of lottery revenues is detected on the 1st, when unionized workers and high-paid employees are more likely to be paid (the balance of power prevents their employers from postponing their paycheck to last day possible, the 10th).[15]

The estimated coefficient of *Income Support* payday is even higher (6%) when the prize size is included in the list of control variables. As expected, the prize size which is measured in Millions of Israeli Shekels, has a positive and significant effect on gambling revenues.[16] The estimated coefficient implies that one additional million to the prize size is associated with approximately 1.3% extra revenue for state lottery. Note that the coefficients of both child allowance and

[14] For comparison, the minimum wage was 4,650 Israeli Shekels in 2016.
[15] The salary of workers who receive their paycheck at the beginning of the month is significantly higher than workers who get their salary at the 10th of month (based on one of the biggest banks in Israel.
[16] The winning lottery numbers of the Israeli state lottery are released twice a week (Tuesday and Saturday evening) and the daily prize size is constructed by assigning each day the stated highest prize size of the upcoming drawing day (including that day itself).

beginning of the month payday are sensitive to the inclusion of the prize size. The sign of these two coefficients is reversed which call for extra care in interpreting them.

The main results are quite the same when socio-economic cluster (of the households that live around the lottery outlet) is used instead of outlet fixed effects (table 4: columns 3-4). As can be seen, the socio-economic cluster has a negative and significant coefficient which implies that lottery expenditures have a regressive incidence. In fact, households in lower socio-economic neighborhoods spend a higher amount of money in a*bsolute* terms as compared to the more affluent neighborhoods which means highly regressive spending. This conclusion implicitly assumes that individuals tend to buy gambling products near their place of residence which is supported by several empirical studies (e.g., St-Pierre et al 2014).

The estimated aggregate effects of social security paydays on gambling revenues allows to compute how large are those effects relative to total social security monthly payments for each and every social assistance program. The aggregate response of lottery revenues on *Income Support* payday is around 1.6 million Israeli Shekels (5% time the aggregate daily lottery revenues) which is approximate 0.5 percent of the total monthly payments deposited to the bank account of *Income Support* recipients, which is 192 million Israeli Shekels (table 5). In fact, the net effect is even smaller given that the expected gain from gambling which equals approximately sixty percent of the cost of purchasing a lottery ticket. Similarly, employing the estimation results, the extra aggregate lottery revenues on *Unemployment Benefits* payday is less than 0.2 percent relative to the total monthly *Unemployment Benefits* payments transferred to the bank account of their beneficiaries. In contrast, *Long Term* and *Child allowances* paydays and salary paydays induce trivial impact relative to total monthly payments deposited to the bank account of respective recipients (table 5).

The small portion of *Income Support* aggregate benefits that is spent on gambling might nevertheless result in painful consequences if it is generated by a small group of problem gamblers. To assess that possibility, I run the baseline regression for each and every lottery outlet separately. Figure 2 presents the distribution of the estimated coefficients of *Income Support* payday in 2,490 lottery outlets. As can be seen, most of the estimated coefficients are between 0 and 10% which implies that the estimated aggregate spike of around 5% in gambling expenditures on *Income*

Support payday does not reflect an extreme jump in a few lottery outlets but rather a widespread and relatively similar behavior in many different locations. This exercise reduces the risk that a few income support recipients who spend a large fraction of their benefits on gambling are responsible for the spike in lottery expenditures. Furthermore, based on a representative sample of Israeli adults, 75% of the participants reported having engage in gambling in the past year (Gavriel-Fried 2015).

Table 6 presents an alternative specification that employs the calendar day of the month instead of actual social security and salary paydays. This estimation provides us with evidence on gambling revenues dynamic along the month which serves to detect fluctuation around original *Income Support* payday and other social security and salary paydays. The estimated coefficients which are depicted in figure 1 represent the impact of each calendar day of the month compared to the 14th day of the month (the omitted variable), which is at the center of this research. As can be seen in figure 1b, all coefficients but one are negative implying a higher level of lottery revenues on official *Income Support* payday in comparison to any other day except the 10th salary payday. The coefficient of 10th is the only day with a positive sign, in line with the previous findings. The interpretation of the revenues dynamic is more complicated given the additional "clocks" of income cycles (due to several paydays) which operate at the same time. The fluctuations of lottery revenues around *Income Support* payday may be influenced by the 10th salary payday, which occurs four days earlier. Nevertheless, it seems that the rise in lottery revenues at paydays is short lived and limited mainly to payday only. The coefficients of a day or two days after *Income Support* payday are negative but small relative to other days of the month. In general, the coefficients tend to be more negative toward the end of the month except the *Long term* payday. This observed dynamic is consistent with the hypothesis raised above that households allocate less of their family budget to gambling toward the last days of the month. Thus, the dynamic analysis seems to lend extra support to the main findings despite the noise which is associated with using the original rather than the actual social security paydays.

One may speculate that the spike in aggregate lottery revenues on social security paydays reflect certain behavior that is specific to particular days on monthly calendar rather than paydays. To address this potential concern, we use a placebo test according to which certain original social security paydays were used instead of the actual paydays that were different because of non-Jewish

religion holidays such as Christmas. For example, the original *Long Term* paydays was scheduled to 28th of December 2016 but the actual deposit of *Long Term* allowance to bank accounts to all social security recipients regardless of their religion took place on the 22nd. The coefficient of the original social security paydays should pick that effect in case lottery revenues are related to particular days on a monthly calendar. Table 7 shows that using the original social security paydays has no significant effect when using the baseline regression. The size of the effect is quite trivial but turns negative once the prize size is included. This result suggests that social security paydays are the driving force behind the rise in lottery revenues rather than the calendar day itself.

To get more confidence in the main result of this research, the effect of social security paydays on lottery revenues is estimated separately for various clusters of socio-economic status of the households that surround a lottery outlet. The estimated impact of *Income Support* payday should be bigger in lottery outlets that are located in lower socio-economic neighborhoods where *Income Support* recipients are more likely to live. Table 8 demonstrates that indeed the estimated coefficient of *Income Support* payday is around half when the estimation is limited to the three most affluent neighborhoods relative to the bottom three most disadvantageous neighborhoods. A similar pattern emerges of decreasing in payday coefficient size as we move up the socio-economic cluster for *Unemployment Benefits* and *Long Term* allowances paydays.

The main results remain the same also when the length of the month is included in the list of control variable and robust when excluding lottery outlets that are not sufficiently active, (outlets that are have positive daily revenues for less than fifty days in each of the two years 2015-2016). These results are not reported here for space reasons.

6. Conclusion

In a press conference following the publication of the recommendations of a government committee on the regulation of the gambling market, the Israeli Finance Minister said that "electronic gambling machines are the most greased machines to take money from disadvantages groups. This is dirty money that we do not want. It is not a coincidence that on the 28th of every month, the payday of social security benefits, state-lottery revenues *increase* dramatically."[17] The

[17] *TheMarker* newspaper, August 3, 2016.

empirical analysis presented in this paper confirms partially this observation.[18] Gambling revenue spikes at social security paydays, and especially on *Long Term* and *Income Support* paydays. The estimation results imply that on *Income Support* payday aggregate lottery revenues are higher by 5 percent after controlling for outlet, weekday, holidays, month and year fixed effects. However, the calculated aggregate rise of lottery revenues on *Income Support* payday is quite small (equals approximate 0.5 percent) relative the total monthly payments deposited to the bank account of *Income Support* recipients. While the spike in lottery revenues on *Long Term* allowances payday is 8 percent, it implies a trivial impact relative to total monthly payments deposited to the bank account of the *Long Term* recipients. This conclusion applies also for other social security and salary paydays.

The findings of the current empirical exploration do not lend strong support to the new view that poverty itself may affect economic behavior such as gambling spending. While scarcity may induce bad decisions due to limited attention, reduced willpower and lower stock of available cognitive ability, it does not seem to have a sizeable effect on the decision to play lottery even if we attribute all the estimated aggregate response in lottery revenue to the scarcity effect (i.e., zero liquidity effect). Thus, this study suggests that the main reasons for the differences in economic behavior between poor and non-poor are still associated with either internal characteristics or external economic environment.

While there is a rise in lottery expenditures on social security payday, these findings also suggest that the general belief, as reflected by statement of the Israeli finance minister, that social security recipients rush to lottery outlets on social security payday is not an accurate description of realty. Social security recipients spend just a trivial fraction of their social security benefits on lottery on social security payday. The data shows that a similar spike occurred in many lottery outlets on *Income Support* payday which lowers the concern that the observed rise in lottery expenditures is driven by a few problem gamblers among recipients of *Income Support* benefits.

The results of this paper might serve as an input to public discourse regarding the cash versus in-kind transfer debate. Providing social assistance in the form of cash is not necessarily associated with high risks of excessive gambling on social security paydays. These risks could even be more

[18] While this strong suggestion by the Finance Minister reflects a common belief, no evidence was provided to support it.

limited by supplementary policy tools. Policy makers may consider, subject to rigorous cost-benefit analysis, restricting opening hours of lottery outlets on social security paydays. Note that this paper shows that the rise in lottery expenditures is limited to social security payday. In addition, social security may contemplate depositing social security benefits twice (or more) a month rather than once a month. Increasing the number of payments for a given social benefits may reduce the saliency of social security benefits and might attenuate the spike in lottery spending on social security payday. This assertion is based on the result of insensitivity of aggregate revenues on *Child allowances* payday, which can be explained by small and seemingly unnoticeable change in family income on that day.

This paper does not provide the separate effect of scarcity and liquidity on gambling expenditures. A natural next stage of this line of research would be to isolate the effect of scarcity. In particular, to disentangle the impact of scarcity from liquidity, the joint evolution of food consumption relative to sin or temptation goods (such as gambling, cigarettes and alcohol) should be explored.[19] Does gambling expenditure on payday increase more or less on payday as compared to food consumption? The empirical answer to this question is part of my future research agenda.

[19] The definition of Banerjee and Mullainathan (2010) for temptation goods is: "goods that generate positive utility for the self that consumes them, but not for any previous self that anticipates that they will be consume in the future." Braido et al. (2012) use spending on cigarettes, gambling and alcohol as temptation goods to examine the effect of cash transfer on intra-household allocation.

Table 1: Descriptive statistics - lottery revenues in the years 2015-2016[a]

	All lottery outlets[b]		Active lottery outlets[c]	
	Average	Standard deviation	Average	Standard deviation
Daily revenue: all (Israeli Shekel)	8,276	9,611	8,511	9,688
Social security paydays				
Social security payday: Long term	9,314	10,637	9,577	10,700
Social security payday: Income support	9,066	10,386	9,329	10,474
Social security payday: Un. benefits	8,639	9,849	8,891	9,933
Social security payday: Child allowances	9,544	10,790	9,827	10,881
Paycheck days				
1st of the month	8,557	9,817	8,807	9,885
10th of the month	9,024	10,493	9,274	10,574
Last day of the month	8,401	9,641	8,643	9,713
Weekday				
Daily revenue: Sunday	8,497	10,282	8,738	10,369
Daily revenue: Monday	8,695	9,975	8,940	10,046
Daily revenue: Tuesday	11,245	11,061	11,572	11,126
Daily revenue: Wednesday	8,259	9,810	8,490	9,881
Daily revenue: Thursday	8,722	10,040	8,973	10,120
Daily revenue: Friday	6,110	6,666	6,291	6,726
Daily revenue: Saturday	5,656	6,716	5,806	6,764
Month				
Daily revenue: January	8,053	9,272	8,260	9,316
Daily revenue: February	8,592	9,738	8,808	9,786
Daily revenue: March	8,636	10,112	8,853	10,151
Daily revenue: April	7,976	9,500	8,200	9,579
Daily revenue: May	7,729	9,222	7,960	9,314
Daily revenue: June	8,392	9,647	8,648	9,739
Daily revenue: July	8,473	9,885	8,732	9,961
Daily revenue: August	8,208	9,593	8,447	9,690
Daily revenue: September	8,465	9,669	8,704	9,768
Daily revenue: October	7,940	9,317	8,160	9,393
Daily revenue: November	8,283	9,564	8,514	9,642
Daily revenue: December	8,535	9,702	8,820	9,806
Year				
2015	8,191	9,512	8,386	9,551
2016	8,358	9,705	8,634	9,820
Number of lottery outlets	**2,504**		**2,149**	
Number of active days	**592**		**659**	
Number of observations	**1,482,887**		**1,417,147**	

Source: Pais (Israeli state lottery).

a. The average daily revenue was calculated only using days with positive revenue.

b. 1,150 observations with negative revenues were omitted from the investigated population.

c. An outlet was defined as active if it had a positive revenue for 50 days at least in both years.

Table 2: Daily revenues in 2015-2016, by the calendar day of the month and socio-economic cluster (active lottery outlets)

Calendar day of the month	Daily lottery revenues in Israeli Shekel	Daily revenue, by socio-economic cluster 2015[a]			
		1-3 (lowest)	4-5	6-7	8-10 (highest)
1	8,841	9,288	8,502	8,669	8,619
2	8,344	8,793	7,908	8,080	8,257
3	8,739	9,016	8,282	8,543	8,688
4	7,912	8,300	7,532	7,689	7,827
5	8,654	8,958	8,204	8,394	8,656
6	8,769	9,087	8,394	8,588	8,692
7	8,647	9,006	8,208	8,470	8,553
8	8,776	9,149	8,445	8,602	8,659
9	8,484	8,886	8,176	8,109	8,351
10	9,519	10,063	9,223	9,168	9,073
11	8,221	8,852	7,969	7,829	7,719
12	8,562	9,157	8,218	8,170	8,097
13	8,925	9,415	8,687	8,646	8,638
14	**8,913**	**9,509**	**8,584**	**8,620**	**8,483**
15	8,742	9,275	8,406	8,450	8,359
16	8,437	8,916	8,051	8,109	8,305
17	8,708	9,271	8,322	8,415	8,537
18	8,245	8,763	7,886	7,994	7,956
19	8,483	8,972	8,115	8,230	8,231
20	8,549	8,961	8,190	8,279	8,385
21	8,501	8,971	8,128	8,183	8,293
22	8,105	8,556	7,801	7,853	7,848
23	7,861	8,391	7,450	7,550	7,723
24	8,283	8,619	7,927	8,043	8,278
25	7,900	8,427	7,566	7,645	7,634
26	8,269	8,669	7,981	7,999	8,146
27	8,251	8,572	7,871	8,073	8,247
28	8,796	9,395	8,469	8,440	8,567
29	8,729	9,259	8,494	8,437	8,417
30	8,090	8,532	7,721	7,803	7,965
31	8,581	9,102	8,212	8,259	8,331
Average	**8,511**	**8,971**	**8,159**	**8,238**	**8,309**
Outlets[b]	**2,149**	**363**	**419**	**475**	**300**

Source: Pais (Israeli state lottery).

a. A statistical area in Israel is graded according to socio-economic cluster between 1 (the lowest status) to 10 (the highest status), which is based on residents' characteristics such as income per capita and education level.

b. The social economic cluster is not available for 592 active lottery outlets due to a lack of socio-economic cluster grade for the statistical area of the lottery outlet. Thus, the sum of the number of outlets in the four right columns aren't equal to the number of outlets in the second column on the left. The classification of lottery outlets into socio-economic clusters is based on well-known ICBS Socio-Economic Index.

Table 3: Actual Social Security Paydays, 2015-2016

	14th Income Support		17th Unemployment Benefits		20th Children Allowance		28th Long Term Allowances	
	2015	2016	2015	2016	2015	2016	2015	2016
January	14	14	**18**[a]	17	20	20	28	28
February	**15**[a]	14	17	17	20	**21**[a]	**27**[d]	28
March	**15**[a]	14	17	17	20	20	**29**[a]	28
April	14	14	17	17	20	20	**21**[b]	**20**[b]
May	14	**15**[a]	17	17	20	20	28	**29**[a]
June	14	14	17	17	**21**[a]	20	28	28
July	14	14	**14**[b]	17	**14**[b]	20	28	28
August	14	14	17	17	20	**21**[a]	28	28
September	**10**[b]	**8**[b]	**11**[b]	**18**[a]	20	20	**21**[b]	28
October	14	**13**[b]	**18**[b]	**13**[b]	20	**14**[b]	28	28
November	**15**[a]	14	17	17	20	20	**29**[a]	28
December	14	**12**[c]	17	**18**[a]	20	20	**22**[b]	**22**[b]

a. Postponed to Sunday since the original payday fell on a Saturday.
b. Brought forward because original payday fell on a Holiday.
c. Social security has change permanently income support payday from 14th to 12th.
d. The original payday fell on a Saturday, but the next Sunday was in the next month, so the payday was brought forward.
e. Social security paydays earlier than original dates due to Muslim, Christian or Druze holidays are mark in red color.

Table 4: The effect of actual social security paydays on gambling revenues
(The dependent variable: log daily gambling revenues)[a]

	(1)	(2)	(3)	(4)
Long Term Allowances	**0.084*** (0.002)**	**0.078*** (0.002)**	**0.079*** (0.003)**	**0.079*** (0.003)**
Income Support	**0.050*** (0.002)**	**0.061*** (0.002)**	**0.061*** (0.003)**	**0.060*** (0.003)**
Unemployment Benefits	**0.021*** (0.002)**	**0.026*** (0.002)**	**0.030*** (0.002)**	**0.030*** (0.002)**
Children Allowance	**-0.004** (0.002)**	**0.024*** (0.002)**	**0.022*** (0.002)**	**0.022*** (0.002)**
1st	**0.019*** (0.002)**	**-0.010*** (0.002)**	**-0.009*** (0.003)**	**-0.009*** (0.003)**
10th	**0.075*** (0.002)**	**0.073*** (0.002)**	**0.071*** (0.003)**	**0.071*** (0.003)**
End of the Month	**0.042*** (0.002)**	**0.018*** (0.002)**	**0.020*** (0.003)**	**0.020*** (0.003)**
Prize Size (NIS millions)		**0.013*** (0.000)**	**0.013*** (0.000)**	**0.013*** (0.000)**
Social Economic Cluster[b]			**-0.030*** (0.011)**	
Social Economic Cluster 4-5				**-0.191*** (0.061)**
Social Economic Cluster 6-7				**-0.159*** (0.059)**
Social Economic Cluster 8-10				**-0.202*** (0.068)**
Fixed Effects				
Outlet	Yes	Yes	No	No
Year	Yes	Yes	Yes	Yes
Weekday	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Holidays	Yes	Yes	Yes	Yes
Observations Lottery outlets	1,482,887 2,504	1,482,887 2,504	1,088,485 1,798	1,088,485 1,798

a. *, **, *** denote statistical level of 10%, 5% and 1% respectively. In parentheses appear robust standard errors.
b. The social economic cluster is not available for 706 lottery outlets (394,402 observations).

Table 5: The calculated aggregate effect relative to total monthly payments

	(1) Estimated aggregate impact on lottery revenues Israeli Shekel, Millions	(2) Total monthly payments (average) Israel Shekel, Millions	(1)/(2)
Long Term Allowances	1.6	4,300	0.00%
Income Support	1.0	192	0.52%
Unemployment Benefits	0.4	258	0.16%
Children Allowance	0.0	500	0.00%
1st	0.4	6,900	0.00%
10th	1.6	6,900	0.00%

Note: The calculated effect assumes that monthly share of net wage bill on 10th is around 32%. The results are insensitive to this assumption.

Table 6: The effect of calendar day on gambling revenues by social economic cluster
(The dependent variable: log daily gambling revenues)[a]

	Socio-economic cluster 2015[b]				
Month day	All	1-3	4-5	6-7	8-10
1	-0.033*** (0.003)	-0.042*** (0.008)	-0.037*** (0.007)	-0.028*** (0.007)	-0.011 (0.008)
2	-0.054*** (0.003)	-0.060*** (0.008)	-0.066*** (0.007)	-0.056*** (0.006)	-0.022*** (0.008)
3	-0.028*** (0.003)	-0.060*** (0.007)	-0.040*** (0.007)	-0.017*** (0.007)	0.007 (0.008)
4	-0.062*** (0.003)	-0.088*** (0.007)	-0.072*** (0.007)	-0.053*** (0.006)	-0.027*** (0.008)
5	-0.031*** (0.003)	-0.056*** (0.008)	-0.049*** (0.007)	-0.015** (0.007)	0.002 (0.008)
6	-0.050*** (0.003)	-0.076*** (0.008)	-0.064*** (0.007)	-0.038*** (0.007)	-0.019** (0.008)
7	-0.052*** (0.003)	-0.071*** (0.008)	-0.058*** (0.007)	-0.035*** (0.006)	-0.032*** (0.008)
8	-0.031*** (0.003)	-0.061*** (0.007)	-0.031*** (0.007)	-0.021*** (0.006)	0.005 (0.008)
9	-0.028*** (0.003)	-0.046*** (0.008)	-0.032*** (0.007)	-0.031*** (0.006)	-0.009 (0.008)
10	0.038*** (0.003)	0.025*** (0.007)	0.031*** (0.007)	0.036*** (0.006)	0.044*** (0.007)
11	0.001 (0.003)	-0.004 (0.007)	0.008 (0.006)	-0.008 (0.006)	-0.003 (0.008)
12	0.000 (0.003)	-0.008 (0.007)	0.002 (0.006)	-0.004 (0.006)	-0.004 (0.008)
13	0.005 (0.003)	-0.015** (0.007)	0.006 (0.006)	0.006 (0.006)	0.017** (0.008)
15	-0.029*** (0.003)	-0.031*** (0.006)	-0.033*** (0.006)	-0.031*** (0.006)	-0.025*** (0.008)
16	-0.035*** (0.003)	-0.044*** (0.007)	-0.041*** (0.006)	-0.040*** (0.006)	-0.006 (0.008)
17	-0.004 (0.003)	-0.014** (0.007)	-0.003 (0.007)	0.002 (0.006)	0.022*** (0.008)
18	-0.046*** (0.003)	-0.063*** (0.007)	-0.053*** (0.006)	-0.036*** (0.006)	-0.022*** (0.007)
19	-0.046*** (0.003)	-0.064*** (0.007)	-0.047*** (0.007)	-0.036*** (0.006)	-0.024*** (0.008)
20	-0.029*** (0.003)	-0.053*** (0.008)	-0.037*** (0.006)	-0.029*** (0.006)	0.010 (0.008)
21	-0.036*** (0.003)	-0.055*** (0.007)	-0.044*** (0.006)	-0.035*** (0.006)	-0.004 (0.008)
22	-0.060*** (0.003)	-0.077*** (0.007)	-0.066*** (0.007)	-0.060*** (0.007)	-0.039*** (0.008)
23	-0.075*** (0.003)	-0.092*** (0.008)	-0.087*** (0.007)	-0.072*** (0.006)	-0.045*** (0.008)
24	-0.038*** (0.004)	-0.075*** (0.009)	-0.037*** (0.007)	-0.016** (0.008)	-0.009 (0.009)
25	-0.125*** (0.003)	-0.131*** (0.008)	-0.135*** (0.008)	-0.122*** (0.007)	-0.112*** (0.009)
26	-0.104*** (0.003)	-0.122*** (0.008)	-0.114*** (0.007)	-0.103*** (0.006)	-0.078*** (0.008)
27	-0.087*** (0.003)	-0.110*** (0.007)	-0.099*** (0.007)	-0.080*** (0.006)	-0.054*** (0.008)
28	-0.006** (0.003)	-0.012 (0.008)	0.004 (0.007)	-0.006 (0.006)	0.006 (0.007)
29	-0.060*** (0.003)	-0.059*** (0.007)	-0.063*** (0.007)	-0.059*** (0.006)	-0.046*** (0.007)
30	-0.069*** (0.003)	-0.076*** (0.007)	-0.074*** (0.007)	-0.073*** (0.006)	-0.037*** (0.008)
31	-0.023*** (0.004)	-0.035*** (0.009)	-0.033*** (0.008)	-0.018*** (0.007)	0.001 (0.010)
Observations	1,482,887	251,280	297,468	330,056	209,681
Lottery Outlets	2,504	418	489	534	357

a. This regression includes lottery prize size and fixed effects for outlet, year, month, weekday and holidays. *, **, *** denote statistical level of 10%, 5% and 1% respectively. In parentheses appear robust standard errors.
b. The social economic cluster is not available for 706 lottery outlets (394,402 observations).

Table 7: A placebo test-the effect of original social security payday on gambling revenues
(The dependent variable: log daily gambling revenues)[a]

	(1)	(2)	(3)
Original Social Security Paydays[b]	-0.005 (0.004)	-0.005 (0.004)	**-0.030***** **(0.004)**
1st	**0.012***** **(0.002)**	**0.013***** **(0.002)**	**-0.019***** **(0.002)**
10th	**0.067***** **(0.002)**	**0.069***** **(0.002)**	**0.065***** **(0.002)**
Last Day of the Month		**0.036***** **(0.002)**	**0.009***** **(0.002)**
Prize Size (NIS millions)			**0.014***** **(0.000)**
Observations Lottery outlets[c]	1,434,108 2,427	1,434,108 2,427	1,434,108 2,427

a. This regression includes fixed effects for outlet, year, month, weekday and holidays. *, **, *** denote statistical level of 10%, 5% and 1% respectively. In parentheses appear robust standard errors.
b. Due to non-Jewish holidays the actual social security paydays were moved a few days earlier.
c. This regression excludes outlets that are located in non-Jewish statistical areas.

Table 8: The effect of actual paydays on gambling revenues by Socio-Economic Cluster
(The dependent variable: log daily gambling revenues)[a]

	Socio-economic cluster 2015[b]				
	All	1-3	4-5	6-7	8-10
Long Term Allowances	**0.078*** (0.002)**	**0.092*** (0.006)**	**0.089*** (0.005)**	**0.073*** (0.004)**	**0.063*** (0.006)**
Income Support	**0.061*** (0.002)**	**0.070*** (0.005)**	**0.070*** (0.005)**	**0.059*** (0.004)**	**0.036*** (0.006)**
Unemployment Benefits	**0.026*** (0.002)**	**0.037*** (0.005)**	**0.032*** (0.005)**	**0.026*** (0.004)**	**0.024*** (0.005)**
Children Allowance	**0.024*** (0.002)**	**0.016*** (0.005)**	**0.020*** (0.004)**	**0.022*** (0.004)**	**0.036*** (0.005)**
1st	**-0.010*** (0.002)**	0.005 (0.005)	**-0.012** (0.005)**	**-0.014*** (0.005)**	**-0.014*** (0.005)**
10th	**0.073*** (0.002)**	**0.080*** (0.006)**	**0.074*** (0.005)**	**0.067*** (0.004)**	**0.056*** (0.005)**
Last Day of the Month	**0.018*** (0.002)**	**0.027*** (0.005)**	**0.018*** (0.005)**	**0.021*** (0.005)**	**0.017*** (0.006)**
Observations	1,482,887	251,280	297,468	330,056	209,681
Lottery outlets	2,504	418	489	534	357

a. The regressions include lottery prize size and fixed effects for outlet, year, month, day of the week and holidays. *, **, *** denote statistical level of 10%, 5% and 1% respectively. In parentheses appear robust standard errors.
b. The social economic cluster is not available for 706 lottery outlets (394,402 observations).

Figure 1a: Estimated coefficients by calendar day relative to 14th of the month
(Based on table 6: column 1)

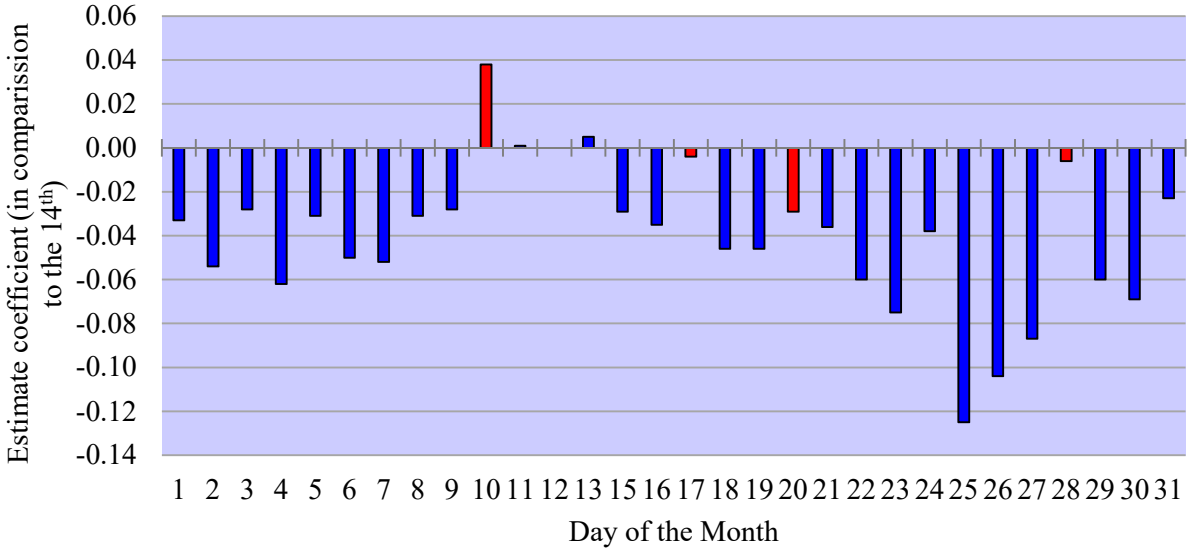


Figure 1b: Estimated coefficients by calendar day relative to 14th of the month
(Based on table 6: column 2)

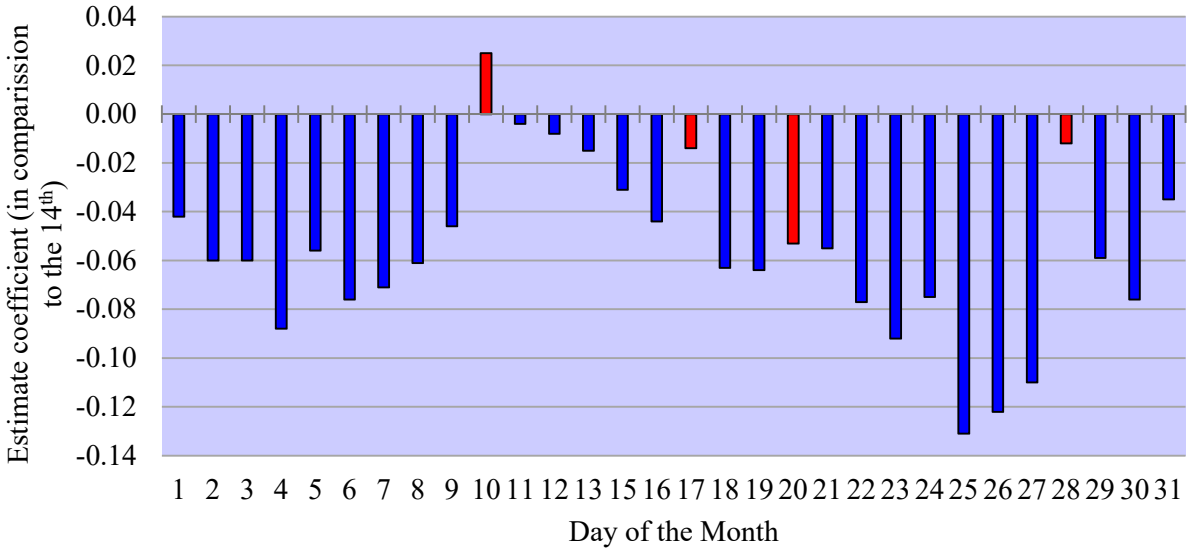
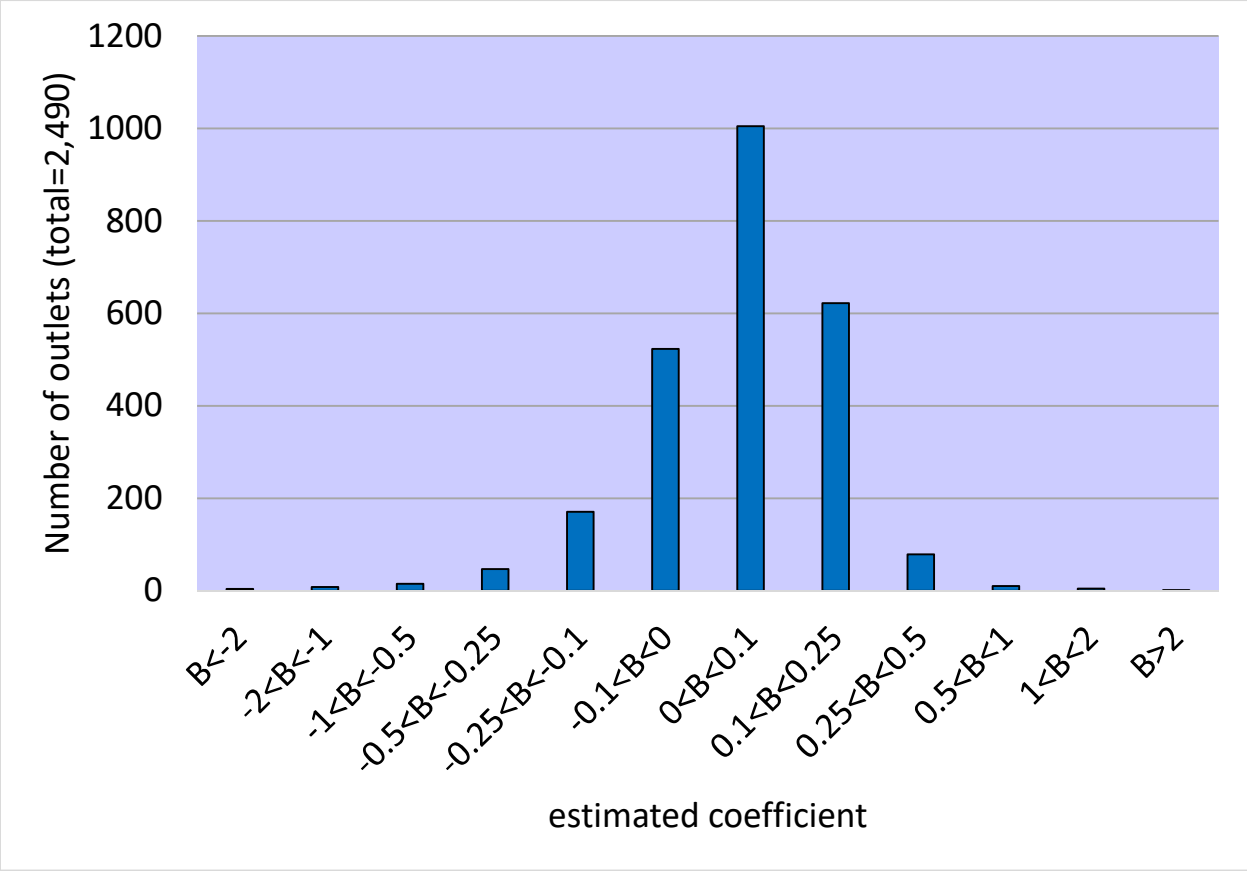


Figure 2: The distribution of *Income Support* payday coefficient, by lottery outlet



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