Save, Gamble, or Both? The Relationship between Premium Bond Sales and Lottery Sales in the United Kingdom

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SAVE, GAMBLE, OR BOTH? THE RELATIONSHIP BETWEEN PREMIUM BOND SALES AND LOTTERY SALES IN THE UNITED KINGDOM

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ABSTRACT

Four out of every ten Americans are unable to pay for an unexpected $400 bill out of their savings accounts. To ameliorate this problem, one policy to incentivize saving is a Prize-Linked Savings Account (PLSA). Unlike a traditional savings account that pays out a consistent rate of return, a PLSA pools the interest on all deposits and distributes the returns in randomly drawn prizes (similar to a lottery). However, PLSAs remain illegal in many areas due to a concern that the introduction of a private or public PLSA could cannibalize revenue from an existing state-sponsored lottery, thus restricting the state's ability to generate revenue for "good causes" like infrastructure and education. This undergraduate research article focuses on the relationship between Premium Bond sales, a PLSA run by the United Kingdom, and lottery sales in the UK. The empirical results reveal that Premium Bonds and lottery sales have no statistical or economic relationship, which implies that a state may be able to legalize PLSAs to incentivize saving without experiencing a reduction in state lottery revenue. This research provides important policy implications for the state of Mississippi, which battles high poverty and has also recently introduced a state lottery.

I. Introduction

A consumer faces the decision of whether to spend her income now or save it for later. This balance is found in the act of consumption smoothing where individuals maximize their utility over time by saving when rich and consuming when poor. Periods of "relative poorness" often come as a surprise, and the preparedness of consumers has decreased over time. For example, in 2019 four out of every ten Americans were unable to pay for an unexpected $400 bill out of their savings accounts.[1] In addition, the personal savings rate (the percent of income that is saved) in the United States decreased from 13.1 percent in 1970 to a record low 2.6 percent in January 2005.[2] From 2010 to 2020, the US had an average personal savings rate of 7.2 percent. Compared to other developed countries, the US has a lower personal savings rate: in that same period, for example, the UK recorded 8.3 percent, Sweden recorded 13.5 percent, and citizens in Switzerland saved 16.9 percent of their household income.[3] The downward trend and relatively low level of the US savings rate poses a serious problem to the financial health of both an economy and the individual consumer.

At the national level, an increase in domestic savings contributes to the long-term growth of an economy.[4] Mistzal (2011) demonstrates that this relationship between a higher savings rate and a higher long-term growth rate is consistent across countries regardless of a country's level of development. AbuAl-Foul (2010) notes that savings influence the long-term opportunities for growth in an economy. This theory states that an increase in savings can result in an increase in investment that allows for capital purchases like buildings and machines. This then increases firms' productivity with the same amount of labor. Thus, it is predicted that a policy that incentivizes saving could positively affect the long-term growth of a country.

In addition to decreasing overall economic growth, a decline in the personal savings rate can indicate an individual's decreased financial health. This problem is exacerbated in the United States where personal savings rates have not been constant across income level.[5] Dynan (2000) shows that fluctuations in savings rates in the short term disproportionately and negatively affect low-income households. When faced with uncertainty in the economy, households of all income levels will increase savings, but low-income households are less able to reduce their consumption: they must focus a greater share of their income on necessary goods such as groceries and healthcare compared to high-income households that spend a greater share of income on discretionary goods and services such as travel and recreation.[6,7] Dynan (2000) also demonstrates that since 1950, high-income households consistently save a greater portion of their income than low-income households, and

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[1] Source: federalreserve.gov/publications/2019-economic-well-being-of-us-households-in-2018-dealing-with-unexpected-expenses.htm

[2] Source: fred.stlouisfed.org/series/PSAVERT

[3] Source: statista.com/statistics/246296/savings-rate-in-percent-of-disposable-income-worldwide/

[4] Source: Mistzal (2011), AbuAl-Foul (2010), and Weinstock (2020)

[5] Source: bea.gov/data/income-saving/personal-saving-rate

[6] Source: investopedia.com/terms/s/savings-rate

[7] For example, the personal savings rate rose drastically during the Covid-19 pandemic, increasing from 12.7 percent to a record 32.2 percent from March 2020 to April 2020. However, the savings rate increase disproportionately affected wealthy consumers.[7] In April of 2020, high-income consumers reduced their spending by 36.1 percent, while low-income consumers only reduced spending by 28.9 percent. This disparity remained consistent through the pandemic. Source: tracktherecovery.org/

this contributes to poverty and wealth inequality. The personal savings rate can reflect the financial health of individuals in an economy, and its fluctuations across income levels reflect that poorer households are less able to prepare for or react to a crisis.

When implementing a PLSA, a government may want to know if its PLSA sales could cannibalize their revenue from an already-established lottery. A PLSA would encourage individual savings for low-income households, but lottery revenues also fund important social programs like education and infrastructure.[8] To date, there has been little work on this potential tradeoff. This article examines the effect of lottery sales on Premium Bond sales and vice versa in the United Kingdom from 1995-2020 through the use of Granger causality tests. The tests provide loose evidence on the degree of substitutability or complementarity between Premium Bonds and lottery tickets. If the two are found to be substitutes, then this reveals consumers tend to choose one over the other rather than spend more on both. If PLSAs and lottery sales are complements, then consumers may spend money on both a PLSA and a lottery and a policymaker may not face the tradeoff problem.

The saving disparity is most concerning for regions with a high level of poverty such as Mississippi. Mississippi is the poorest state in the country: the real per capita personal income in Mississippi in 2021 was $44,128 compared to $62,215 nationally.[9] Not only are Mississippi residents on average poorer than the rest of the nation but they also save a smaller portion of their income. From 2011 to 2020, the personal savings rate in Mississippi was 3.9 percentage points lower than the national average over the same period.[10] This may suggest that Mississippi residents spend a larger portion of their income on necessity goods and that incentives for individuals to save a greater percentage of their income could produce positive long-term outcomes both for the individual and the state.

Given the low savings rate among low-income households, one policy to incentivize saving for households is a Prize-Linked Savings Account (PLSA).[11][12] Unlike a traditional savings account that pays out a minimal and consistent rate of return, a PLSA pools the interest collected on all deposits and distributes the interest in the form of randomly drawn prizes. For example, a consumer deposits $100 into her Prize Linked Savings Account. Every month, she would forego a guaranteed return of $0.55 and instead be given a 1 in 18,182 chance of winning $10,000.[13][14] The consumer can

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[8] Source: Clotfelter et al. (1999)

[9] Source: apps.bea.gov/iTable/iTable.cfm?reqid=99&step=1&acrdn=3

[10] There is no published data on personal savings rates by state, but data from the Bureau of Economic Analysis was used to calculate these personal savings rate using per capita personal income and per capita expenditures for both the US and Mississippi. Source: apps.bea.gov/iTable/iTable.cfm?reqid=70&step=1&acrdn=2

[11] Source: congress.gov/bill/113th-congress/house-bill/3374

[12] Definitions on terms used throughout:

Savings Account: A consumer puts cash in a savings account and can withdraw at any time. Sometimes, the account will earn a very small amount of interest.

Lottery: A consumer buys a lottery ticket and gains a small chance at winning a large prize. If the consumer does not win, the ticket is worthless.

Bond: A consumer buys a bond from an entity (usually a government or large company). The bond pays the consumer interest over a term, and at the end of the term the consumer receives back the original investment.

[13] These are sample numbers, calculated so a risk-neutral agent would be indifferent.

[14] Similar to Pfiffelmann (2007).

generally withdraw her funds at any time, though some programs impose small penalties on withdrawals within one year to encourage longer-term saving habits. These forms of special savings accounts have been offered at isolated credit unions primarily in Michigan and Wisconsin and have been shown to increase deposits.[15] However, large-scale availability of PLSAs in the United States is hindered by legislation that restricts their legality to local credit unions.

Other countries have been more successful in implementing and maintaining PLSAs. The United Kingdom has the longest-running PLSA system through their issuing of Premium Bonds that have remained in great demand since their inception in 1956. The First National Bank of South Africa ran a PLSA called the "Million a Month Account" until it was shut down by the national government for competing with the state-run lottery system.[16] In fact, PLSAs are illegal in many areas because they are classified as gambling and only the state has authority to regulate and operate gambling. This idea of PLSA competition against other state revenue sources poses the greatest barrier to wide-spread institution of PLSAs. Governments find themselves wary of jeopardizing the consistent revenue stream from the lottery.

In order to examine the relationship between PLSAs and government lotteries and how PLSAs may or may not provide an economic benefit to a state like Mississippi, Section II discusses the history of PLSAs in both the United States and the United Kingdom, reviews the work already done on the subject of PLSAs and lotteries, and emphasizes how this project contributes to the literature. Section III outlines the data collection process and presents general and specific models of the regressions. Section IV presents results and discusses the interpretation of the regression analysis. Section V concludes the article with a review of the hypothesis, methodology, and results, as well as policy implications.

II. History and Literature Review

Before presenting evidence on the relationship between U.K. Premium Bond sales and U.K. National Lottery sales, it is important to first understand the history of both and previous academic research. This section provides a brief history of the U.K. National Lottery, U.K. Premium Bonds, and prize-linked savings accounts in the United States.

A. The U.K. National Lottery and Premium Bonds

Beginning in 1698, national lotteries were illegal by default in the United Kingdom until 1994, although smaller state lotteries had been used to finance war costs and provide for "good causes."[17] In 1994, Prime Minister John Major laid the groundwork for a national lottery to support good causes and generate revenue for the state. He awarded the National Lottery franchise to Camelot Group, a private operator. The first drawing of the National Lottery took place on

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[15] Source: Atalay et al. (2014) and Kearney et al. (2010).
[16] Source: Cole et al. (2007), allafrica.com/stories/200803311066.html
[17] Source: Murden (2016)

November 19, 1994.[18] Camelot has added new games and rebranded old games to invigorate demand, but the original "Lotto" game remains by far the most popular with over $78 billion in ticket sales from 1995 to 2020.[19] However, as popular as the Lotto has become, its sales are still dwarfed by the much older system of Premium Bonds.

After the Second World War, U.K. Prime Minister Harold MacMillan faced a country with rising inflation, a low personal savings rate, and lingering war costs. In 1956, he proposed the institution of Premium Bonds where for every £1 bought, investors forewent guaranteed interest and were instead entered in a monthly drawing for different tiers of monetary prizes. According to MacMillan, Premium Bonds targeted "those members of the community who are not attracted by the reward of interest, but do respond to the incentive of fortune."[20] The system had been previously considered but was discarded forty years prior during World War I. Despite criticism from religious groups and both houses of Parliament, Premium Bonds went on sale on November 1, 1956. They were a great success: a £1 minimum investment and £1,000 top prize generated £5 million in sales on the first day.[21] The top prize was steadily increased until 1994, when the grand prize reached £1 million in an effort to compete with the new National Lottery. To date, 21.1 million people – almost a third of the U.K. population – hold over £113 billion in Premium Bonds that pay almost £100 million in prize money every month.[22]

The popularity of Premium Bonds has generated academic interest. The majority of economic analysis has been done by De Neve et al. (2008) who examine demand determinants for Premium Bond sales. They note that annual net sales are positively correlated with higher grand prizes, implying that Premium Bonds provide gambling utility similar to a lottery. Additionally, the expected prize rate on Premium Bonds is generally lower than rates on other government bonds, suggesting that investors are willing to pay for the excitement of risk offered by Premium Bonds. Kearney et al. (2010) analyze the U.K.'s Family Resource Survey that offers insights into the types of households that hold Premium Bonds. They note that the quantity of Premium Bonds demanded increases with income and that the appeal of Premium Bonds relative to other investments is highest in low-income households. To date, no research has examined the relationship between Premium Bond sales and U.K. National Lottery sales.

B. Prize-Linked Savings Accounts in the United States

While PLSAs have enjoyed a long tenure in the U.K. in the form of Premium Bonds, attempts at forming a widespread counterpart in the United States have often been cut short by a complicated legal landscape. Kearney et al. (2010) provide the most comprehensive history of the first American PLSAs and note that they have been offered in some form for over three centuries.

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[18] Source: news.bbc.co.uk/onthisday/hi/dates/stories/may/25/newsid_2502000/2502883.stm
[19] Source: lottery.merseyworld.com/cgi-bin/lottery?sales=1&year=0&display=NoTables
[20] Source: web.archive.org/web/20081204082245/http://www.nsandi.com/press-room/premiumbonds50/history_pb.jsp
[21] About £133,000,000 in 2022 pounds.
[22] Source: nsandi-corporate.com/news-research/news/premium-bonds-are-65-monday-and-bigger-ever-more-113-billion-bonds-eligible#

These programs have generally been offered by private institutions, but the state of Maryland experimented with their own version of Premium Bonds in 1975. In the early stages of development, the state was dissuaded from the effort by a legal opinion ruling that the program was essentially a "cloaked lottery" and "would be subject to existing lottery laws" including a limitation on using banks to sell the bonds.[23] The state would have to rely on lottery sales agents accustomed to receiving commission that could not be paid in a Premium Bond-style offering. The state's staunch restrictions on lotteries ultimately prevented the public offering of the bonds.

More recently, private institutions have attempted to offer PLSAs. The Doorways to Dreams Foundation (D2D, now known as Commonwealth) was founded in 2001 with the goal to "help millions of people make thousands of dollars" as opposed to "help[ing] thousands of people make millions of dollars."[24] In 2006, D2D assisted the Centra Credit Union in Centra, Indiana, in launching the *Super Savings* program. In the first three months, Centra had enrolled over 1,300 customers in the program and amassed $500,000 in deposits. The program was classified as a no-purchase-necessary sweepstakes as a loophole to the restrictive Indiana state law that designates PLSAs as illegal private lotteries. However, the credit union was only able to enroll customers from the local Centra area. Ultimately, the program's limited geographic scope prevented both the offering of a large grand prize and the long-term success of the program.

Three years later, the D2D Foundation capitalized on another legal loophole and helped organize eight credit unions in Michigan to form the *Save to Win* program. Under Michigan state law, credit unions were allowed to offer "savings promotions raffles," but these raffles were still restricted to local areas.[25] Because its geographic reach was broader than the Centra Credit Union experiment, the Michigan credit unions were able to offer a $100,000 grand prize to be awarded at the end of 2010. They enrolled 11,600 customers and amassed $8.6 million in deposits. The *Save to Win* customers were invited to complete a survey in which fifty-six percent of respondents reported spending money on the lottery in the last six months and fifty-six percent also reported that they had not regularly saved money.[26] While *Save to Win* was more successful than Centra Credit Union's *Super Savings*, they were both limited in geographic scope due to legal restrictions.

Since 2010, the legal landscape surrounding PLSAs in the US has changed significantly. Lobbying efforts from Commonwealth and other non-profits resulted in the bipartisan passage of the American Savings Promotion Act in 2014 that opened the door for individual states to legalize PLSAs. Since the passage of the Act, institutions in 33 states have begun offering PLSAs in various forms.[27, 28, 29] Research on American PLSAs is limited due to their short periods of existence, but some work has been done. Tufano (2008) notes that the size of the grand prize is a strong positive determinant for consumer demand in PLSAs, and De Neve et al. (2011) report that potential interest for PLSAs is highest among non-savers and gamblers. Outside the available data from recent

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[23] Source: Phillips (1975)
[24] Source: ft.com/content/92ffdee2-7578-11e4-b1bf-00144feabdc0
[25] Source: legislature.mi.gov/doc.aspx?mcl-490-411
[26] Source: Kearney et al. (2010)
[27] Source: businessinsider.com/house-passes-american-savings-promotion-act-2014-9
[28] Source: thebalance.com/what-are-prize-linked-savings-accounts-4587608
[29] This expansion is detailed in Cookson (2018).

programs, Filiz-Ozbay et al. (2013) find in lab experiments that lottery-style payments induce individuals to save. Kearney et al. (2010) note that "One consideration we have not discussed thus far is what effect, if any, the availability of prize-linked saving products might have on traditional lottery demand." This article provides the first empirical evidence on the economic relationship between lottery sales and PLSA sales in the United Kingdom.

III. Data and Empirical Methodology

This section presents the data and empirical methodology used to analyze the relationship between lottery sales and Premium Bond sales in the U.K. All sales data are quarterly and cover the period Q1 1995 to Q4 2020 for a total of 104 observations.

Lottery sales data are quarterly sales in U.K. pounds for the National Lotto game. Other lottery games are offered in the U.K., but the National Lotto is the only game that has run continuously since 1994. The data was obtained from an unofficial site that includes sales for the National Lotto on its Wednesday and Saturday draws beginning in 1994.[30] This data was summed to arrive at quarterly totals and were then adjusted for inflation using the United Kingdom CPI (base 2014).[31] Finally, the data was divided by population to yield a final measure of real per capita sales.

Premium Bond sales data are all Premium Bonds sold from the National Savings & Investments to investors in U.K. pounds in a quarter.[32, 33] This data was acquired from a Freedom of Information Act request then adjusted for inflation and population in a similar manner to lottery sales in order to yield a measure of real per capita Premium Bond sales. Table 1 provides descriptive statistics for these variables, and Figure 1 plots the variables over the sample period.

Table 1 – Descriptive Statistics

Variable	Mean	Median	Standard Deviation	Min	Max
Real per capita Lottery Sales	£15.20	£13.06	£6.88	£6.30	£30.66
Real per capita Premium Bonds	£35.69	£29.94	£18.14	£9.99	£105.01

Note: Quarterly data from Q1 1995 : Q4 2020, 104 observations.

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[30] Source: lottery.merseyworld.com/cgi-bin/lottery?sales=1&year=0&display=NoTables
[31] Source: statista.com/statistics/306648/inflation-rate-consumer-price-index-cpi-united-kingdom-uk/#:~:text=The%20inflation%20rate%20for%20the,negative%200.1%20percent%20in%202015.
[32] NS&I is an executive agency of Her Majesty's Treasury.
[33] Source: nsandi.com/products/premium-bonds

Figure 1 – PLSA and Lottery Sales over Time
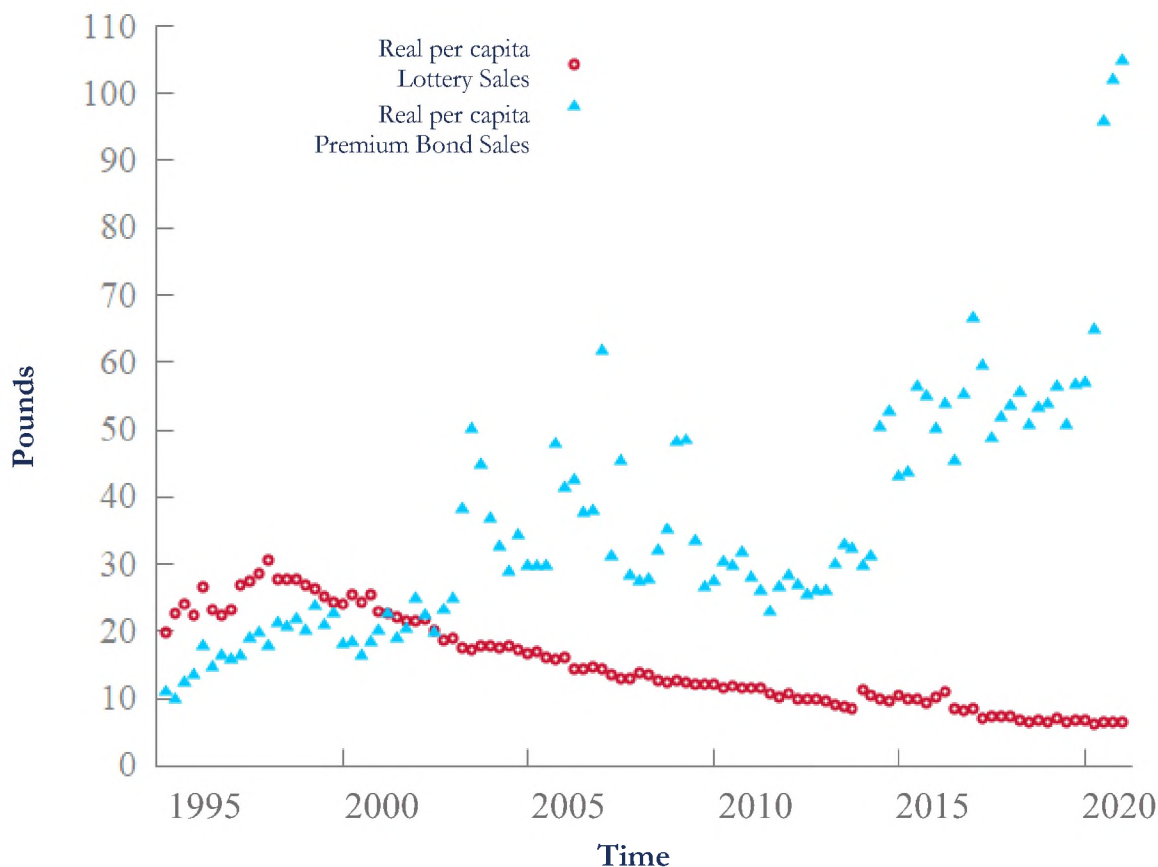
The data in Figure 1 reveals that lottery ticket sales have fallen over time whereas Premium Bond sales have risen. This visual evidence suggests that the two goods are negatively correlated, but beyond this visual inspection it is difficult to make conclusions about any statistical causal relationship between the variables. To analyze the statistical relationship between lottery ticket sales and Premium Bond sales, the following time-series regressions are estimated

$$Premium\ Bonds_t = \tau_0 + \sum_{i=1}^{3}(\gamma_i)Premium\ Bonds_{t-i} + \sum_{i=1}^{3}(\phi_i)Lottery\ Sales_{t-i} + \epsilon_t \quad (1)$$

$$Lottery\ Sales_t = \alpha_0 + \sum_{i=1}^{3}(\alpha_i)Lottery\ Sales_{t-i} + \sum_{i=1}^{3}(\beta_i)Premium\ Bonds_{t-i} + \epsilon_t \quad (2)$$

where *Premium Bonds*$_t$ is real per capita Premium Bond sales in quarter *t* and *Lottery Sales*$_t$ is real per capita Lotto sales in quarter *t*. Regression (1) denotes *Premium Bonds*$_t$ as a function of three lagged values of *Premium Bonds* and three lagged values of *Lottery Sales*. Regression (2) denotes *Lottery Sales*$_t$ as a function of three lagged values of *Lottery Sales* and three lagged values of *Premium Bonds*. The regression also includes a time trend variable and quarterly dummies for Q1, Q2, and Q3. The

time trend variable accounts for the long-run trend in both series' sales as seen in Figure 1, and the quarterly dummies account for seasonal differences in sales.

        After these regressions are estimated, Granger causality tests are conducted. The Granger causality tests are done by restricting each regression's dependent variable to only depend on its own lags as explanatory variables and then using an F-test of the R^2s of regressions (1) and (2) to determine joint significance. Specifically, for regression (1), the test will determine if the inclusion of lagged values of Lottery Sales better predicts *Premium Bonds$_t$* than if the lagged values were excluded. Similarly, for regression (2) the test will determine if the inclusion of lagged values of Premium Bonds better predicts *Lottery Sales$_t$* than if the lagged values were excluded. If coefficients β_1, β_2, β_3, ϕ_1, ϕ_2, or ϕ_3 are statistically significant, then their signs may provide evidence about the relationship between Premium Bond sales and lottery sales. Negative coefficients may suggest a substitutional relationship while positive coefficients may suggest a complementary relationship. It is important to note that this methodology only compares changes in the quantities sold of the two goods; in order to accurately estimate the substitutability or complementarity between Premium Bonds and Lottery tickets, one would need to estimate how the quantity of one good is affected by a change in the price of the other good, and vice versa.

IV. Empirical Results

        The empirical results are shown in Table 2. First consider the Premium Bond regression results shown in column 1. Premium Bond sales are significantly affected by the sales of Premium Bonds in the previous quarter. The coefficient suggests that a £1 increase in Premium Bond sales is associated with a £0.77 increase in Premium Bond sales in the next quarter. Conversely, a £1 decrease in Premium Bond sales is associated with a £0.77 decrease in Premium Bond sales in the next quarter. The positive coefficient on the time trend variable reflects the general increase in Premium Bond sales over time as seen in Figure 1, suggesting per capita sales have increased by £0.22 per quarter on average. These findings are consistent with De Neve et al. (2008).

Table 2 – Regression Results

Variable	(1) Dependent Variable: Premium Bonds$_t$	(2) Dependent Variable: Lottery Sales$_t$
Constant	−12.078 (11.176)	2.910 * (1.501)
Premium Bonds $_{t-1}$ (i)	0.7710 *** (.1057)	-0.004 (.0140)
Premium Bonds $_{t-2}$ (ii)	0.1098 (.1329)	0.0108 (.0179)
Premium Bonds $_{t-3}$ (iii)	−0.0536 (.1184)	−0.004 (.0160)
Lottery Sales $_{t-1}$ (iv)	−0.1017 (.7721)	0.679 *** (.1037)
Lottery Sales $_{t-2}$ (v)	0.9014 (.9306)	0.1937 (.1250)
Lottery Sales $_{t-3}$ (vi)	−0.2984 (.7198)	0.0221 (.0967)
Q1	−0.8250 (2.188)	−0.1891 (.2939)
Q2	−0.3334 (2.204)	−0.6821 ** (.2960)
Q3	0.5178 (2.199)	−0.3681 (.2954)
Time Trend	0.2155 ** (.1073)	−0.0247 * (.0144)
Adjusted R²	0.8151	0.9774
F-Test for Joint Significance of (i), (ii), and (iii) in (1) (p-value)	–	0.4452 (0.9308)
F-Test for Joint Significance of (iv), (v), and (vi) in (2) (p-value)	2.4804 (0.4788)	–

Standard errors in parentheses. * ** *** denote significance at 10%, 5%, and 1% respectively.
Sample period Q1 1995 : Q4 2020, 104 observations. All variables are in real per capita terms.

Now consider the lottery sales regression results shown in column 2. Lottery sales are significantly affected by lottery sales in the previous quarter, the Q2 seasonal dummy variable, and the time trend variable. For lottery sales in the previous quarter, the coefficient suggests that a £1 increase in lottery sales is associated with a £0.68 increase in lottery sales in the next quarter. Conversely, a £1 decrease in lottery sales is associated with a £0.68 decrease in lottery sales in the next quarter. The negative coefficient on the time trend variable reinforces the visual evidence in Figure 1 that lottery sales have declined over time, suggesting per capita sales have decreased by £0.02 per quarter on average. This result is consistent with declining demand for the Lotto game as well as demand cannibalization as newer lottery games have been introduced over time.[34] Additionally, per capita sales in the second quarter (April to June) are generally lower by £0.68 compared to Q4 which implies there exists some seasonal effect on lottery demand.

The F-test is the Granger causality test that is used to determine any statistical relationship between lottery sales and past Premium Bond sales and vice versa. Recall the null hypotheses: for lottery sales, the null is that the inclusion of lagged Premium Bond sales does not significantly

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[34] Cannibalization of lottery revenues in the U.K. has been extensively studied by Nikkinen and Marionneau (2018).

predict future lottery sales. Similarly, for Premium Bonds, the null is that the inclusion of lagged lottery sales does not significantly predict future Premium Bond sales. As seen in the last rows of Table 2, the null hypotheses cannot be rejected, thus revealing there is no statistical relationship between lottery sales and Premium Bond sales, and therefore suggests that there is no significant economic relationship between lottery sales and Premium Bond sales.

V. Summary and Conclusions

Household saving directly influences the long-term growth of a country and the financial health of the individuals in that country. Furthermore, high-income households generally save a greater percentage of income relative to low-income households, thus leaving low-income households more vulnerable to financial crises. Thus, it is reasonable to suggest that a policy that incentivizes saving, specifically saving among low-income households, could benefit regions with relatively high levels of poverty such as Mississippi.

A Prize-Linked Savings Account (PLSA) pays its interest in the form of randomly drawn lump sum prizes. The United Kingdom established the Premium Bond in 1956, and the program has been successful in incentivizing savings among previously unbanked populations. Efforts to establish PLSAs in the United States have ceased as a result of legal complications that allow the state to maintain a monopoly on lottery-style products. Many of these policies are driven by the belief that the introduction of a private or public PLSA could cannibalize revenue from an existing state-sponsored lottery, thus restricting the state's ability to generate revenue for public works projects like infrastructure and education.

This article investigated the potential public works tradeoff problem by exploring the statistical relationship between PLSA sales and lottery sales in the United Kingdom. Specifically, Granger causality tests were conducted using real per capita lottery sales and real per capita Premium Bond sales in the U.K. over the period 1995 – 2020. The null hypotheses of these Granger causality tests cannot be rejected, thus implying that there is no statistical relationship between Premium Bond sales and lottery sales over time.

These results imply that a state may be able to legalize PLSAs to incentivize saving without experiencing a reduction in state lottery revenue. This policy implication is of particular importance in Mississippi because the state has the poorest residents in the country and implemented a state-wide lottery in August 2018.[35] The implementation of a state-wide PLSA could offer consumers the gambling value of a lottery and also incentivize saving in low-income households.[36]

Further research could compare the net benefits of lotteries and PLSAs. Lotteries provide the funding for good causes but do not encourage saving. PLSAs provide benefit by incentivizing household saving among the poor, but their classification as a bond provides less direct funding to the state. If these two net benefits can be sufficiently quantified, then the state could make an informed decision on which product could better serve the needs of its lower-income residents. This article's research could also be expanded to investigate individual-level consumer preferences or

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[35] Source: mslotteryhome.com
[36] Source: Oster (2004)

broadened geographically to areas outside the United Kingdom to provide further evidence on the complementarity and substitutability of the two goods. This research would require data on changes in the price of lottery tickets and Premium Bonds to determine if a change in the price of one good affects the demand of the other. Even though PLSAs are a relatively young financial instrument, data on their sales is becoming more and more readily available as financial institutions and governments around the world seek research on the new product. These opportunities present a promising outlook for those wishing to further study Prize-Linked Savings Accounts.

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