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Income and Lottery Sales: Transfers Trump Income from Work and Wealth

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Abstract

The effect of income on lottery expenditures has generally been studied using an aggregate measure of income, usually personal income. Reasons exist for thinking that lottery expenditures do not respond equally to all sources of income. This paper examines lottery spending and income from three sources, namely income from earnings, wealth, and transfer payments. Using county-level data for five states and controlling for demographic and other characteristics, we find that each source of income has a different effect on lottery ticket expenditures. A noteworthy finding is that purchases are most strongly influenced by changes in transfer payments. Several policy implications follow from our results.

Keywords: State lottery, consumption, propensity to consume, income
JEL Codes: H71, H31

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Income and Lottery Sales: Transfers Trump Income from Work and Wealth

I. Introduction

Growth in the nearly $50 billion a year state lottery industry over the past 40 years has sparked much research on the demand for lottery tickets.[1] Studies have explored the effects of the economic and demographic characteristics of lottery players on lottery ticket purchases, such as educational attainment, employment status, age, and race. The literature has given the greatest attention to the relationship between player income and lottery ticket purchases to determine the tax incidence (i.e., the regressivity or progressivity) of state lotteries (Clotfelter and Cook, 1987, 1989; Scott and Garen, 1994; Hansen, 1995; Farrell et al. 1999; Price and Novak, 1999; Forrest et al., 2000; Kearney, 2005; Garrett and Coughlin, 2007).[2] In the present paper we examine the relationship between income and ticket purchases; however, we focus not on the tax incidence issue, but rather on the connection between different sources of income and lottery ticket purchases.

Past studies of lottery demand have typically used an aggregate measure of income such as personal income, which, according to Bureau of Economic Analysis classifications, is broadly composed of earnings income, wealth income, and transfer payment income (which itself is broken down into numerous sub-categories). The use of aggregate personal income in models of lottery demand assumes that lottery expenditures respond the same to a $1 increase in transfer income as they do to, say, a $1 increase in

[1] Beginning with New Hampshire in 1964, forty-two states and the District of Columbia have since legalized state-sponsored lotteries. Lottery ticket sales in the United States topped $48 billion in fiscal year 2006 (roughly $160 per capita), of which state governments retained nearly $17 billion (about 1 percent of total state government revenue) for spending on education, infrastructure, and other programs.

[2] This is not a complete list of all lottery demand studies. See the above studies for additional references. The majority of research has shown that state lotteries can be characterized as a regressive form of taxation.

earnings income. In other words, the marginal spending on lottery tickets is the same across income sources. Reasons exist for skepticism concerning this implicit assumption.

In addition to personal income as an explanatory variable, models of lottery expenditures include variables that account for the relative size of various demographic groups within the population. These demographic characteristics are related to the shares of different income categories. For example, the share of transfer payment income for those aged 65 and above exceeds that of those who are younger. Thus, it seems reasonable to believe that lottery ticket expenditures respond to different income sources differently given that demographic groups rely on various income sources. Although past studies have included variables that account for the relative size of various demographic groups within the population, these variables simply indicate that the spending patterns of different groups vary. A primary goal of our study is to provide insights into differences in the marginal spending on lottery tickets by demographic groups, not just whether the size of each group is a significant determinant of lottery expenditures.

This paper examines the marginal spending on lottery tickets from various income sources, namely transfer payment income, wealth income, and earnings income. We use 2005 county-level data for five states in our analysis. Our hypothesis is that the effect of an additional $1 in income on lottery ticket expenditures is different depending upon the source of income. The foundations for our hypothesis, one which was mentioned in the preceding paragraph, can be found in various theoretical and empirical studies that are discussed more fully in the next section of the paper.

We find evidence that lottery ticket expenditures respond differently to changes in various income sources. Specifically, marginal spending on lottery tickets from transfer payment income differs from earnings and wealth income. Additional results suggest that the impact of transfer payments is not limited to retirement benefits; transfer payments associated with income maintenance are statistically significant nearly as often as retirement benefits. Our results suggest that previous models of lottery demand that only considered an aggregate measure of income fail to capture important differences in spending patterns by different demographic groups. In addition, the finding that spending on lottery tickets differs by income source has implications for state lottery revenue forecasting as well as raising normative issues regarding the efficiency of state lottery finance and the state programs that are funded by state lottery revenue.

II. Why Marginal Spending on Lotteries Might Differ Across Income Sources

There are two reasons for expecting lottery ticket expenditures to respond differently to changes in different income sources. One explanation relies on the fact that the spending patterns of people with different types of income are different — an additional $1 to an average retiree, whose income consists of transfer payments to a far greater extent than an average worker, is spent differently than an additional $1 to a working individual. A second explanation is that people spend money from different sources differently — an additional $1 in social security benefits to a retiree is spent differently than an additional $1 in dividend income to the same retiree. The key distinction is that the former is an interpersonal comparison while the latter is an intrapersonal comparison. Even though these reasons are straightforward, it is useful to review the theory and evidence supporting these explanations.

Different Groups, Different Income Sources, and Different Spending Patterns

As we highlighted in the introduction, lottery spending is generally regressed on personal income and various demographic characteristics. These characteristics frequently have significant explanatory power, suggesting that lottery spending is related to the value of a demographic characteristic. At the same time, the shares of income across income sources by demographic characteristic vary. Information on the differences in income sources at the national level for various groups can be found in the *2006 Consumer Expenditure Survey (*CES).[3] The three demographic characteristics used in our analysis are age, race, and educational attainment.[4] A few examples follow in order to highlight the connection between income sources and demographic characteristics.

The most pronounced differences in sources of income are related to age. Differentiating between those aged 65 and older from those less than age 65, one finds the older group tends to have larger income shares accounted for by wealth and transfer payments and a smaller income share accounted for by earnings from work than the younger group.[5] For example, transfer payments account for 55.9 percent of the money income of the older group and 4.8 percent of the money income of the younger group. Differentiating between those who are black or African-American (CES classification) and those who are not, one finds only slight differences. For those who are black or African-American, the income shares accounted for by earnings from work and transfer

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[3] See www.bls.gov/cex.

[4] These variables are commonly included in lottery spending studies. Jackson (1994) and Hansen et al. (2000) are two of numerous examples. We also control for county unemployment. In terms of income shares, a higher unemployment rate would tend to reduce the share of earnings from work and increase the share of income from transfer payments.

[5] Our calculations are based on money income before taxes and treat two categories, which account for roughly one percent of money income, as unclassified. These categories are regular contributions for support and other income. Additional details are available upon request.

payments tend to be somewhat larger than those who are not black or African-American. This result also implies a relatively smaller share of income from wealth for the former group. For example, the share of money income from wealth was 0.5 percent for blacks or African-Americans versus 2.6 percent for those who are not. Finally, differentiating between those with at least a high school diploma from those who do not, one finds that the former group has relatively smaller shares of money income accounted for by earnings from work and from wealth and a larger share accounted for by transfer payments. For example, transfer payments were 23.4 percent of money income for those lacking a high school and 10.0 percent for those with at least a high school diploma.

In the present study the existence of differences in the sources of income across demographic groups is not the end of the story. In addition, for a specific characteristic, such as age, the spending on lottery tickets must also differ. In other words, those aged 65 and older must also buy lottery tickets at a different rate than those less than 65 years old. This result is already strongly indicated by the existing regression results involving lottery spending. More generally, much evidence exists that indicates that spending patterns vary with age. This evidence begins with life-cycle theories of consumption. For example, Fernández-Villaverde and Krueger (2007), using *Consumer Expenditure Survey* data, find significant humps over the life-cycle for both nondurable and durable expenditures. In another study using *Consumer Expenditure Survey* data, Paulin (2000) found numerous differences between the expenditure patters of older and younger consumers. Not surprisingly, health care spending is a larger share of total expenditures for those aged 65 and older than for those less than 65 years old.

Why Different Sources of Income Might Not Be Spent the Same by an Individual

A common presumption in most studies of spending and saving is that all income is the same. Standard theory (Friedman, 1957) suggests that income is fungible. In other words, a dollar of income is treated the same regardless of whether it was earned as the result of one's own labor, received as earnings stemming from one's wealth, or received as a transfer payment. Consequently, the source of the income should not affect one's spending or saving decisions. Nonetheless, economic theory as well as empirical studies raises doubts about this common presumption about the equality of marginal propensities to consume (MPC) out of different sources of income.

With respect to economic theory, either modifications of underlying assumptions or adding some constraints can eliminate the fungibility of different sources of income. One example of modifying underlying assumptions is Shefrin and Thaler's (1988) behavioral life-cycle model.[6] In this model, the way accounts are viewed or framed affects the extent to which the account affects spending. One formulation of this model uses three broad accounts — a current income account, an asset account, and a future income account. The temptation to spend from these accounts differs, with the MPC from current income having the highest value (close to one) and the MPC from future income have the smallest value (close to zero).

In addition to modifying the underlying assumptions related to human behavior, it is also possible to affect spending and saving behavior by altering the incentives to spend and save. Depending on the incentive, the impact might be on overall consumption or saving or on a specific consumption item or savings instrument. Given our focus on lotteries, an excellent example is provided by Laitner (1999), who explores the

[6] See also Thaler (1990).

connection of means tests for public assistance with gambling expenditures. Specifically, Laitner (1999) addresses why those with low incomes tend to spend more on gambling than those with high incomes. Public assistance programs may change the risk-taking behavior of those with low incomes so that they save significantly less relative to their permanent income than those unlikely to qualify for public assistance. Because recipients of public assistance can become ineligible for benefits if their assets exceed some threshold, their incentive to save is reduced. Moreover, they also have a strong incentive to participate in risky gambling activities, such as a lottery. The reasoning is straightforward. If the gambler wins the lottery, then the large payoff means the gambler no longer qualifies for public assistance. If the gambler loses, then public assistance reduces the cost of the lottery ticket to near zero. On the other hand, the incentive for those with high incomes to purchase lottery tickets is not affected by the means tests for public assistance.

In addition to the preceding theoretical arguments, a number of empirical studies conclude that the marginal propensity to consume various goods from different income sources is not the same. For example, in a study of farm families, Carriker et al. (1993) find differences in the propensity to consume from farm income, non-farm income, and government payment income. Hymans and Shapiro (1976) find that the marginal propensities to consume food out of transfer payment income and other subsidy income are higher than the MPC from wage income. Holbrook and Stafford (1971) demonstrate that the MPC varies across different types of permanent income. They found that the MPC out of labor income was 0.9, the MPC out of capital income was 0.7, and the MPC out of transfer income was 0.3. A recent example involves estimates of the wealth effect on consumption spending. Case, Quigley, and Shiller (2005) compare the effects of changes in housing wealth and financial wealth on household consumption and show that changes in the former tend to have a larger impact than the latter. Finally, consistent with Shefrin and Thaler's (1988) reasoning, Baker, Nagel, and Wurgler (2006) find that the propensity to withdraw and spend dividends on consumption is much higher than for capital gains.

The preceding explanations and evidence provide justification for our analysis. We make no attempt to discriminate between the two explanations; our county-level data precludes this possibility. Our goal is see what insights disaggregating income into its sources provides.

III. Data and Empirical Methodology

We obtained county-level instant lottery game and online lottery game sales data for 2005 from five states — West Virginia, Florida, Iowa, California, and New York.[7] Our sample of states is based on lottery data availability, the desire to compare the empirical results across an adequate number of states representing different parts of the country, and each state having enough counties to ensure a sufficient number (at least 50) of cross-sectional observations for our statistical analysis. Descriptive statistics on lottery sales for five states are shown in Table 1. Average per capita county level total sales range from $66 in Iowa to $280 in New York. For each state in our sample, instant sales

[7] We would prefer to have lottery ticket expenditure and income data at the individual level. To our knowledge, however, no individual-level data exist that document a lottery player's ticket expenditure and the sources of that player's income. Kearney (2005) uses individual level data from the Consumer Expenditure Survey (CES) to explore the effect of lottery ticket purchases on other consumption goods. However, even the relatively comprehensive CES data does not consider lottery ticket purchases (or any other form of gambling) as a separate expenditure category. Thus, we use county-level lottery sales and income data (rather than zip code or census tract level) because county-level data is the most disaggregated unit of observation for which all data in our analysis are available.

exceed online sales, with instant sales as a share of total sales ranging from 55 percent in California to 65 percent in Florida and Iowa.

[Table 1]

County-level income data for the five states for 2005 were obtained from the Bureau of Economic Analysis (BEA), Local Area Personal Income. As in previous studies, the aggregate measure of income used in our analysis is per capita personal income. The individual income sources we consider are: 1) net earnings by place of residence (which we term earnings income); 2) dividends, interest, and rent (which we term wealth income); and 3) personal current transfer receipts (which we term transfer income).[8] Personal current transfer receipts are available by sub-component, such as unemployment insurance, Medicare benefits, and social security benefits. Some transfer payments, such as Medicare benefits, which account for roughly 45 percent of all transfer payments in the United States, and transfer payments to non-profit organizations, are not actually income to the individual that can then be spent on lottery tickets. Thus, our measure of transfer payments considers only those transfers representing direct payments to individuals, and is the sum of OASDI (social security retirement benefits), supplemental security income (SSI), family assistance, other income support benefits, unemployment compensation, and Veterans pension and disability benefits.[9]

Descriptive statistics for total personal income and the three income components are shown in Table 2. As seen in Table 2, earnings income is the largest component of all income in each state, averaging about 62 percent of total income. Not surprising,

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[8] See Table CA05 – Personal Income and Detailed Earnings by Industry at www.bea.gov/regional/reis/. The three income components are found in lines 45, 46, and 47.
[9] See Table CA35 – Personal Current Transfer Detail at www.bea.gov/regional/reis/. The transfer payment variable is the sum of lines 40, 130, 140, 160, 170, and 240.

earnings income per capita is the highest in California ($21,673) and the lowest in West Virginia ($14,231). Wealth income is the next largest share of all income (five-state average is 16.5 percent) in each state except West Virginia, where transfer payment income (five-state average is 10.6 percent) is 14.1 percent of all income and wealth income is only 11.8 percent of all income.

[Table 2]

The availability of detailed transfer payment income from the BEA allows us to break down our transfer payment variable into two additional variables — retirement income and maintenance income. Retirement income is the sum of OASDI (social security retirement benefits) and Veterans pension and disability benefits.[10] Maintenance income is the sum of unemployment insurance and income support benefits.[11] As seen in Table 3, retirement income accounts for roughly 80 percent of transfer payment income across the five states, with a low of 71 percent in California and a high of over 86 percent in Iowa.

[Table 3]

Two related reasons exist for disaggregating transfer payments. First, from the perspective of an individual (or a household), one can view retirement income as permanent income and maintenance income can be viewed as temporary income. Second, in the context of a behavioral life-cycle model, the mental accounting with respect to these sources of transfer payments is likely to lead to separate accounts. One might think that the maintenance income would be used for necessities, while the

[10] See Table CA35 – Personal Current Transfer Detail at www.bea.gov/regional/reis/. The retirement income variable is the sum of lines 40 and 240.
[11] See Table CA35 – Personal Current Transfer Detail at www.bea.gov/regional/reis/. The income maintenance variable is the sum of lines 130, 140, 160 and 170.

retirement income would allow for some discretionary spending, some of which might be used for lottery purchases.

We estimate nine regressions for each of our five lottery states.[12] First, we regress per capita lottery sales (instant sales, online sales, and total sales separately) on our aggregate measure of per capita personal income. We then regress lottery sales (again, instant sales, online sales, and total sales separately) on our three income components (earnings, wealth, and transfers), as well as on earnings, wealth, and the two transfer payment components (retirement income and maintenance income). The coefficient estimate on each income variable reflects the marginal spending on lottery tickets out of the respective income source. We can thus examine and conduct statistical tests for any differences in the marginal spending out of total income versus the components of income, as well as any differences across the income components.

Following the literature on the demand for lottery tickets, we include several economic and demographic control variables in each of our regression models. These demographic variables do not capture any differences in marginal spending by different groups of people, they simply capture whether the size of each demographic group is a significant determinant of lottery ticket expenditures. It is the coefficients on the income component variables that will provide insight into any differences in spending by different demographic groups. Nonetheless, it is important to control for the size of various demographics to ensure that the income variables are only reflecting changes in

[12] We explored pooling the states rather than running separate regressions for each of the five states. Pooling the states imposes the restriction that some (or all) of the coefficients are the same across the states. Statistical tests of coefficient equality across the states for income categories revealed statistically significant (at 1 percent) differences in the income coefficients. This finding is not too surprising, given that the relationship between (aggregate) income and lottery sales in previous studies of lottery demand is quite different depending upon the sample, sample period, and the degree of data aggregation. Our pooled regression results and the equality tests will gladly be provided upon request.

income and not the demographic and economic (other than income) makeup of the county population.

The demographic and economic variables we include are: 1) the percent of the county population that is white, 2) the percent of the county population age 25 or older that has a high school diploma, 3) the percent of the county population that is age 65 or older, 4) the county unemployment rate, and 5) a border dummy variable that takes the value of '1' if a county borders another state, '0' otherwise, to capture the effects of cross-border lottery shopping (Garrett and Marsh, 2002; Tosun and Skidmore, 2004).[13]

IV. Empirical Results

The presentation of empirical results stresses the connection between income and lottery ticket spending. We report the complete regression results in Tables A1 through A5 located in the Appendix. Our discussion begins by presenting the estimates of the marginal spending on lottery tickets out of overall income and out of the three components of income (earnings income, wealth income, and transfer income). We then examine the results of equality tests that examine whether marginal spending on lottery tickets varies across the three components of income. Finally, we present the estimates of the marginal spending on lottery tickets out of the two transfer income components (maintenance income and retirement income) as well as equality tests between these two transfer income components and earnings income and wealth income.

[13] The unemployment rate was obtained from the Bureau of Labor Statistics. The percent of the county population that is white was obtained from the U.S Census, *Intercensal County Population Estimates by Age, Sex, and Race* (2000-2005). The percent of the county population age 25 or older with a high school diploma was obtained from the U.S. Census, 2000 Decennial Census. The percent of the county population age 65 or older was obtained from the U.S. Census, *County Population Estimates – Characteristics*. We also considered the percent of the county population below the poverty level as an explanatory variable. This variable, however, was highly correlated with the percent of the county population with a high school diploma and the percent of the county population that is white.

Our estimates of the marginal spending on lottery tickets out of income and the three components of income are shown in Table 4. The estimates listed in Table 4 are per \$100 of income (the coefficient on income from the respective Appendix table multiplied by 100). Thus, the value of 0.27 for total sales in West Virginia means that for a \$100 increase in per capita income, total spending on lottery tickets increases 27 cents. In our discussion we will use "statistical significance" to refer to statistical significance at 10 percent or better. We discuss the results by state, then by income, and finally by income components.

[Table 4]

The results for West Virginia provide little evidence that the marginal spending on lottery tickets out of the three income components is statistically significant. In fact, in each case the overall adjusted explanatory power declines as the individual income components replace all income (see Appendix Table A1). For instant sales neither all income nor any of the individual income components are statistically significant. The results for online and total lottery purchases are much stronger with all income being statistically significant in both cases. Nonetheless, disaggregating income into the three income components yields little, with wealth income in the online sales regression being the only individual income component that is statistically significant.

Turning to the results for Florida, the overall adjusted explanatory power increases as the individual income components replace all income. All income is not statistically significant in the regressions for instant sales, online sales, and total sales, while earnings income is statistically significant for instant sales and transfer income is statistically significant for both online sales and total sales. One might also note that the marginal spending on lottery tickets from transfer income is substantially larger than from the other two income sources. Looking at total sales, the marginal spending on lottery tickets from transfer income is over $5 per $100 in transfer income while the estimates of marginal spending on tickets from earnings income and wealth income are much less (and not statistically different than zero in most cases).

The results for Iowa are similar to those for Florida. In each case the overall adjusted explanatory power increases as the individual income components replace all income. The marginal spending on tickets out of total income ranges from 12 cents to 26 cents per $100 in income depending upon game type. The marginal spending on tickets out of earnings income is statistically significant for online sales (9 cents per $100) and total sales (19 cents per $100). The marginal spending on tickets out of transfer income is statistically significant for all game types and, as with Florida, the results for Iowa reveal that the marginal spending on lottery tickets out of transfer income is larger ($1.63 to $5.04 per $100) than the marginal spending on tickets out of earnings income and transfer income.

The results for California are similar to the results for West Virginia. In each case the overall adjusted explanatory power declines as the individual income components replace all income. All income is only statistically significant in the regression for instant sales. Moreover, it has a negative impact on instant sales. Only two individual income components are statistically significant — wealth income in the instant sales regression and transfer income in the online sales regression — and both have a negative impact on sales.

The results for New York are similar to those of Iowa and Florida. In each case the overall adjusted explanatory power increases, albeit slightly, as the individual income components replace all income. The marginal spending on tickets out of transfer income is statistically significant and has a value of $5.16 per $100 in transfer income, while the marginal spending on instant tickets out of total income is not statistically different than zero. For total sales and online sales, the marginal spending on tickets out of total income are statistically significant and have similar magnitudes (29 cents and 23 cents per $100, respectively) to the estimates for Iowa and West Virginia. As in Florida and Iowa, the marginal spending on tickets out of transfer income is much larger than those from other income sources. In New York, the marginal spending on tickets ranges from $5.16 per $100 for instant games to $10.64 per $100 for all lottery games.

At this point, it is worth summarizing the results presented in Table 4. The marginal spending on tickets out of total income is statistically significant in 8 of the 15 regressions and ranges from -7.2 cents per $100 to 29 cents per $100. Of the three components of income, there is clear evidence that the marginal spending on tickets out of transfer income is larger (ranging from $1.58 per $100 to $10.64 per $100) and more often significant than the marginal spending on tickets out of earnings income or wealth income. The marginal spending on tickets out of earnings income and wealth income are statistically significant in four and two, respectively, of the 15 regressions, while the marginal spending on tickets out of transfer income is statistically significant in nine of the 15 regressions.

An important question is whether the estimates of marginal spending shown in Table 4 are statistically different. Table 5 contains the results of equality tests (*F*-tests) for the marginal spending on tickets out of each income component. A consistent finding across the five states and the regressions for each dependent variable is that the marginal spending on lottery tickets does not differ between earnings income and wealth income. Differences are found, however, when the results for transfer income are examined. For Florida, Iowa, and New York, the marginal spending on lottery tickets differs between transfer and earnings income as well as between transfer income and wealth income.

[Table 5]

Given the importance of transfer income in explaining lottery tickets purchases and the availability of data on the components of transfer income, we present the estimates of marginal spending on tickets out of retirement income and maintenance income. These estimates (along with estimates of marginal spending out of all income, earnings income, and wealth income) are shown in Table 6. Table 7 contains the results of pairwise equality tests between the marginal spending coefficients shown in Table 6.

[Table 6]

[Table 7]

As seen in Table 6, the marginal spending on tickets out of retirement income is statistically significant in eight of 15 cases (and negative in 2 cases) and the marginal spending on tickets out of maintenance income is statistically significant in six of 15 cases (and negative in 1 case). The insights generated by disaggregating transfer income are highlighted by the results for Iowa and New York. For Iowa, recall that transfer income was statistically significant for all three dependent variables. The results in Table 6 indicate that those results are driven by maintenance income. Maintenance income is statistically significant for all three dependent variables, while retirement income is not statistically significant. On the other hand, the results concerning transfer income for New York can be attributed to retirement income. Retirement income is statistically significant for all three dependent variables, while maintenance income is not significant.

The replacement of transfer income with retirement and maintenance income, not surprisingly, affects the overall explanatory power of some models. Generally speaking, the effects for West Virginia and New York are minimal, while the effects for Florida, Iowa, and California are noteworthy (see Appendix Tables A1-A5). For example, disaggregating transfer income into retirement and maintenance income is associated with an increase of the adjusted R^2 for all lottery games from 0.29 to 0.36 in Florida, 0.14 to 0.19 in Iowa, and 0.07 to 0.11 in California.

Turning to the tests for the equality of the marginal spending on lottery tickets in Table 7, there is evidence that these differ across income source. Comparing the estimates of marginal spending for retirement income with maintenance income, one finds a statistically significant difference in nine of 15 cases. Every state has at least one case of a statistically significant difference, with Iowa showing a difference in all three categories of sales. Comparisons of retirement income with earnings and wealth income and comparisons of maintenance income with earnings and wealth income yield similar results. For each of the four pairwise comparisons, seven of 15 cases reveal differences in the marginal spending on lottery tickets.

V. Discussion and Concluding Comments

Our analysis was motivated by numerous theoretical and empirical studies whose results suggested that marginal spending on individual goods and services as well as in the aggregate might differ across income sources. The existing studies provided two explanations as to why marginal spending on lotteries might differ across income sources. One explanation highlights the fact that different demographic groups have both different income sources and spending patterns. A second explanation stresses that the different sources of income might not be spent the same on the margin by an individual. Our study explored the marginal spending on lottery tickets out of various sources of income, namely earnings income, wealth income, and transfer payment income.

The results of the empirical analysis provide evidence that all income is not the same in the case of lottery ticket purchases. Specifically, for the five lottery states used in the analysis, we found that in the majority of cases the marginal spending on lottery tickets out of transfer income is larger (and more often statistically significant) than the marginal spending on tickets out of earnings income and wealth income. In addition, the marginal spending on lottery tickets out of two components of transfer income – maintenance income and retirement income – significantly explain lottery sales and are significantly different in the majority of regressions.

The marginal spending on lottery tickets out of transfer payments was larger than we expected for many states. Our surprise reinforces the value of our study. The result that the marginal spending on lottery tickets out of transfer income is larger than for other income sources is a likely result of the demographic makeup of lottery players. Past studies on the demand for lottery tickets cited in the introduction of this paper have showed that lower income individuals and older individuals are most likely to play the lottery compared to other demographic groups.

Furthermore, our empirical models not only considered different sources of income, but also the demographic makeup of the county population. So, unlike earlier studies, we are more directly comparing the influence of particular types of income on lottery ticket purchases holding the respective demographic characteristic constant. This is an interesting exercise, given that the size of a certain demographic in a county, say, the percentage of the county population over age 65, does not capture the income of this demographic as well as a measure of this demographic's source of income, such as transfer payments and, more specifically, retirement income. Our models thus not only capture the size of a particular demographic, but also more precisely account for the income of this demographic.

Our results have several implications for state lottery research and public policy toward state lotteries. The results suggest that using an aggregate measure of income such as personal income in models of lottery demand may mask interesting differences in the marginal spending on lottery tickets. In addition, disaggregating total income into various components in an empirical model of lottery sales allows one to better discern the different effects of a certain demographic group's income and the size of the demographic group.

Forecasting state lottery revenues could be improved by incorporating components of income rather than total income in lottery forecasting models. Not only would this likely provide clearer evidence on those income components that drive lottery sales, it would also allow one to better examine the influence of more specific public policy changes, such as a policy toward changing transfer payments, on lottery sales.

Disaggregating income would thus allow any forecasting model to more precisely capture the effects of policy changes on state lottery sales.

The results also have implications for the efficiency of state lottery finance and lottery earmarks to specific programs. A deadweight loss commonly results from tax and spend policies, such as transfer payments (Browning, 1976). Our finding that the marginal spending on lottery tickets out of transfer income is the largest and most significant of the income sources suggests a greater deadweight loss than if earnings income or wealth income were predominately spent on lottery tickets. This is a result of the numerous tax and spend channels a dollar must pass before it is finally spent on the earmarked program: Individuals first receive a transfer payment that includes some deadweight loss; a portion of these transfer payments are then spent on lottery tickets that have a very high effective tax and a deadweight loss (Clotfelter and Cook, 1987; Rodgers and Stuart, 1995); net lottery revenues are then spent on the targeted program, such as education. The total cost of financing social programs with state lotteries is worthy of additional study.

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Table 1: State Lottery Sales

	Sample Averages ($ per capita)		
State	Instant Lottery Sales	Online Lottery Sales	Total Lottery Sales
West Virginia	61.79	38.84	100.61
Florida	141.86	77.47	219.33
Iowa	43.22	22.87	66.09
California	48.01	39.68	87.69
New York	175.52	104.41	279.93

Note: Average of per capita county level sales. Number of counties in each state: West Virginia (55), Florida (67), Iowa (99), California (58), New York (62). Data are for 2005. Lottery sales information provided by each state lottery agency.

Table 2: Descriptive Statistics – Income Components and Shares

State	Sample Averages						
	All Income	Earnings Income	Wealth Income	Transfer Income	Earnings % of All	Wealth % of All	Transfer % of All
West Virginia	$23,892	$14,231	$2,863	$3,261	59.0	11.8	14.1
Florida	28,110	16,089	6,383	2,865	57.9	20.4	11.0
Iowa	28,915	18,499	5,226	2,707	63.7	18.1	9.5
California	32,937	21,673	6,020	2,543	64.7	17.7	8.6
New York	31,224	20,483	4,659	2,826	64.6	14.7	9.7
State Average	29,016	18,195	5,030	2,840	62.0	16.5	10.6

Note: All Income is per capita personal income. Earnings Income is per capita net earnings by place of residence. Transfer Income per capita is the sum of income maintenance benefits (less food stamps), unemployment compensation, veterans pension and disability benefits, and OASDI benefits. All data are from the Bureau of Economic Analysis, Local Area Personal Income (Tables CA05 and Tables CA35) and are available at http://www.bea.gov/regional/reis/ Income components do not sum to income in the first column. See text for details. Number of counties in each state: West Virginia (55), Florida (67), Iowa (99), California (58), New York (62). Data are for 2005.

Table 3: Descriptive Statistics – Transfer Income Components and Shares

	Sample Averages				
State	Transfer Income	Retirement Income	Maintenance Income	Retirement % of Transfer	Maintenance % of Transfer
West Virginia	$3,261	$2,658	$603	81.5	18.5
Florida	2,865	2,401	463	82.6	17.4
Iowa	2,707	2,341	366	86.4	13.6
California	2,543	1,822	721	70.9	29.1
New York	2,826	2,199	627	77.6	22.4
State Average	2,840	2,284	556	79.8	20.2

Note: Transfer Income per capita is the sum of income maintenance benefits (less food stamps), unemployment compensation, veterans pension and disability benefits, and OASDI benefits. Retirement Income is veterans' pension and disability benefits plus OASDI benefits. Maintenance Income is unemployment compensation plus income maintenance benefits. All data are from the Bureau of Economic Analysis, Local Area Personal Income (Tables CA35) and are available at http://www.bea.gov/regional/reis/. Number of counties in each state: West Virginia (55), Florida (67), Iowa (99), California (58), New York (62). Data are for 2005.

Table 4 – Marginal Spending on Lottery Tickets: By Income Source (Per $100 in Income)

West Virginia

	All Income	Earnings Income	Wealth Income	Transfer Income
Instant Sales	-0.002	-0.13	0.21	0.05
Online Sales	0.27**	0.18	0.67**	0.28
Total Sales	0.27**	0.05	0.87	0.33

Florida

	All Income	Earnings Income	Wealth Income	Transfer Income
Instant Sales	-0.09	-0.27**	0.05	3.83
Online Sales	0.07	0.09	0.04	1.58**
Total Sales	-0.02	-0.18	0.08	5.41*

Iowa

	All Income	Earnings Income	Wealth Income	Transfer Income
Instant Sales	0.15**	0.10	0.03	3.40**
Online Sales	0.12**	0.09**	0.09	1.63**
Total Sales	0.26**	0.19*	0.12	5.04**

California

	All Income	Earnings Income	Wealth Income	Transfer Income
Instant Sales	-0.072**	-0.02	-0.18*	0.72
Online Sales	0.19	-0.01	0.55	-1.97*
Total Sales	0.12	-0.03	0.38	-1.24

New York

	All Income	Earnings Income	Wealth Income	Transfer Income
Instant Sales	0.05	0.05	0.09	5.16*
Online Sales	0.23**	0.27**	0.06	5.50**
Total Sales	0.29**	0.32	0.15	10.64**

Note: 'All Income' is from coefficients in Column (1), (4), and (7) of Tables A1 though A5, multiplied by 100 and rounded. Other incomes are from coefficients in Column (2), (5), and (8) of Tables A1 though A5, multiplied by 100 and rounded. * denotes significance at 10 percent, ** at 5 percent or better.

Table 5: Equality Tests for Marginal Spending by Income Source
F-tests on Coefficient Equality

	H_o: Transfer = Earnings	H_o: Transfer = Wealth	H_o: Earnings = Wealth
West Virginia			
Instant Sales	0.10	0.04	0.28
Online Sales	0.04	0.41	0.89
Total Sales	0.14	0.30	0.97
Florida			
Instant Sales	10.05**	8.65**	1.97
Online Sales	2.84*	3.08**	0.13
Total Sales	9.22**	8.46**	0.67
Iowa			
Instant Sales	7.68**	7.50**	0.08
Online Sales	10.05**	9.34**	0.00
Total Sales	9.63**	9.26**	0.04
California			
Instant Sales	0.77	1.02	0.72
Online Sales	0.94	1.42	1.65
Total Sales	0.34	0.55	0.79
New York			
Instant Sales	3.18*	3.16*	0.01
Online Sales	7.24**	7.96**	0.20
Total Sales	6.20**	6.49**	0.03

Notes: * denotes significance at 10 percent, ** at 5 percent or better. F-tests are for coefficients shown in Table 4.

Table 6 – Marginal Spending on Lottery Tickets: By Income Source and Transfer Income Source (Per $100 in Income)

West Virginia

	All Income	Earnings Income	Wealth Income	Retirement Income	Maintenance Income
Instant Sales	-0.002	-0.15	0.18	0.21	-0.82
Online Sales	0.27**	0.08	0.55	1.16*	-4.68*
Total Sales	0.27**	-0.68	0.74	1.37	-5.50

Florida

	All Income	Earnings Income	Wealth Income	Retirement Income	Maintenance Income
Instant Sales	-0.09	-0.19	0.02	3.15	14.83**
Online Sales	0.07	0.12*	0.03	1.29**	6.24
Total Sales	-0.02	-0.06	0.05	4.43*	21.07**

Iowa

	All Income	Earnings Income	Wealth Income	Retirement Income	Maintenance Income
Instant Sales	0.15**	0.18*	0.08	1.27	10.56**
Online Sales	0.12**	0.13**	0.12**	0.51	5.37**
Total Sales	0.26**	0.31**	0.20	1.78	15.93**

California

	All Income	Earnings Income	Wealth Income	Retirement Income	Maintenance Income
Instant Sales	-0.072**	-0.02	-0.18*	0.48	0.95
Online Sales	0.19	0.10	0.51	-7.54**	3.63
Total Sales	0.12	0.08	0.33	-7.05**	4.59

New York

	All Income	Earnings Income	Wealth Income	Retirement Income	Maintenance Income
Instant Sales	0.05	0.06	0.001	5.78*	2.91
Online Sales	0.23**	0.31**	-0.17	7.02**	-0.05
Total Sales	0.29**	0.37*	-0.17	12.79**	2.86

Note: 'All Income' is from Column (1), (4), and (7) of Tables A1 though A5, multiplied by 100 and rounded. Other incomes are from Column (3), (6), and (9) of Tables A1 though A5, multiplied by 100 and rounded. * denotes significance at 10 percent, ** at 5 percent or better.

Table 7: Equality Tests for Marginal Spending by Income Source
F-tests on Coefficient Equality

West Virginia

	H_o: Retirement = Earnings	H_o: Retirement= Wealth	H_o: Retirement = Maintenance	H_o: Maintenance = Earnings	H_o: Maintenance = Wealth
Instant Sales	0.16	0.04	0.06	0.04	0.08
Online Sales	2.23	0.56	3.25*	3.04*	3.62*
Total Sales	1.50	0.22	1.64	1.45	1.88

Florida

	H_o: Retirement = Earnings	H_o: Retirement= Wealth	H_o: Retirement = Maintenance	H_o: Maintenance = Earnings	H_o: Maintenance = Wealth
Instant Sales	6.99**	6.28**	7.11**	12.34**	11.80**
Online Sales	1.70	2.04	2.54	4.08**	4.14**
Total Sales	6.29**	6.11**	7.12**	12.07**	11.74**

Iowa

	H_o: Retirement = Earnings	H_o: Retirement= Wealth	H_o: Retirement = Maintenance	H_o: Maintenance = Earnings	H_o: Maintenance = Wealth
Instant Sales	0.50	0.58	5.08**	9.62**	9.66**
Online Sales	0.38	0.39	8.67**	15.31**	15.14**
Total Sales	0.54	0.61	7.01**	12.96**	12.95**

California

	H_o: Retirement = Earnings	H_o: Retirement= Wealth	H_o: Retirement = Maintenance	H_o: Maintenance = Earnings	H_o: Maintenance = Wealth
Instant Sales	0.12	0.21	0.04	0.47	0.60
Online Sales	5.37**	5.97**	4.56**	1.20	0.88
Total Sales	4.31**	4.62**	4.56**	1.87	1.50

New York

	H_o: Retirement = Earnings	H_o: Retirement= Wealth	H_o: Retirement = Maintenance	H_o: Maintenance = Earnings	H_o: Maintenance = Wealth
Instant Sales	3.30*	3.21*	0.24	0.27	0.30
Online Sales	10.54**	11.54**	3.33*	0.01	0.00
Total Sales	7.62**	7.91**	1.39	0.10	0.16

Notes: * denotes significance at 10 percent, ** at 5 percent or better. F-tests are for coefficients shown in Table 6.

Appendix Table A1: West Virginia Lottery, Complete Regression Results

	Instant Lottery Games			Online Lottery Games			All Lottery Games		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	85.63 (0.67)	132.80 (1.05)	137.83 (1.06)	115.85* (1.71)	179.16** (2.65)	207.93** (3.68)	201.48 (1.22)	311.96* (1.87)	345.76** (2.06)
All Personal Income	-0.00002 (0.02)	-------	-------	0.0027** (3.40)	-------	-------	0.0027** (2.22)	-------	-------
Earnings Income	-------	-0.0013 (0.90)	-0.0015 (0.91)	-------	0.0018 (1.43)	0.00081 (0.74)	-------	0.00049 (0.26)	-0.00069 (0.32)
Transfer Income	-------	0.00052 (0.09)	-------	-------	0.0028 (0.85)	-------	-------	0.0033 (0.44)	-------
Wealth Income	-------	0.0021 (0.39)	0.0019 (0.34)	-------	0.0067** (2.64)	0.0055** (2.12)	-------	0.0087 (1.24)	0.0074 (1.04)
Retirement Income	-------	-------	0.0021 (0.24)	-------	-------	0.012* (1.94)	-------	-------	0.014 (1.25)
Maintenance Income	-------	-------	-0.0082 (0.82)	-------	-------	-0.047* (1.82)	-------	-------	-0.055 (1.20)
Unemployment Rate	-4.31 (1.55)	-5.69* (1.88)	-5.64* (1.83)	2.95 (1.25)	3.12 (1.15)	3.39 (1.29)	-1.36 (0.38)	-2.57 (0.64)	-2.26 (0.57)
Percent High School	47.06 (0.57)	71.83 (0.76)	64.03 (0.64)	54.92 (0.88)	75.54 (1.33)	30.85 (0.54)	101.98 (0.95)	147.38 (1.18)	94.88 (0.73)
Percent White	-68.32 (0.49)	-96.53 (0.69)	-92.51 (0.65)	-221.75** (2.75)	-274.91** (3.40)	-251.89** (3.35)	-290.07 (1.63)	-371.44** (2.02)	-344.40* (1.87)
Percent 65 or older	339.43** (2.12)	261.38 (1.18)	252.09 (1.11)	194.00* (1.95)	135.44 (0.79)	82.25 (0.54)	533.43** (2.59)	396.83 (1.36)	334.34 (1.14)
Border Dummy	-11.56* (1.89)	-10.23 (1.62)	-10.90 (1.58)	7.29** (2.01)	6.20* (1.72)	2.43 (0.72)	-4.27 (0.54)	-4.04 (0.49)	-8.47 (0.95)
Adjusted R^2	0.061	0.039	0.019	0.393	0.370	0.340	0.234	0.178	0.189

Notes: absolute *t*-statistics in parentheses. * denotes significance at 10 percent, ** at 5 percent or better. Sample is West Virginia counties. Number of observations = 55. See text for variable description.

Appendix Table A2: Florida Lottery, Complete Regression Results

	Instant Lottery Games			Online Lottery Games			All Lottery Games		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	130.19* (1.70)	164.30** (2.38)	66.77 (0.87)	79.13 (1.49)	72.02 (1.33)	30.66 (0.46)	209.32* (1.90)	236.32** (2.19)	97.42 (0.78)
All Personal Income	-0.00092 (1.13)	-------	-------	0.00074 (1.47)	-------	-------	-0.00018 (0.17)	-------	-------
Earnings Income	-------	-0.0027** (2.08)	-0.0019 (1.51)	-------	0.00089 (1.29)	0.0012* (1.75)	-------	-0.0018 (1.03)	-0.00064 (0.39)
Transfer Income	-------	0.038 (1.61)	-------	-------	0.016** (2.13)	-------	-------	0.054* (1.80)	-------
Wealth Income	-------	0.00046 (0.48)	0.00022 (0.22)	-------	0.00036 (0.37)	0.00025 (0.30)	-------	0.00081 (0.48)	0.00047 (0.31)
Retirement Income	-------	-------	0.032 (1.57)	-------	-------	0.013** (2.23)	-------	-------	0.044* (1.84)
Maintenance Income	-------	-------	0.15** (2.67)	-------	-------	0.062 (1.61)	-------	-------	0.21** (3.02)
Unemployment Rate	2.51 (0.35)	0.78 (0.16)	-6.92 (1.47)	8.35** (2.23)	8.33** (2.09)	5.06 (1.10)	10.86 (1.48)	9.11 (1.19)	-1.85 (0.23)
Percent High School	127.58 (0.99)	-34.94 (0.31)	-96.80 (0.79)	-80.48 (0.99)	-133.19 (1.55)	-159.42** (2.00)	47.09 (0.29)	-168.13 (1.03)	-256.22* (1.75)
Percent White	-48.39 (0.80)	-20.60 (0.42)	65.16 (0.97)	-71.40 (1.64)	-61.32 (1.38)	-24.95 (0.41)	-119.79 (1.35)	-81.92 (0.98)	40.20 (0.37)
Percent 65 or older	99.02 (0.98)	-438.05 (1.65)	-258.17 (1.00)	160.54** (3.06)	15.97 (0.14)	92.25 (1.01)	259.56** (2.19)	-422.07 (1.21)	-165.92 (0.54)
Border Dummy	44.26** (3.47)	37.50** (2.78)	36.52** (3.05)	19.47* (1.69)	17.45 (1.58)	17.04 (1.66)	63.72** (2.62)	54.95** (2.44)	53.55** (2.69)
Adjusted R^2	0.238	0.339	0.402	0.275	0.279	0.298	0.197	0.289	0.356

Notes: absolute *t*-statistics in parentheses. * denotes significance at 10 percent, ** at 5 percent or better. Sample is Florida counties. Number of observations = 67. See text for variable description.

Appendix Table A3: Iowa Lottery, Complete Regression Results

	Instant Lottery Games			Online Lottery Games			All Lottery Games		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-15.09	-61.90	-139.86	62.25*	41.90	1.09	47.16	-20.00	-138.77
	(0.15)	(0.62)	(1.36)	(1.72)	(1.16)	(0.03)	(0.36)	(0.15)	(1.10)
All Personal Income	0.0015**	-------	-------	0.0012**	-------	-------	0.0026**	-------	-------
	(2.06)			(4.12)			(2.79)		
Earnings Income	-------	0.0010	0.0018*	-------	0.00086**	0.0013**	-------	0.0019*	0.0031**
		(1.02)	(1.77)		(2.37)	(3.17)		(1.68)	(2.51)
Transfer Income	-------	0.034**	-------	-------	0.016**	-------	-------	0.050**	-------
		(2.88)			(2.89)			(2.93)	
Wealth Income	-------	0.00026	0.00084	-------	0.00090	0.0012**	-------	0.0012	0.0020
		(0.12)	(0.40)		(1.43)	(2.12)		(0.63)	(1.24)
Retirement Income	-------	-------	0.013	-------	-------	0.0051	-------	-------	0.018
			(0.84)			(0.79)			(0.88)
Maintenance Income	-------	-------	0.11**	-------	-------	0.054**	-------	-------	0.16**
			(3.13)			(4.92)			(4.67)
Unemployment Rate	6.89**	2.42	-0.87	2.30*	0.26	-1.46	9.20**	2.68	-2.33
	(2.20)	(0.69)	(0.23)	(1.78)	(0.17)	(1.02)	(2.23)	(0.57)	(0.53)
Percent High School	-26.94	-29.00	-35.31	46.29**	46.08**	42.78**	19.35	17.09	7.48
	(0.47)	(0.52)	(0.64)	(2.11)	(2.06)	(2.00)	(0.26)	(0.24)	(0.11)
Percent White	-34.71	25.44	90.89	-109.31**	-81.04**	-46.78	-144.02	-55.59	44.11
	(0.33)	(0.24)	(0.85)	(2.77)	(2.07)	(1.33)	(1.03)	(0.42)	(0.35)
Percent 65 or older	172.92**	-173.13	39.27	25.98	-139.90**	-28.74	198.90**	-313.04	10.53
	(2.39)	(1.14)	(0.22)	(1.10)	(2.12)	(0.39)	(2.09)	(1.59)	(0.05)
Border Dummy	-3.45	-3.30	-4.31	2.45	2.62	2.08	-1.00	-0.68	-2.23
	(0.95)	(0.92)	(1.23)	(1.39)	(1.53)	(1.24)	(0.21)	(0.14)	(0.46)
Adjusted R^2	0.068	0.111	0.149	0.192	0.237	0.297	0.083	0.136	0.190

Notes: absolute *t*-statistics in parentheses. * denotes significance at 10 percent, ** at 5 percent or better. Sample is Iowa counties. Number of observations = 99. See text for variable description.

Appendix Table A4: California Lottery, Complete Regression Results

	Instant Lottery Games			Online Lottery Games			All Lottery Games		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	137.96**	111.69**	108.78**	-54.97	37.94	-126.18	82.98	153.63**	-17.41
	(5.11)	(4.58)	(2.47)	(0.56)	(0.83)	(1.06)	(0.87)	(2.86)	(0.14)
All Personal Income	-0.00072**	-------	-------	0.0019	-------	-------	0.0012	-------	-------
	(2.30)			(1.39)			(0.92)		
Earnings Income	-------	-0.00021	-0.00016	-------	-0.00011	0.00099	-------	-0.00032	0.00083
		(0.56)	(0.36)		(0.18)	(1.18)		(0.45)	(0.84)
Transfer Income	-------	0.0072	-------	-------	-0.020*	-------	-------	-0.012	-------
		(0.87)			(1.84)			(0.80)	
Wealth Income	-------	-0.0018*	-0.0018*	-------	0.0055	0.0051	-------	0.0038	0.0033
		(1.83)	(1.86)		(1.10)	(1.13)		(0.81)	(0.80)
Retirement Income	-------	-------	0.0048	-------	-------	-0.075**	-------	-------	-0.071**
			(0.37)			(2.41)			(2.13)
Maintenance Income	-------	-------	0.0095	-------	-------	0.036	-------	-------	0.046
			(0.77)			(0.98)			(1.25)
Unemployment Rate	0.20	-0.13	-0.31	1.87	2.48	-1.66	2.07	2.35	-1.96
	(0.18)	(0.12)	(0.26)	(0.78)	(1.11)	(1.14)	(0.89)	(0.98)	(0.94)
Percent High School	-76.35	-87.85	-78.62	360.96	349.37	568.46	284.61	261.52	489.84
	(0.89)	(1.04)	(0.75)	(1.22)	(1.31)	(1.60)	(1.03)	(1.01)	(1.50)
Percent White	-47.60**	-33.84*	-29.70	-79.83**	-129.23*	-30.86	-127.44**	-163.07**	-60.55
	(3.49)	(2.00)	(1.35)	(2.40)	(2.00)	(0.84)	(3.60)	(2.75)	(1.25)
Percent 65 or older	-32.18	-120.26	-88.22	-46.31	177.52	938.51**	-78.49	57.27	850.29*
	(0.34)	(0.81)	(0.45)	(0.25)	(0.53)	(2.63)	(0.39)	(0.15)	(1.86)
Border Dummy	-16.76**	-16.84**	-17.05**	20.64*	21.67	16.64	3.88	4.83	-0.41
	(3.67)	(3.51)	(3.63)	(1.78)	(1.66)	(1.60)	(0.33)	(0.37)	(0.04)
Adjusted R^2	0.390	0.382	0.370	0.158	0.145	0.203	0.074	0.044	0.109

Notes: absolute *t*-statistics in parentheses. * denotes significance at 10 percent, ** at 5 percent or better. Sample is California counties. Number of observations = 58. See text for variable description.

Appendix Table A5: New York Lottery, Complete Regression Results

	Instant Lottery Games			Online Lottery Games			All Lottery Games		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	61.74	73.32	89.63	225.48**	241.67**	281.89**	287.22**	314.99**	371.53**
	(0.90)	(1.07)	(1.17)	(4.70)	(5.22)	(5.60)	(2.81)	(3.18)	(3.39)
All Personal Income	0.00053	-------	-------	0.0023**	-------	-------	0.0029**	-------	-------
	(1.01)			(6.43)			(3.70)		
Earnings Income	-------	0.00046	0.00062	-------	0.0027**	0.0031**	-------	0.0032	0.0038*
		(0.34)	(0.45)		(3.04)	(3.46)		(1.66)	(1.90)
Transfer Income	-------	0.052*	-------	-------	0.055**	-------	-------	0.11**	-------
		(1.81)			(2.85)			(2.58)	
Wealth Income	-------	0.00094	0.000014	-------	0.00059	-0.0017	-------	0.0015	-0.0017
		(0.16)	(0.00)		(0.15)	(0.42)		(0.18)	(0.19)
Retirement Income	-------	-------	0.058*	-------	-------	0.070**	-------	-------	0.13**
			(1.84)			(3.40)			(2.85)
Maintenance Income	-------	-------	0.029	-------	-------	-0.00050	-------	-------	0.029
			(0.54)			(0.01)			(0.37)
Unemployment Rate	4.25	-2.73	0.013	-3.45	-10.48*	-3.71	0.80	-13.22	-3.70
	(0.56)	(0.32)	(0.00)	(0.65)	(1.81)	(0.55)	(0.07)	(1.07)	(0.25)
Percent High School	-98.44	-32.68	-42.98	149.30	197.23*	171.84	50.86	164.54	128.86
	(0.64)	(0.20)	(0.25)	(1.39)	(1.75)	(1.55)	(0.22)	(0.68)	(0.53)
Percent White	19.26	-21.36	-49.70	-299.67**	-349.32**	-419.19**	-280.41**	-370.68**	-468.90**
	(0.31)	(0.32)	(0.56)	(6.84)	(7.80)	(7.20)	(3.01)	(3.87)	(3.70)
Percent 65 or older	630.99**	-120.22	-119.50	275.72*	-391.75	-389.96	906.71**	-511.97	-509.45
	(2.80)	(0.22)	(0.22)	(1.76)	(1.07)	(1.09)	(2.71)	(0.65)	(0.65)
Border Dummy	9.42	8.55	9.26	12.35**	11.31*	13.07**	21.77*	19.85	22.33*
	(1.10)	(1.00)	(1.06)	(2.08)	(1.95)	(2.27)	(1.72)	(1.60)	(1.78)
Adjusted R^2	0.087	0.107	0.094	0.783	0.800	0.809	0.500	0.535	0.538

Notes: absolute *t*-statistics in parentheses. * denotes significance at 10 percent, ** at 5 percent or better. Sample is New York counties. Number of observations = 62. See text for variable description.