Risk Taking Begets Risk Taking: Evidence from Casino Openings and Investor Portfolios

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Abstract

In this study, we show that individuals' non-investment risk-taking behavior can affect their willingness to take financial risks. Risk taking itself is an activity that induces strong emotional responses; we posit that the very act of taking risks may induce excitement, which Kuhnen and Knutson (2011) previously show can induce greater financial risk taking. To test this hypothesis, we identify a very specific setting where a subset of investors is more likely to be exposed to increased risk taking through gambling. Using the initial legalization and opening of commercial casinos in the U.S. as a natural experiment, we show that the opening of a casino in close geographical proximity to investors results in increased risk taking in the portfolios of those investors who are likely to visit the casino to gamble relative to those investors who are not. These likely gamblers, who are exposed to increased risk taking, subsequently realize higher returns, but do not improve the overall mean-variance efficiency of their portfolios. These findings provide insight into the nature of risk taking and the amplifying effect that taking risks in one context may have on financial risk taking.

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1 Introduction

The nature of risk taking is fundamental to decision making in the realm of economic choices and beyond. Our understanding of risk and risk taking has bearing on every aspect of portfolio design, from asset allocation to asset selection to performance evaluation. Standard models in economics and finance assume that individuals are endowed with stable, well-defined risk preferences. More recently, however, studies have shown that risk preferences do not necessarily behave as previously assumed and can, in fact, vary throughout an individual's lifetime as a result of economic experiences (Malmendier and Nagel, 2011), environmental factors that influence mood (Saunders, 1993; Hirshleifer and Shumway, 2003; Kamstra et al., 2003), and emotions such as fear (Guiso et al., 2013), anxiety, and excitement (Kuhnen and Knutson, 2011). In a similar manner, we identify a specific factor that has the potential to alter individuals' willingness to take financial risk; in this case, however, the factor affecting risk taking is risk taking itself.

More specifically, we empirically test whether increased risk taking in one context can influence risk taking in financial investments. That is, we study *changes* in financial risk taking as a *direct result* of increased risk-taking behavior outside of investment decisions. Risk taking itself is an activity that induces strong emotional responses, even in professional traders (Lo and Repin, 2002). Thus, it is plausible that the very act of taking risks may alter emotional states and consequently elicit changes in subsequent financial risk taking. We build on the literature linking emotional responses to variations in risk taking and posit that emotion may be a plausible channel through which risk taking in one context perpetuates risk taking in financial investments.

Risk taking and the anticipation of monetary gains have been linked with feelings of positive arousal (Breiter et al., 2001; Knutson et al., 2001). Furthermore, the neurofinance literature has shown that positive emotional states such as excitement induce people to take larger risks and become more confident in their ability to evaluate investment options (Kuhnen and Knutson, 2011). Recent experimental studies find that changes in emotional states have the ability to alter both the beliefs and preferences of subjects' risk-taking behavior (Knutson et al., 2008; Kuhnen and Knutson, 2011). While the role of emotions on risk taking has been well documented in an experimental setting, we provide evidence that perhaps the excitement induced by risk taking can increase the level of subsequent risks taken outside the laboratory when individuals presumably make more deliberate financial decisions.

To test the above hypothesis, we use a very specific setting in which investors are granted access to an establishment that encourages risk taking. We identify casino-type gambling as a specific instance of risk taking and use the initial legalization and opening of casinos in the United States as a natural experiment to test whether exposure to increased risk taking through gambling, elicits increases in financial risk taking. Gambling may be viewed as an extreme form of risk taking, but we posit that it is nonetheless a form of risk taking that generates excitement in those who participate and thus a reasonable surrogate for increased risk taking.[1] Furthermore, casino openings are relatively exogenous events and provide a useful natural experiment to test whether externalities that facilitate increased risk taking in one setting translate to subsequent increases in financial risk taking.

Up until the late 1980s, all forms of commercial gaming, except for bingo and horse racing, were illegal everywhere in the U.S. except for Nevada and Atlantic City, New Jersey. The legal climate for American casinos began to shift in the 1970s. Between 1978 and 1988, a number of states made serious efforts to legalize casinos, however, it wasn't until 1989 when things began to change. In July 1989, legislation was enacted to authorize limited stakes casino gaming on riverboats in Iowa, quickly followed by the authorization of limited stakes gambling in the former mining town of Deadwood, South Dakota in November 1989. Between 1991 and 1996, over one hundred new casinos opened across seven states that newly legalized casino gambling. Accordingly, this is the period we study to exploit the initial wave of casino openings in the U.S. and determine the potential effect that increased exposure to risk taking through gambling has on financial risk taking.

In order to evaluate the effect of increased risk taking as a result of gambling at casinos, the first step is to identify the investors who are likely to gamble. Since individuals who gamble are the ones likely to visit a new casino and, as a result, be exposed to increased risk taking, we must distinguish these gamblers from non-gamblers. The set of individuals who are not likely to gamble are presumably unaffected by a new casino opening and will serve as the control group. The data set that contains monthly household portfolio positions and trades from 1991 to 1996 is from a large U.S. discount brokerage. This data set also contains demographic and zip code data for a subset of investors, but does not contain direct information about each investor's gambling behavior. Thus, we must take an additional step to indirectly infer an investor's propensity to gamble using their demographic and geographic characteristics.

To estimate each brokerage investor's propensity to gamble, we construct a survey data set, separate from and unconnected to the brokerage data, that contains information on respondents'

[1] Casinos themselves are designed to be full of stimuli, such as flashing lights and free drinks served by attractive people, to induce a state of positive arousal to elicit increased risk taking.

gambling behavior, as well as their demographic and geographic characteristics. Using the survey data, we estimate a predictive model of gambling behavior using an individual's demographic and geographic characteristics as explanatory variables. Once the predictive model is estimated, it can be applied to estimate the propensity to gamble for investors in the brokerage data set. In other words, we estimate a "propensity to gamble score" for each brokerage investor to proxy for that investor's propensity to visit a casino and gamble, based on their demographic and geographic characteristics.

To summarize, we make use of two separate data sets.[2] Survey data is used to estimate a predictive model of gambling behavior using demographic and geographic characteristics as explanatory variables. This fitted model is then applied to the second data set, which contains brokerage portfolio holdings in addition to investor demographic and geographic characteristics, to estimate a propensity to gamble score for each brokerage investor. This brokerage data set is supplemented with the opening dates and locations of U.S. casinos that opened during the sample period. The final sample used is comprised of brokerage investors residing within 50 miles, or approximately a one-hour drive, from a casino that opened during the sample period.[3] Within this sample, the propensity to gamble score estimated for each investor allows us to differentiate those likely to visit the casino and be exposed to increased risk taking (the treatment group) from those who are unlikely to visit the casino and are not exposed to changes in risk taking (the control group). Having differentiated the treatment and control groups, we use a difference-in-differences methodology to identify the differential effect of the newly-opened casino on the financial risk taking of those likely to be affected by it and those who are not.

As hypothesized, we find that those who are more likely to gamble take on more risk in their portfolios after the opening of a casino nearby relative to those who are unlikely to visit the casino. Furthermore, likely gamblers earn higher returns as a result of this shift in risk exposure, relative to unlikely gamblers, suggesting that the increased portfolio risk exposure does not go unrewarded. However, likely gamblers do not realize any change in mean-variance efficiency relative to unlikely gamblers after the casino opening. Robustness checks confirm that the casino opening is indeed the driving force of the effect. These results suggest that access to risk taking in the form of

[2] Several recent papers in the behavioral and household finance literatures rely on two distinct datasets when examining investment decisions in relation to a particular preference or behavior (see for example Guiso et al. (2013); Chang et al. (2013); Bonaparte et al. (2012)). The dataset containing individual portfolio holdings and trades often does not include supplementary information to determine preferences or to understand the underlying mechanism of a particular effect; thus, the use of an additional, unrelated data set can provide additional insight into these relationships.

[3] We focus on the 50-mile subsample for our primary analysis, but for robustness, repeat the main analysis using a 100-mile subsample in Table 8.

casino-type gambling perpetuates the propensity of likely gamblers to take greater risks in their portfolios. This effect is potentially induced by excitement from the initial risk taking. The idea that risk taking behavior can perpetuate further risk taking is not entirely new. Studies specifically studying casino-type gambling consistently find that direct exposure to gambling activities, such as roulette or blackjack, increased the level of monetary risk taking in individuals in subsequent trials. Ladouceur et al. (1987) find that even with breaks of at least 24 hours between plays, subjects who had gambled previously subsequently bet more and took riskier bets than those who had not previously gambled. This paper is distinct because it provides the first evidence that increased risk taking in one context may induce greater risk-taking in *investment* decisions in a non-laboratory setting.

This study primarily contributes to two strands of literature. First, we contribute to the literature showing that risk taking can vary over time. At the aggregate level, Saunders (1993) and Hirshleifer and Shumway (2003) show that changes in mood due to the amount of sunshine on a particular day can impact the stock market. Kamstra et al. (2003) demonstrate that depression and "winter blues" due to less sunlight exposure in the winter months can also affect aggregate stock market returns. At an individual-investor level, Malmendier and Nagel (2011) show that individual experiences of macroeconomic shocks can affect investor risk taking; those who experienced low stock market performance over their lives are less likely to invest in the stock market and invest a lower fraction of their liquid assets in stocks if they participate. Additionally, the alignment of political climate with the political identity of investors can also affect the portfolio investments and allocations of individuals (Bonaparte et al., 2012). Most significantly, this study contributes to the literature linking emotions to financial risk taking. Guiso et al. (2013) examine investors' risk aversion prior to and following the 2008 financial crisis and find that risk aversion increases substantially after the crisis; however, the increase in risk aversion appears to be driven by fear, as opposed to standard factors such as wealth or background risk. Positive emotions tend to have the opposite effect on risk taking. The psychology and neuroscience literatures have shown that parts of the brain show activation in anticipation of monetary gains; activation in these parts of the brain have been associated with positive emotions such as excitement (Breiter et al., 2001; Knutson et al., 2001). Kuhnen and Knutson (2011) show that changes in emotional states have the ability to alter both the beliefs and preferences of subjects' risk-taking behavior. This paper is unique, however, because it provides the first non-experimental evidence that increased financial risk taking can potentially result from changes in emotional state induced by increased non-investment risk taking.

Second, this paper contributes to the literature linking investment behavior with gambling preferences and "sensation seeking," a personality trait defined by the search for varied, novel, and intense experiences and feelings. Gambling and sensation seeking have been linked with higher turnover (Dorn and Sengmueller, 2009; Grinblatt and Keloharju, 2009), preference for lottery-type stocks (Kumar, 2009), and more active positions on household balance sheets (Li, 2012). These papers study the cross-sectional relationship between gambling tendencies and investment behaviors, whereas in this paper, we study *changes* in investment risk taking as a direct result of increased risk-taking behavior outside of investments.

Several recent papers study the connection between stock market turnover and lotteries to evaluate whether individuals substitute between trading in financial markets and playing lotteries. Barber et al. (2009) document that the introduction of the government-sponsored lottery in Taiwan reduced turnover on the Taiwan Stock Exchange (TSE) by one-fourth. Two studies take a closer look at this relationship using the size of lottery jackpots. Gao and Lin (2011) find that aggregate trading on the TSE decreases on days where lotteries with large jackpots are drawn. Similarly, Dorn et al. (2012) find a negative relationship between aggregate small trade participation in the stock market and the size of lottery jackpots in the U.S., as well as for individual investors in Germany. This article differs from theirs in several ways. First, their studies focus on trading and whether investors substitute between playing the lottery and stock trading; we concentrate on the effect that increased risk taking, as proxied by access to casinos for gamblers, has on *risk taking* in financial investments.[4] Second, Gao and Lin (2011) and Dorn et al. (2012) use variations in lottery jackpots as repeated shocks to gambling demand at the national or state level, whereas we are able to identify the individuals most likely to go to a casino and use casino openings as a one-time permanent shock to investors across various locations, at different points in time. This setup allows us to isolate an event that potentially alters risk taking for those who visit the casino in comparison to those who do not. Finally, their papers examine the change in turnover on the days surrounding large lottery jackpot drawings using high frequency data. Our paper on the other hand, examines investment behavior at a monthly frequency.[5]

[4]Furthermore, state lotteries already exist in six of the seven states we examine by the start of the sample period, so the effect of casino openings that we evaluate is in addition to any effect that state lotteries may have on investment behavior.

[5]The findings in this study are not inconsistent with theirs. In untabulated results, we find that, consistent with their results, portfolio turnover decreases for likely gamblers versus unlikely gamblers after a casino opening, but the decrease is statistically insignificant in this setting. It is possible that individuals trade less on days following a visit to the casino, but without knowing exactly which days investors go to the casino, we are not able to precisely determine the short-term effects that casino visits have on turnover.

This is the first study, to the best of our knowledge, to hypothesize and test the real world implications that risk taking in one context may have on risk taking in financial investments. Many factors have been shown to affect financial risk taking, but never risk taking itself. The proposed setting uniquely allows us to draw a causal relationship between increased risk taking through gambling and subsequent increases in financial risk taking.

The paper is organized as follows. First, we provide institutional background on the initial legalization and opening of U.S. casinos. Next, we outline in more detail the two primary data sets and the methodology used. Lastly, we present results followed by discussion and conclusions.

2 Institutional Background: The Legalization and Opening of Commercial Casinos in the U.S

Gambling is legal under U.S. federal law; the responsibility to regulate gambling lies with the state. The modern era of casino gaming in the United States began in 1931 when Nevada legalized gaming and enjoyed a monopoly on U.S. gaming until 1976 when Atlantic City began its casino industry. Recessionary economic conditions, federal and state budget deficits, and Americans' changing attitudes toward gambling spurred the growth of the casino gaming industry starting in the late 1980s and continuing well into the 1990s. The initial growth was concentrated in the Midwest and spread to some parts of the South. Iowa and South Dakota legalized commercial gambling in 1989, followed by Illinois, Mississippi, and Colorado in 1990, Louisiana in 1991, Missouri in 1992, and Indiana in 1993. Of these states, seven saw the initial opening of casinos between 1991 and 1996. New casinos opened in Iowa starting in April 1991, in Colorado starting in October 1991, in Illinois starting in September 1991, in Mississippi starting in August 1992, in Louisiana starting in October 1993, in Missouri starting in May 1994, and in Indiana starting in December 1995.[6]

Between 1991 and 1996, over one hundred new casinos opened across these seven states, making it an ideal period to examine the effect that increased risk taking, facilitated by casino openings, has on financial risk taking. We hand collect the opening dates and zip codes of all casinos that opened in the U.S. from the beginning of 1991 to the end of 1996.[7] The majority of this information

[6]Additional details on the history and economics of casino gambling in the U.S. can be found in Eadington (1999). In addition to casinos, slot machines, poker machines, and video lottery terminals outside of casinos were also legalized in many states in the late 1980s and 1990s, but these devices are less centralized and tend to be spread over independent bars and taverns.

[7]We use casino opening dates, as opposed to gambling legalization dates by state, in order to isolate the effect that increased risk taking, as a result of visiting casinos, has on financial risk taking.

is obtained from the annual reports and Web sites of state gaming associations.[8] Table 1 lists the 61 casino openings in unique zip codes that we use in our sample along with the month and year of the opening, as well as the state and zip code where the casino was originally located.[9] Figure 1 shows the zip code locations of these 61 casinos.

3 Data and Methodology

The goal in this paper is to test whether increased risk taking in one context translates to increased financial risk taking. We use initial casino openings in the U.S. as a natural experiment to test this hypothesis and rely on two separate data sets to do so. The first data set is hand-collected survey data linking an individual's propensity to gamble with their demographic and geographic characteristics, which we will simply refer to as the "survey data". The second data set, which we refer to as the "brokerage data," contains investor portfolio holdings from a large U.S. discount brokerage supplemented with information on casino opening dates and locations. The two data sets are not connected, but will each play an important role.

Empirically, we want to identify the differential effect of the newly-opened casino on the financial risk taking of a treatment group of investors likely to be affected by the casino opening and a control group of investors unlikely to be affected by the casino opening. That is, we want to compare the change in financial risk taking between gamblers likely to visit the casino and non-gamblers unlikely to visit the casino. The brokerage data contains the necessary portfolio holdings data, but does not identify which investors are likely to gamble; thus, we identify likely gamblers in the brokerage data in two additional steps. First, the survey data is used to estimate a predictive model to determine the demographic and geographic characteristics that predict an individual's gambling behavior. For any given individual, this predictive model of gambling behavior allows us to estimate that individual's propensity to gamble (the dependent variable) if we know the values of their demographic and geographic characteristics (the explanatory variables). Fortunately, the brokerage data contains demographic and geographic characteristics for each investor; in the second step, we apply the parameter estimates from the predictive model to these demographic and geographic characteristics to estimate each brokerage investor's propensity to gamble. This estimated

[8]Some states do not provide historical annual reports going back to the early 1990's. In these cases, we track down the information from secondary sources such as the Museum of Gaming History Web site (http://www.museumofgaminghistory.org). Where possible, we verify the accuracy of secondary sources using multiple sources. In the case of riverboat casinos, the zip code of the headquarter or loading dock is used.

[9]While 101 casinos opened in the U.S. during the sample period, they opened in only 61 unique zip codes. Since zip codes are used to identify distance between casinos and investors, only the first casino to open in any particular zip code is of interest in our analysis.

"propensity to gamble score" distinguishes the set of investors who are likely to gamble, and thus visit a new casino, from the set of investors who are not likely to do so. Having differentiated the treatment group from the control group, we use a difference-in-differences methodology to estimate the differential effect that the casino opening has on the treatment group of likely gamblers versus the control group of unlikely gamblers.

In this section, we first outline the survey data and the estimation of the predictive regression for gambling behavior. Next, we describe the brokerage data and the main subsample used in our analysis. Lastly, we will describe in detail the difference-in-differences methodology used to estimate the main results.

3.1 Identifying Gamblers

The first step is to distinguish the investors who are most likely to visit the casino and gamble from those who are least likely to do so. To do this, we estimate a predictive model of gambling behavior using demographic and geographic variables collected from survey respondents. By applying the covariates from the predictive regression to the demographic and geographic variables in the brokerage data set, we can predict the likelihood of gambling behavior for investors in the brokerage data. This methodology, while potentially noisy, is useful when the data set of interest contains only demographic and geographic characteristics, but no measure of gambling behavior, the variable of interest.[10]

3.1.1 Survey Sample

We collect survey data using Amazon Mechanical Turk (MTurk), an online marketplace where individuals, referred to as workers, complete tasks over the internet in exchange for monetary compensation. Individual workers are able to access the platform and look for tasks posted by requesters whenever they choose and can browse the payment offered, as well as a summary detailing the nature of the task. Workers then choose the tasks that they wish to complete; upon completion, Amazon transfers payment from requesters to workers.

MTurk has become increasingly popular among social scientists as a source of survey and experimental data because of the vast supply of diverse workers. The demographics of workers on MTurk have been shown to be roughly representative of the U.S. population and are much more

[10]Gambling behavior is undoubtedly linked with other demographic, social, and environmental factors, but we are limited to the set of demographic characteristics available in the second data set, for which we want to estimate a propensity to gamble score.

so than that of undergraduate students (Buhrmester et al., 2011).[11]

Data was collected from 1,883 unique respondents in the U.S. during October and November of 2012. All participants are at least 18 years of age and own financial investments. After applying data consistency and attention screens, we have unique data on a sample of 1,750 investors. Panel A of Table 2 shows the characteristics of the survey sample. Comparing the survey sample to the full brokerage sample shown in Panel B, we see that the average survey respondent tends to be younger, more female, more likely to have at least one child, and less likely to be married or retired, relative to the brokerage sample. The median age of 31 in the survey sample is not far from the median age of 37.1 in the U.S. population in 2012 (CIA World Factbook, 2012). The proportion of males in the survey sample, 52.6%, is also lower than that of the brokerage sample, but is comparable to the 49% of males in the U.S. population (CIA World Factbook, 2012). The average household income of $61,929 in the survey sample is lower than that of the brokerage data, but is not far from the median income of $50,502 in the U.S. in 2012 (Noss, 2012). Since we are using these demographic characteristics to predict gambling behavior, a survey sample representative of the U.S. population is ideal to estimate the predictive ability of demographic and geographic characteristics for gambling behavior.

3.1.2 Predicting the Likelihood of Gambling Participation

To identify the characteristics that predict an individual's propensity to gamble, we ask respondents about their current gambling behavior and the types of gambling in which they partake. Panel A of Table 2 shows that 43.5% of the survey respondents currently participate in some form of gambling, including but not limited to lotteries, poker, blackjack, roulette, and slot machines. 37.8% of respondents partakes in some form of gambling outside of lotteries.

Table 3 shows the demographic characteristics of survey respondents who gamble versus those who do not. Panel A shows difference in mean characteristics between those who currently participate in some form of gambling and those who do not. Panel B shows differences based on a refinement of this measure, which only includes individuals who currently gamble in some form outside of lotteries; this refined measure more precisely identifies those individuals who are most likely to visit casinos because they engage in casino-type gambling. The right-most column shows the t-test of the difference between characteristics of gamblers versus non-gamblers. Consistent

[11] In general, MTurk participants are generally more female (65%) than male, approximately 36 years old on average, have education levels higher than the general U.S. population, and have incomes that roughly match the income distribution in the U.S. (Paolacci et al., 2010; Ipeirotis, 2010).

with findings in Li (2012), gamblers tend to be significantly older and have higher incomes. They are also more likely to be male, married, and retired, but not significantly so in this sample.

Next, we estimate a predictive model using gambling behavior as the dependent variable and demographics and state dummies as the explanatory variables. State fixed effects proxy for geographically linked variables that influence gambling behavior such as religion (Kumar et al., 2011). Table 4 shows the parameter estimates from the predictive model estimated using logit regressions on the survey data. Parameter estimates for state dummies have been omitted for brevity. In column (1), the dependent variable is an indicator that equals one if the respondent currently gambles and zero otherwise. In column (2), the dependent variable equals one if the respondent currently gambles outside of lotteries and zero otherwise. In both regressions, we see that consistent with the summary statistics, males, older individuals, and individuals with higher incomes are more likely to gamble. Married individuals are less likely to gamble outside of lotteries.

3.2 Discount Brokerage Data and Sample

The second data set contains monthly portfolio positions and trades from a large U.S. discount brokerage for the accounts of 77,995 investors from January 1991 to November 1996.[12] The initial sample we consider are the 62,532 investors who hold common stocks. Demographic measures and zip code data is available for a subset of 40,098 investors.[13] The portfolio holdings data is supplemented with monthly and daily stock data from CRSP.

We apply the parameter estimates from Table 4 to the demographic and state variables in the brokerage data set to estimate the probability of being a gambler for each investor. Table 5 shows the summary statistics for investors in the brokerage data set sorted into quintiles based on their estimated propensity for non-lottery gambling.[14] The right-most column contains t-tests of the difference in characteristics between individuals with a predicted propensity to gamble in the lowest quintile and individuals with a predicted propensity to gamble in the highest quintile. Consistent with the survey sample, Panel A shows that those most likely to gamble are on average older, have higher incomes, more likely to be male and retired, and are less likely to be married or have children. Panel B shows mean investor portfolio characteristics prior to the opening of a casino. We see that portfolio characteristics do not differ significantly between those least likely to gamble and those most likely to gamble, with the exception of the Sharpe ratio. Unlikely gamblers

[12] More details on the discount brokerage database are available in Barber and Odean (2000, 2001).

[13] The demographic measures were compiled by Infobase Inc. in June 1997.

[14] Summary statistics for investors sorted into quintiles based on their estimated propensity to gamble in any form are similar, but omitted for brevity.

(quintile 1) have an average Sharpe ratio that is significantly larger than that of likely gamblers (quintile 5), however, this difference is not monotonic across the quintiles sorted based on propensity to gamble.

3.2.1 Investor Proximity to New Casinos

To supplement the brokerage data, we hand collect the opening dates and zip codes of all casinos that opened in the U.S. from the beginning of 1991 to the end of 1996. The sample of casino openings is shown chronologically in Table 1. In particular, we are interested in the first casino that opens in a particular zip code. The reason for this is because we are interested in the date that an investor is first located within a certain distance from a casino and the distance between investors and casinos is computed based on their zip codes. Thus, the goal is to identify for each investor, the date the first casino opens within 50 miles, or approximately a one hour drive, of a casino in the sample.[15] To identify the subsample of brokerage investors located within 50 miles of a casino, we calculate the distance between the zip code of each casino and each investor. The longitude and latitude for each zip code is obtained from the Gazetteer Place and Zip Code Database available from the U.S. Census Bureau (1990) and is supplemented with zip code data from the CivicSpace U.S. ZIP Code Database (CivicSpace Labs, 2004). We use a standard formula for calculating the shortest distance in miles between two points on a map, often referred to as the great-circle distance formula. The two points, $p = (a_1, b_1)$ and $q = (a_2, b_2)$, are represented as latitudes (a_1 and a_2) and longitudes (b_1 and b_2), and the distance between them, $d(p, q)$, is calculated as follows:

$$d(p,q) = r \times arccos[cos(a_1)cos(b_1)cos(a_2)cos(b_2) + cos(a_1)sin(b_1)cos(a_2)sin(b_2) + sin(a_1)sin(a_2)], \quad (1)$$

where r is the radius of the Earth, or approximately 3950 miles.

Using this formula, we calculate the distance between each investor's location and each new casino and record the opening date of the *first* casino that opens within 50 miles of each investor in the sample. The casino opening dates serve as the treatment date we use to compare pre- and post-treatment differences in financial risk taking. We are only interested in the effect of the first casino that opens near an investor; thus, once a casino opens within 50 miles of an investor, that investor is linked with that casino and treatment date and no others. This is to ensure that we capture the effect of the initial casino opening. The two right-most columns of Table 1 indicate the number of investors in the brokerage data set that are within 50- and 100-mile radiuses of each

[15] We focus on the 50-mile subsample for our primary analysis, but for robustness, repeat the main analysis using a 100-mile subsample (Table 8).

casino. The number of investors listed for each casino is incremental, meaning that if a particular investor is linked to a prior casino opening, they are not counted again; thus, there are 1,769 unique investors living within 50 miles of a casino in the sample.[16]

The main subsample of interest is comprised of all brokerage investors who live within a 50-mile radius of a casino that opened in the sample period; we refer to this as the 50-mile subsample. Within this subsample, the treatment group are those investors most likely to go to the casino to gamble; the control group are those investors who are unlikely to go to the casino, and are not exposed to any changes in risk taking as a result of the casino opening. Thus, the treatment effect is the differential impact of the newly-opened casino on those who are likely to visit it versus those who are not.

3.3 Methodology

3.3.1 Motivation

To motivate our identification strategy, we present a graphical representation of the difference in portfolio risk exposure between those likely to gamble versus those unlikely to gamble, before and after a casino opening. To measure financial risk taking, we compute an ex ante portfolio beta for each month using a value-weighted average of the CAPM betas of each stock in the investor's portfolio estimated using monthly returns data over the preceding 36 months. Next, we calculate the mean difference in ex ante portfolio beta between likely gamblers with an estimated gambling propensity in the highest quintile and unlikely gamblers with a gambling propensity in the lowest quintile. Figure 2 shows the annual mean difference for the three years surrounding the casino opening, which is represented by the blue dotted line. Prior to the casino opening, the mean difference between the ex ante portfolio betas of those most likely to gamble and those least likely to gamble is close to zero. However, after the casino opens, the difference increases to 0.06 in the year following the opening and continues to increase slightly in the two subsequent years. This simple graph shows that relative to unlikely gamblers, likely gamblers tend to increase their portfolio betas subsequent to a casino opening. Below, we describe in more detail the difference-in-differences strategy and how we implement this approach more rigorously in a regression framework.

[16]In Table 1, the fourteenth casino opening (Empress I) in Illinois is located within 50 miles of Chicago and thus all investors in the sample living in or around Chicago are included in the sample. Since there is a large population in Chicago, this particular casino opening contributes to half of the total sample of investors who are located within 50 miles of a casino. To ensure that this one casino is not driving the results, we repeat all tests excluding the investors related to this casino opening and find that results are qualitatively identical.

3.3.2 Difference-in-Differences Strategy

The empirical strategy in this paper takes advantage of several features of U.S. casino openings to implement a difference-in-differences methodology and establish the causal effect of increased risk taking, as a result of visiting newly-opened casinos, on the financial risk taking of likely gamblers. The goal is to compare the change in financial risk taking of likely gamblers (the treatment sample) after the opening of the casino (the treatment) to the change in financial risk taking of a comparable group of unlikely gamblers (the control sample) who are ideally unaffected by the opening of the casino. In an ideal experimental setup, we would compare the financial risk taking of an individual before and after they begin to visit a new casino to the same individual's financial risk taking before and after the casino opening had they *not* visited the casino (the counterfactual). Since the counterfactual is unobservable, instead we use the risk-taking behavior of the control sample after the casino opens to proxy for the unobservable counterfactual risk-taking behavior of the treatment sample of likely gamblers had they *not* visited the casino. To the extent that the treatment and control groups are similar pre-treatment, any changes in risk-taking behavior post-treatment can be interpreted as the causal effect of visiting the newly-opened casino.

Two important assumptions are necessary for drawing a strong causal inference using the difference-in-differences approach (Imbens and Wooldridge, 2009). First, the treatment should be exogenous to the treated sample; that is, the opening of a casino should be exogenous to those who will visit it. The treatment group is identified based on the propensity to gamble score estimated from demographic and geographic characteristics that are predictive of gambling behavior. Some of these characteristics, such as age and gender, cannot be chosen by an individual; thus, members of the brokerage sample identified as likely gamblers did not elect to be part of the treatment group.

One potential limitation of the brokerage data, however, is that each investor's zip code is collected only once at the end of the sample period; we do not have information about each individual's location at the beginning of the sample period. Thus, it is possible that some individuals moved during the sample period. It is important to clarify here that in instances where this is the case, these people self selected into the *sample*, but they *did not* self select into the *treatment group* of likely gamblers since the propensity to gamble score is estimated based on demographic characteristics, which are unlikely to change as the result of a move.[17] Thus, to the extent that the opening of a casino was not the choice of the treatment group of likely gamblers in the sample, the endogeneity issue is not a serious cause for concern.

[17] The issue of self selection into the sample is addressed in the Discussion section.

Second, a reliable causal inference requires that the treatment and control samples be drawn from similar distributions (Imbens and Wooldridge, 2009). This assumption implies that the likely gamblers should be similar to the unlikely gamblers in order to use the observable financial risk taking of the unlikely gamblers as a valid proxy for the likely gamblers' unobservable counterfactual. By construction, predicting the propensity of an individual to gamble using their demographic characteristics imposes restrictions on how similar likely and unlikely gamblers can be demographically. However, since financial risk taking is the variable of interest, it is only necessary to show that likely and unlikely gamblers hold similar portfolios before the casino opens.

Panel B in Table 5 shows the pre-treatment portfolio characteristics of investors sorted into quintiles based on their predicted propensity to gamble outside of lotteries. As previously noted, the portfolio characteristics, particularly those measuring financial risk exposure, look remarkably similar, except for Sharpe ratio. While Sharpe ratios are significantly different on average between those in the lowest quintile and those in the highest, the difference is not monotonic across quintiles sorted based on propensity to gamble. Upon closer inspection, the correlation between propensity to gamble and Sharpe ratio is 1.3% and statistically insignificant.

3.3.3 Estimation Equation

We implement the difference-in-differences approach using a regression framework to estimate the change in financial risk taking in the treatment group relative to the control group before and after the casino opening. Financial risk taking is quantified by three ex ante measures of portfolio risk. First, ex ante weighted portfolio beta is a monthly value-weighted average of the CAPM betas of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months.[18] We supplement the ex ante portfolio beta measure of risk taking with ex ante weighted stock volatility, the value-weighted average of the volatility of each stock in the investor's portfolio estimated for each month using monthly performance data over the preceding 36 months. The last measure of financial risk taking, ex ante portfolio volatility, is constructed for each investor as the standard deviation of the monthly returns of the securities in their portfolio over the preceding 36 months. In particular, portfolio volatility takes into account both the variances and covariances of the stocks in the portfolios of each investor. All three measures of portfolio risk are computed on a monthly basis and reflect the risk investors would expect at the time of portfolio formation based on prior performance.

[18] All results are extremely similar using portfolio betas estimated using the three- and four-factor models.

We estimate a difference-in-differences regression of the following form using the 50-mile subsample:

$$Y_{it} = \gamma_i + \delta_t + \lambda X_{it} + \theta(TrmtGroup_i \times AfterTrmt_{it}) + \epsilon_{it}. \quad (2)$$

Y_{it} is a measure of portfolio risk for investor i in month t. $TrmtGroup_i$ is a variable indicating the propensity to gamble for each investor i. In cases where quintile or tercile analysis is used, $TrmtGroup_i$ is an indicator variable that equals one for investors who are in the top quintile or tercile sorted based on propensity to gamble (the treatment group) and zero for those in the bottom quintile or tercile (the control group). $AfterTrmt_t$ is an indicator that equals one if the casino near investor i has opened by time t.

X_{it} is a set of investor specific time-varying controls including portfolio size and number of stocks in the portfolio to control for changes in wealth and diversification. γ_i and δ_t are household and month fixed effects, respectively. Household fixed effects control for the effects of unobservable household characteristics that may affect risk taking. Month fixed effects control for any macroeconomic trends affecting households such as stock market conditions and unemployment rates. Standard errors are clustered by household.

The coefficient of interest, θ, captures the differential effect of casino opening on the treatment sample relative to the control sample (the treatment effect); it is the estimated difference between likely gamblers and unlikely gamblers in their respective pre- and post-treatment portfolio risk exposure. A positive θ suggests that, consistent with the hypothesis, the treatment has positively affected the portfolio risk of likely gamblers relative to unlikely gamblers.

4 Results

4.1 Baseline Regression Estimates

The first set of regression results from estimating Equation (2) support the hypothesis that likely gamblers take on more portfolio risk after being exposed to higher risk taking through gambling. Table 6 shows results from regressing a measure of portfolio risk on that investor's propensity to gamble interacted with an indicator that equals one after a casino opening near that investor and zero otherwise. In Panel A, the dependent variable is the ex ante weighted portfolio beta. The positive coefficient in column (1) indicates that investors who have a higher predicted propensity to gamble increase the portfolio beta exposure in their portfolios after a casino opens nearby; however, this increase is statistically insignificant. Columns (2) and (3) show results from regressions that use a quintile and tercile version of the propensity gamble score whereby the variable equals one for investors in the top quintile or tercile of investors in the sample and equals zero for investors in the lowest quintile or tercile, respectively. The result in column (3) indicates that the effect persists when comparing the top third of those most likely to gamble relative to the bottom third, which suggests that this result is not confined to a small subset of investors who are especially prone to gambling.

Columns (4) to (6) show regressions similar to those in columns (1) to (3), but use a propensity to gamble score estimated for individuals who currently gamble in some form outside of lotteries. Not surprisingly, results using the measure of non-lottery gambling propensity are slightly stronger both economically and statistically since those who are more likely to participate in casino-type gambling are more likely to visit casinos and thus, be exposed to increased risk taking. In economic terms, the coefficient estimate of 0.0808 in column (5) indicates that investors in the top quintile of likely gamblers increase the weighted portfolio beta risk exposure in their portfolios by 0.0808 after a casino opens, relative to unlikely gamblers. This represents an increase of 7.24% after a casino opening for investors in the top quintile of likely gamblers relative to their mean pre-casino opening ex ante portfolio beta of 1.116.

Panel B of Table 6 shows regression estimates similar to those in Table 6, but use ex ante weight stock volatility as the dependent variable. Results are consistent with those in Panel A and again stronger in columns (4) to (6) using the non-lottery gambling propensity score. The coefficient estimate of 0.0029 in column (5) suggests that the quintile of investors most likely to gamble increase the weighted stock volatility exposure in their portfolios by 9.06% after a casino opening relative to their pre-treatment average. The percentage increase in weighted stock volatility for likely investors is comparable to that of ex ante weighted portfolio beta.

Panel C shows results using the ex ante portfolio volatility as the dependent variable. Results are again consistent with those in Panels A and B and show that likely gamblers increase the ex ante portfolio volatility of their portfolios after a casino opening relative to unlikely gamblers. Those in the highest quintile of likely gamblers increase the ex ante portfolio volatility of their portfolios by 8.32% after the casino opening, relative to their pre-treatment average. For brevity, we only show results using the non-lottery gambling propensity score in the remainder of the paper and refer to it simply as the "propensity to gamble score"; results are similar using the broader measure as well.

4.2 Distribution of Treatment Effect

The results in the previous section establish the mean effect of casino openings on likely gamblers relative to unlikely gamblers, but does not shed light on the distribution of the effect across different demographics. Table 7 addresses this issue by interacting the $TrmtGroup_i \times AfterTrmt_{it}$ term with the demographic characteristics of investors. The treatment group is represented by an indicator variable that equals one for the quintile of investors most likely to gamble and zero for the quintile of investors least likely to gamble.

Panel A shows results using ex ante weighted portfolio beta as the dependent variable. Column (1) shows that controlling for demographic characteristics interacted with an indicator that equals one after a casino opening, the effect of being in the top quintile of investors most likely to gamble is still significantly positive relative to the same regression without demographic controls shown in column (5) of Table 6. This regression is of particular interest because it shows that the *combination* of demographic characteristics estimated using the predictive regression that form the propensity to gamble score picks up an additional unobservable attribute, which affects financial risk taking, that the individual demographic characteristics alone cannot capture. The effect is similar for ex ante weighted stock volatility in column (1) of Panel B and for ex ante portfolio volatility in column (1) of Panel C.

Columns (2) to (7) of Panel A show results interacting a demographic characteristic with $TrmtGroup_i \times AfterTrmt_{it}$. These regression also controls for the effect of each of the demographic characteristics of interest interacted with $After\ Casino_{it}$ to determine the role of demographic of likely gamblers that most contribute to the change in risk taking. These regressions show that likely gamblers who are older, male, married, and have higher incomes experience the most significant increases in portfolio risk taking relative to unlikely gamblers. The results are consistent using ex ante weighted stock volatility and ex ante portfolio beta in Panels B and C, respectively.

4.3 Does Proximity to a Casino Matter?

In the above analysis, we focus on the 50-mile subsample of investors located within approximately a one-hour drive of a casino, a reasonable distance for those who are likely to visit the casino repeatedly. We should expect to see the effect of casinos on likely gamblers relative to unlikely gamblers diminish as we include investors living farther away. Using a 100-mile radius around the casino will include investors who are approximately a two-hour drive away and have a reduced likelihood of frequent casino visits.

Table 8 shows results using a 100-mile subsample. As expected, columns (1) to (3) show that results using ex ante portfolio beta as the dependent variable are much less significant both economically and statistically relative to results using the 50-mile subsample in Panel A of Table 6. In columns (4) to (6), we see that results are still significant when examining ex ante weighted stock volatility, although slightly less so, both statistically and economically, than when considering the sample of investors who reside closer to the casino. Columns (7) to (9) show results using ex ante portfolio volatility as the dependent variable. Results using the propensity to gamble score are smaller in magnitude and less significant in columns (7) and (8) than analogous results using the 50-mile subsample in Panel C of Table 6. The results in column (9) comparing the change in ex ante portfolio volatility between the tercile of those most likely to gamble versus the tercile least likely to gamble after a casino opening are slightly more significant in the 100-mile subsample relative to the 50-mile subsample, but is of a similar magnitude. These results suggest that the documented effect is specific to the location of the casino, but persists significantly for two of the three measures of portfolio risk even when considering investors within a 100-mile radius of a casino opening.

4.4 Treatment Dynamics

To further ensure that the casino opening is in fact the driving force of the change in behavior between likely and unlikely gamblers, we consider the dynamics of the change in risk taking in more detail surrounding the casino opening. We estimate the following regression:

$$\begin{aligned} Y_{it} = \gamma_i + \delta_t + \lambda X_{it} \quad &+ \quad \theta_{-2}(TrmtGroup_i \times AfterTrmt_{it}^{-2}) \\ &+ \quad \theta_{-1}(TrmtGroup_i \times AfterTrmt_{it}^{-1}) \\ &+ \quad \theta(TrmtGroup_i \times AfterTrmt_{it}) + \epsilon_{it}, \end{aligned} \tag{3}$$

which includes two additional terms to capture leads relative to Equation (2). $AfterTrmt_{it}^{-1}$ is an indicator that equals one in the 12 months prior to the casino opening and zero otherwise; that is, it equals 1 for months -1 to -12 relative to the casino opening and zero otherwise. Similarly, $AfterTrmt_{it}^{-2}$ equals one for months -13 to -24 relative to the casino opening and zero otherwise.

Table 9 shows regression results from the above model using each of the three measures of portfolio risk taking as the dependent variable. The treatment group is represented by an indicator variable that equals one for the quintile of investors most likely to gamble and zero for the quintile of investors least likely to gamble.

Column (1) in Table 9 shows the results from the above regression using ex ante weighted portfolio beta as the dependent variable. We see that there is no significant change in investor portfolio risk until after the casino opens. Next, we break down the $AfterTrmt_{it}$ variable further to more sharply observe when the effect starts and whether it remains. $AfterTrmt^{s}_{it}$ is an indicator variable that equals one for the s^{th} year after the casino opening and $AfterTrmt^{>s}_{it}$ is an indicator that equals one if the casino opened strictly more than s years ago. In columns (2) and (3), we see that the increase in ex ante weighted portfolio beta starts right after the casino opens and continues well past the second year of operation; thus, it does not seem that this effect is temporary, declining when the novelty of the new casino wears off. Columns (4) to (6) show analogous results using ex ante weighted stock volatility as the dependent variable. While the increase in risk taking for the top quintile of likely gamblers is not statistically significant until year two after the casino opening, there is an increase in both the magnitude and t-statistic of the estimate in the year following the casino opening. Results are similar in columns (7) to (9) using the ex ante portfolio volatility as the dependent variable. These results serve as a useful consistency check to ensure that the effect happens as a result of the casino opening.

4.5 Increased Risk Taking and Performance

A natural question to ask is how the portfolios of likely gamblers perform relative to unlikely gamblers in light of the increased risk taking. To shed light on this question, we estimate the following difference-in-differences regression:

$$P_{it} = \gamma_i + \delta_t + \lambda X_{it} + \theta(TrmtGroup_i \times AfterTrmt_{it}) + \epsilon_{it}. \tag{4}$$

This equation is identical to equation (2), except the dependent variable, P_{it}, is a measure of portfolio performance. The two dependent variables we consider are monthly realized portfolio returns net of transaction costs and ex ante Sharpe ratio.[19] The ex ante Sharpe ratio, $(E[r_j]-r_f)/\sigma_j$, is constructed for each household in each month using the monthly performance of the stocks in each household's portfolio over the preceding 36 months (Mitton and Vorkink, 2007). Similar to the ex ante measures of portfolio beta and portfolio volatility, the Sharpe ratio is an ex ante measure, which reflects the performance investors would expect at the time of portfolio formation based on past information.

Table 10 reports the results from estimating the above regression using the 50-mile subsample. Columns (1) to (3) show that in addition to increasing their ex ante portfolio risk, likely gamblers generally realize higher returns relative to unlikely gamblers subsequent to the opening of the casino.

[19]Note that since we include month fixed effects in the specification, the results from regressions estimated using either net returns or market-adjusted net returns will be identical.

However, we see in columns (4) to (6) that their overall performance ex ante, as measured by the ex ante Sharpe ratio, does not change significantly relative to unlikely gamblers. Thus, while likely gamblers seem to increase both the risk and return of their portfolios relative to unlikely gamblers post treatment, they do not realize an improvement in mean-variance efficiency.

5 Discussion

Three issues warrant further discussion. First, this study explores changes in risk taking within a particular asset class. The data does not allow conclusions about overall asset allocation to be drawn. However, household portfolio allocations tend to be sticky over time due to inertia and change only very slowly over time (Brunnermeier and Nagel, 2008). In untabulated results, we find that the portfolio sizes in the brokerage accounts of likely gamblers increases relative to unlikely gamblers after casino openings at a significance level of approximately 10%. Thus, it is possible, but unlikely that gamblers greatly increase their holdings of safe assets after casino openings to significantly tilt the overall compositions of their financial wealth towards safer assets. Hence, the shift in risk taking in the stock portions of investor portfolios appear to be a reasonable indicator of willingness to take financial risks.

Second, a possible shortcoming of the data is that the subsample of investors who reside near casinos may not be representative of the entire population of investors either because of relocations during the sample period or because casinos tend to open along state borders, which may not have populations in close proximity that are representative of the entire U.S. population. However, the majority of the analysis is done on a relative basis by sorting investors into quintiles or terciles based on their propensity to gamble. Thus, any conclusions drawn are done so on a relative basis. In other words, our results apply to the extent that the behavior of the most likely gamblers *relative* to the least likely gamblers is the same in our subsample as it is in the larger population.

Lastly, the difference-in-differences methodology requires comparison between investors likely to visit a new casino to gamble and investors unlikely to do so. This implicitly assumes that those we characterize as the control group of unlikely gamblers do not visit the casino; however, in reality, we do not know exactly who visits the casinos and who does not. It is possible that the control group of unlikely gamblers also visit the casino and react differently when exposed to the casino environment than the treatment group of likely gamblers. That is, we cannot say definitively whether the change in portfolio risk taking between likely and unlikely gamblers is because unlikely gamblers do not visit the casino or because they react differently when exposed to the risk taking environment in a casino.

6 Conclusions

In this paper, we show that individuals' non-investment risk-taking behavior can affect their willingness to take risks in financial investments. In particular, we use the initial legalization and opening of commercial casinos in the U.S. as a natural experiment to show that the opening of a casino results in increased risk taking in the portfolios of those investors who are likely to visit the casino to gamble, relative to those investors who are not. This study offers the first evidence that exposure to increased risk taking through casino-type gambling may result in increased financial risk taking, potentially induced by excitement from the initial risk taking. This leaves many interesting questions to be explored. Does non-monetary risk taking induce greater risk taking in financial decisions? Does the same effect hold when managers take on more risk when making investment decisions at the firm level as a result of excitement from past risks taken? We leave these questions to future research.

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Figure 1: Map of U.S. Casino Openings

This map shows the locations of the 61 casinos that opened between 1991 and 1996 used in the sample. Each color indicates a different state.

Figure 2: Mean Portfolio Beta Difference Between Likely Gamblers and Unlikely Gamblers

This figure shows the mean annual difference in the CAPM portfolio betas of investors who are most likely to gamble (quintile 5) and those who are least likely to gamble (quintile 1) before and after the casino opens. The blue dotted line indicates the casino opening at time zero.

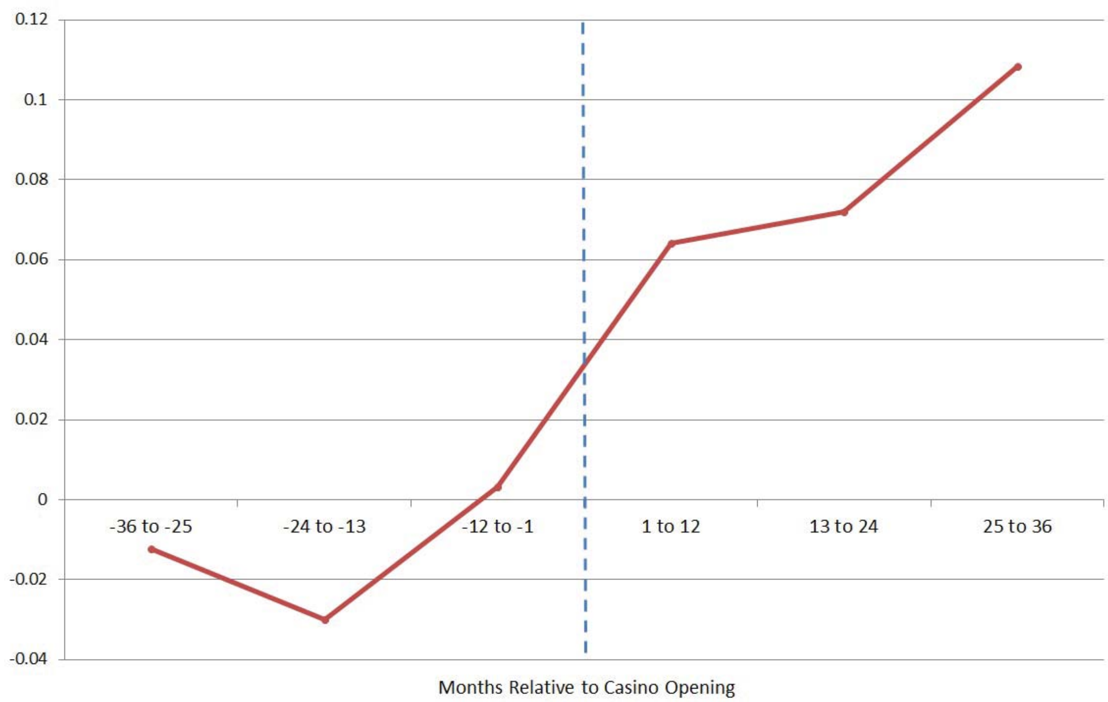

Table 1: Casino Openings

This table lists the 61 casinos that opened in the U.S. from January 1991 through to November 1996, during the discount brokerage data sample period. The table shows the month and year the casino first opened its doors, along with the state and zip code where it was located. The two right-most columns show the number of investors in the discount brokerage data that are within a 50- and 100-mile radius of the casino. Investors are included only once, meaning that once a casino opens within 50 miles of an investor, that investor is linked with that casino and opening date and no others even if another casino opens within 50 miles of that same investor. Thus, the investors linked with each casino below are all unique.

	Date of Opening	Casino	State	Zip Code	# Incremental Investors within 50 Miles	# Incremental Investors within 100 Miles
1.	Apr-91	The Dubuque Casino Belle	IA	52004	8	69
2.	Apr-91	The Diamond Lady	IA	52722	13	22
3.	Apr-91	The President	IA	52801	3	
4.	May-91	The Emerald Lady	IA	52627	4	4
5.	Jun-91	The Mississippi Belle II	IA	52732	1	43
6.	Sep-91	Alton Belle	IL	62002	143	165
7.	Oct-91	Bronco Billy's Sports Bar & Casino	CO	80814	124	264
8.	Oct-91	Johnny Nolon's	CO	80818	1	3
9.	Oct-91	Dostal Alley Saloon & Gambling Emporium	CO	80427	132	12
10.	Nov-91	Par-A-Dice	IL	61611	20	23
11.	Jan-92	The Famous Bonanza	CO	80428	1	2
12.	Mar-92	Casino Rock Island	IL	61201		
13.	May-92	Red Dolly Casino, Inc.	CO	80422		
14.	Jun-92	Empress I	IL	60435	824	870
15.	Jun-92	The Silver Eagle	IL	61025		1
16.	Jun-92	Century Casinos	CO	80816		
17.	Aug-92	Isle of Capri Casino - Biloxi	MS	39530	20	134
18.	Aug-92	President Casino	MS	39531	4	
19.	Aug-92	Midnight Rose Hotel & Casino	CO	80819		
20.	Oct-92	Tunica Casino d/b/a Splash Casino	MS	38664	87	105
21.	Jan-93	The Sioux City Sue	IA	51102	8	62
22.	Feb-93	Players Riverboat Casino	IL	62960	6	24
23.	May-93	Northern Star	IL	60432	4	5
24.	May-93	Grand Casino - Gulfport	MS	39501	2	2
25.	Jun-93	City of Lights I and City of Lights II	IL	60606	48	49
26.	Jun-93	Casino Queen	IL	62201	4	1
27.	Aug-93	Isle of Capri Casino-Vicksburg	MS	39180	7	15
28.	Oct-93	Star	LA	70601	15	32
29.	Feb-94	Hilton - Flamingo	LA	70130	59	16
30.	Mar-94	Las Vegas Casino	MS	38701	1	1
31.	Apr-94	Harrahs	LA	71101	8	14
32.	Apr-94	Treasure Bay Casino	MS	36535	15	15
33.	May-94	The Dubuque Diamond Jo	IA	52001		
34.	May-94	Isle of Capri (Boss.)/Diamond Jacks	LA	71111		
35.	May-94	President Riverboat Casino on the Admiral	MO	63102		
36.	May-94	Casino St. Charles	MO	63302	2	9
37.	Jun-94	Argosy Riverside Casino	MO	64150	89	99
38.	Jun-94	St. Jo Frontier Casino	MO	64501		2
39.	Aug-94	Boomtown	LA	70058		
40.	Sep-94	Treasure Chest	LA	70065	1	
41.	Sep-94	North Star	MO	64116		
42.	Sep-94	Belle of B.R.	LA	70802	12	
43.	Oct-94	Grand Victoria	IL	60120	14	3
44.	Nov-94	The Catfish Bend Casinos	IA	52601		
45.	Dec-94	The Belle of Sioux City	IA	51101		
46.	Dec-94	The Miss Marquette	IA	52158		11
47.	Apr-95	Casino Aztar	MO	63830	5	1
48.	Jun-95	Brass Ass Casino	CO	80813	2	
49.	Jul-95	Bally's	LA	70126		
50.	Jul-95	Isle of Capri (L.C.)	LA	70669	1	
51.	Sep-95	Sam's Town Casino	MO	64118		
52.	Dec-95	Casino Aztar	IN	47708	5	6
53.	Jan-96	Harrahs Council Bluffs Casino & Hotel	IA	51501	16	2
54.	Jun-96	Majestic Star Casino	IN	46402		7
55.	Jun-96	Trump Casino	IN	46406		
56.	Jun-96	Empress Casino Hammond	IN	46320		
57.	Jul-96	Century Casino Cripple Creek	CO	80815		
58.	Aug-96	Double Eagle Hotel & Casino	CO	80817		
59.	Oct-96	Grand Victoria Casino & Resort	IN	47040	57	138
60.	Oct-96	Flamingo Casino	MO	64120		
61.	Dec-96	Argosy Casino	IN	47025	3	1
	Total				1,769	2,232

Table 2: Summary Statistics: Investor Demographic and Portfolio Characteristics

This table contains summary statistics for the main data samples used. Panel A shows the demographic, gambling, and an abridged set of portfolio characteristics of the respondents in the MTurk survey sample. All respondents are in the U.S., at least 18 years of age, and have financial investments. Panel B shows summary investor demographic and portfolio characteristics for the full sample of investors from a large U.S. discount brokerage (see Barber and Odean (2000) for details). Panel C shows the same information for the 50-mile subsample of investors. The survey sample was collected in October and November 2012. The sample period for the brokerage account data is from January 1991 to November 1996. Male, Married, Retired, and Children are indicator variables equal to one if the investor is male, married, retired, or has at least one child, respectively. Income is the investor's annual income. Portfolio characteristics in Panels B and C are defined as follows. Portfolio size is the average monthly value of stocks in all of an investor's brokerage accounts. Ex ante weighted portfolio beta is the monthly value-weighted average of CAPM betas of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months. Ex ante weighted stock volatility is the monthly value-weighted average of the volatility of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months. Ex ante portfolio volatility is the standard deviation of the portfolio returns over the preceding 36 months. Sharpe ratio, $(E[r_j]-r_f)/\sigma_j$, is constructed for each household using ex ante portfolio volatility as the denominator and an ex ante measure of portfolio performance also constructed from the monthly performance of stocks in each investor's portfolio over the preceding 36 months. Monthly turnover is the average monthly portfolio turnover for each investor, calculated as the average of an investor's monthly sales turnover and purchase turnover. Gross return is the average monthly portfolio return realized by each investor. Net return is the gross portfolio return net of transaction costs Barber and Odean (2000). Market-adjusted gross return is the gross return minus the monthly value-weighted market return. Market-adjusted net return is the net return minus the monthly value-weighted market return. All portfolio characteristic measures are mean monthly averages for each investor.

			Percentile					
	Mean	Std Dev	10th	25th	50th	75th	90th	N
Panel A: Survey Sample								
Investor Demographics								
Age	33.44	10.84	22	25	31	39	50	1,750
Male	0.526	0.499	0	0	1	1	1	1,750
Married	0.417	0.493	0	0	0	1	1	1,750
Retired	0.018	0.132	0	0	0	0	0	1,750
Children	0.391	0.488	0	0	0	1	1	1,750
Income	$61,929	$40,936	$10,000	$30,000	$50,000	$80,000	$125,000	1,750
Gambling Characteristics								
Currently gambles	0.435	0.496	0	0	0	1	1	1,750
Currently gambles outside of lotteries	0.378	0.485	0	0	0	1	1	1,750
Panel B: Full Brokerage Sample								
Investor Demographics								
Age	52.352	13.009	39.5	39.5	49.5	59.5	69.5	32,556
Male	0.881	0.324	0	1	1	1	1	34,872
Married	0.734	0.442	0	0	1	1	1	30,871
Retired	0.168	0.374	0	0	0	0	1	19,143
Children	0.248	0.432	0	0	0	0	1	40,097
Income	$77,340	$38,352	$25,000	$45,000	$62,500	$112,500	$150,000	34,992
Portfolio Characteristics								
Portfolio size	$33,559	$177,934	$2,538	$5,562	$11,975	$27,312	$64,921	62,531
Ex ante weighted portfolio beta (CAPM)	1.107	0.818	0.593	0.854	1.106	1.374	1.673	62,496
Ex ante weighted stock volatility	0.030	0.017	0.016	0.020	0.027	0.035	0.047	62,531
Ex ante portfolio volatility	0.100	0.086	0.048	0.062	0.083	0.118	0.163	62,519
Ex ante Sharpe ratio	0.150	0.268	-0.034	0.052	0.147	0.239	0.328	62,519
Monthly turnover	6.78%	19.49%	0.00%	0.87%	2.94%	7.22%	16.04%	62,531
Gross returns	1.62%	5.37%	-0.57%	0.62%	1.39%	2.36%	3.88%	62,531
Net returns	1.27%	5.85%	-0.95%	0.40%	1.23%	2.14%	3.53%	62,531
Market-adjusted gross returns	0.27%	5.30%	-1.86%	-0.67%	0.09%	1.03%	2.49%	62,531
Market-adjusted net returns	-0.08%	5.80%	-2.28%	-0.89%	-0.07%	0.81%	2.15%	62,531
Panel C: Brokerage Sample Near Casinos								
Investor Demographics								
Age	52.52	12.57	39.5	39.5	49.5	59.5	69.5	1,769
Male	0.930	0.255	1	1	1	1	1	1,769
Married	0.804	0.397	0	1	1	1	1	1,769
Retired	0.129	0.335	0	0	0	0	1	1,769
Children	0.401	0.490	0	0	0	1	1	1,769
Income	$77,627	$37,654	$35,000	$45,000	$62,500	$112,500	$150,000	1,769
Portfolio Characteristics								
Portfolio size	$28,232	$57,565	$2,968	$5,951	$12,450	$26,701	$61,057	1,769
Ex ante weighted portfolio beta (CAPM)	1.069	0.382	0.633	0.849	1.059	1.284	1.528	1,769
Ex ante weighted stock volatility	0.028	0.012	0.016	0.020	0.026	0.034	0.044	1,769
Ex ante portfolio volatility	0.091	0.055	0.048	0.058	0.074	0.106	0.150	1,769
Ex ante Sharpe ratio	0.161	0.188	-0.017	0.064	0.158	0.246	0.330	1,769
Monthly turnover	4.54%	10.19%	0.00%	0.61%	2.08%	4.82%	11.00%	1,769
Gross returns	1.32%	2.21%	-0.16%	0.70%	1.31%	1.96%	2.97%	1,769
Net returns	1.12%	2.33%	-0.46%	0.55%	1.18%	1.81%	2.79%	1,769
Market-adjusted gross returns	0.01%	2.19%	-1.47%	-0.63%	0.01%	0.65%	1.62%	1,769
Market-adjusted net returns	-0.19%	2.31%	-1.76%	-0.76%	-0.13%	0.49%	1.39%	1,769

Table 3: Survey Sample Summary Statistics: Comparing Gamblers to Non-Gamblers

This table compares the mean demographic characteristics of gamblers versus non-gamblers in the survey sample. Panel A shows mean characteristics for survey respondents who currently gamble versus those who do not. Panel B shows mean characteristics for survey respondents who currently gamble outside of lotteries versus those who do not. The right-most column shows t-tests of the difference between the characteristics of gamblers versus non-gamblers. Variables are as defined in Table 2.

Panel A: Gambling Behavior

	Does Not Currently Gambles	Currently Gambles	Difference
Age	32.074	35.206	-3.132***
			(-6.05)
Male	0.509	0.548	-0.039
			(-1.64)
Married	0.393	0.447	-0.053**
			(-2.25)
Retired	0.011	0.026	-0.015**
			(-2.26)
Children	0.373	0.414	-0.041*
			(-1.74)
Income	$58,327	$66,610	-8,283***
			(-4.22)
Number of Observations	989	761	

Panel B: Gambling Behavior Outside of Lotteries

	Does Not Currently Gambles Outside of Lotteries	Currently Gambles Outside of Lotteries	Difference
Age	32.563	34.874	-2.312***
			(-4.35)
Male	0.511	0.549	-0.038
			(-1.53)
Married	0.406	0.434	-0.028
			(-1.16)
Retired	0.014	0.024	-0.010
			(-1.50)
Children	0.379	0.410	-0.031
			(-1.28)
Income	$58,407	$67,731	-$9,324***
			(-4.65)
Number of Observations	1,089	661	

Table 4: Cross-Sectional Logit Regression Using Survey Data: Predicting the Likelihood of Gambling Participation

This table contains the coefficient estimates of individual-level cross-sectional logit regressions using survey data collected from Amazon Mechanical Turk. The dependent variable in column (1) equals one if the respondent indicated that they currently participates in some form of gambling, and equals zero otherwise. In column (2), the dependent variable equals one if the respondent currently gambles, excluding participation in lotteries. Male, Married, Child, and Retired are indicator variables that equal one if the respondent is male, married, has at least one child, or is currently retired, respectively. Age is the respondent's age expressed in 10 year increments (Age/10) and income is the respondent's household income in tens of thousands ($10,000s) for ease of readability. The squared and cubed values of age and income are also included as explanatory variables. State fixed effects are also included in the specification, but estimates are not shown for brevity.

Independent Variable	Currently Gambles (1)	Currently Gambles Outside of Lotteries (2)
Intercept	6.4904***	5.1206***
	(3.66)	(2.81)
Male	0.2442**	0.2071*
	(2.27)	(1.88)
Married	-0.0861	-0.2348*
	(-0.63)	(-1.68)
Child	-0.1505	-0.0714
	(-1.11)	(-0.51)
Retired	0.5573	0.3910
	(1.28)	(0.86)
Age	2.1662*	3.4499***
	(1.87)	(2.85)
Age^2	-0.3791	-0.7192**
	(-1.30)	(-2.36)
Age^3	0.0219	0.0484**
	(0.94)	(1.98)
Income	0.3687***	0.3747***
	(4.09)	(4.06)
$Income^2$	-0.0300***	-0.0288***
	(-3.14)	(-2.94)
$Income^3$	0.0007**	0.0006**
	(2.56)	(2.36)
State Fixed Effects	Yes	Yes
Adjusted R^2	0.0965	0.0963
Number of Respondents	1,750	1,750

Table 5: Brokerage Sample Summary Statistics: Comparing Gamblers to Non-Gamblers

This table contains mean summary statistics for the 50-mile subsample of investors in the brokerage data set, sorted into quintiles based on their estimated propensity to gamble outside of lotteries. Panel A contains investor demographics and Panel B contains the pre-treatment portfolio characteristics to compare the investor portfolios of likely versus unlikely gamblers before the opening of the casino. The right-most column shows t-tests of the difference between the characteristics of unlikely gamblers in the lowest quintile of gambling propensity and of likely gamblers in the highest quintile of gambling propensity Variables are as defined in Table 2.

	Quintiles Sorted Gambling Propensity Ouside of Lotteries					
	Low	2	3	4	High	Low–High
Panel A: Investor Demographics						
Propensity to gamble outside of lotteries	0.320	0.442	0.550	0.629	0.702	-0.381***
						(-97.67)
Age	51.142	50.545	53.241	51.765	55.357	-4.215***
						(-4.30)
Male	0.925	0.907	0.917	0.929	0.965	-0.039**
						(-2.22)
Married	0.824	0.806	0.779	0.876	0.739	0.086***
						(2.70)
Retired	0.091	0.099	0.124	0.066	0.251	-0.160***
						(-5.85)
Children	0.453	0.414	0.376	0.482	0.289	0.163***
						(4.53)
Income	$65,831	$73,974	$72,349	$86,029	$86,041	-$20,210***
						(-6.85)
Number of Observations	472	464	470	468	466	
Panel B: Pre-Treatment Portfolio Characteristics						
Portfolio size	$18,920	$22,459	$23,091	$20,655	$24,343	-$5,422
						(-1.44)
Monthly turnover	7.72%	5.49%	7.78%	5.95%	6.77%	0.96%
						(0.86)
Ex ante portfolio beta (CAPM)	1.119	1.099	1.127	1.070	1.116	0.003
						(0.09)
Ex ante weighted stock volatility	0.033	0.033	0.034	0.033	0.032	0.001
						(0.82)
Ex ante portfolio volatility	0.094	0.092	0.093	0.092	0.095	-0.001
						(-0.23)
Ex ante Sharpe ratio	0.172	0.151	0.152	0.174	0.146	0.026**
						(2.04)
Gross returns	2.370%	2.091%	2.126%	1.603%	1.900%	0.500%
						(1.38)
Net returns	2.023%	1.839%	1.761%	1.375%	1.583%	0.441%
						(1.32)
Market-adjusted gross returns	0.921%	0.513%	0.588%	0.179%	0.452%	0.469%
						(1.45)
Market-adjusted net returns	0.574%	0.262%	0.223%	-0.049%	0.135%	0.439%
						(1.36)
Number of Observations	472	464	470	468	466	

Table 6: Panel Difference-in-Differences Regression: Effect of Casino Openings on Portfolio Risk Taking

This table contains estimates from fixed effect panel regressions using the 50-mile subsample. In each panel, a measure of portfolio risk is regressed on the interaction between a measure of gambling propensity and an indicator that equals one for all months after the casino near each investor has opened. In Panel A, the dependent variable is ex ante weighted portfolio beta, which is the monthly value-weighted average of CAPM betas of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months. The dependent variable in Panel B is the ex ante weighted stock volatility, a monthly value-weighted average of the volatility of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months. Panel C shows regressions using ex ante portfolio volatility, the standard deviation of the monthly returns on the portfolio in month t over the preceding 36 months, as the dependent variable. $AfterCasino$ is an indicator that equals one if the casino near investor i has opened by month t. In column (1), $PropGambleScore$ is a variable indicating the propensity to gamble for each investor i. In columns (2) and (3), $HighPropGambleQuintile$ and $HighPropGambleTercile$ are indicator variables that equals one for investors who are in the top quintile and tercile, respectively, sorted based on the propensity to gamble score used in column (1). The samples used in columns (2) and (3) include only those investors in the top and bottom quintiles and terciles, respectively, for ease of interpretation. The measures of gambling propensity used in columns (4) to (6) are analogous to those in columns (1) to (3), but use a measure indicating an investor's propensity to gamble excluding lotteries. All regressions include household and month fixed effects, as well as controls for portfolio size and the number of stocks in each investor's portfolio. Portfolio size is expressed in millions for ease of readability. Standard errors are clustered by household. T-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% significance levels, respectively.

Panel A: Effect of Casino Openings on Ex ante Weighted Portfolio Beta (CAPM)

	Dependent Variable: Ex ante Weighted Portfolio Beta (CAPM)					
	(1)	(2)	(3)	(4)	(5)	(6)
PropGamble Score × After Casino	0.0381					
	(1.40)					
High PropGamble Quintile × After Casino		0.0527*				
		(1.67)				
High PropGamble Tercile × After Casino			0.0512*			
			(1.94)			
NonLottPropGamble Score × After Casino				0.0477		
				(1.54)		
High NonLottPropGamble Quintile × After Casino					0.0808**	
					(2.29)	
High NonLottPropGamble Tercile × After Casino						0.0533**
						(2.05)
Portfolio Size	0.1354	0.2213	0.2581	0.1354	0.2581	0.1570
	(0.42)	(0.43)	(0.58)	(0.42)	(0.44)	(0.35)
Number of Stocks	0.0019	-0.0064	-0.0004	0.0019	-0.0030	-0.0004
	(0.44)	(-0.72)	(-0.06)	(0.44)	(-0.29)	(-0.06)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.246	0.256	0.237	0.246	0.204	0.231
Number of Households	1,769	698	1,194	1,769	701	1,180
Number of Observations	85,924	33,707	57,400	85,924	33,793	57,247

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Table 6 Panel Difference-in-Differences Regression: Effect of Casino Openings on Portfolio Risk Taking – *Continued from previous page*

Panel B: Effect of Casino Openings on Ex ante Weighted Stock Volatility

	Dependent Variable: Ex ante Weighted Stock Volatility					
	(1)	(2)	(3)	(4)	(5)	(6)
PropGamble Score × After Casino	0.0019**					
	(2.18)					
High PropGamble Quintile × After Casino		0.0019*				
		(1.92)				
High PropGamble Tercile × After Casino			0.0017*			
			(1.95)			
NonLottPropGamble Score × After Casino				0.0023**		
				(2.29)		
High NonLottPropGamble Quintile × After Casino					0.0029***	
					(2.59)	
High NonLottPropGamble Tercile × After Casino						0.0025***
						(3.05)
Portfolio Size	-0.0045	-0.0078	-0.0061	-0.0045	-0.0113	-0.0098
	(-0.62)	(-0.70)	(-0.63)	(-0.62)	(-0.91)	(-1.02)
Number of Stocks	-0.0001	-0.0002	-0.0001	-0.0001	0.0001	-0.0001
	(-0.91)	(-0.80)	(-0.66)	(-0.91)	(0.28)	(-0.58)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.530	0.554	0.517	0.530	0.474	0.512
Number of Households	1,769	698	1,194	1,769	701	1,180
Number of Observations	86,043	33,762	57,492	86,043	33,841	57,342

Panel C: Effect of Casino Openings on Ex ante Portfolio Volatility

	Dependent Variable: Ex ante Portfolio Volatility					
	(1)	(2)	(3)	(4)	(5)	(6)
PropGamble Score × After Casino	0.0036					
	(1.59)					
High PropGamble Quintile × After Casino		0.0062**				
		(2.12)				
High PropGamble Tercile × After Casino			0.0050**			
			(2.29)			
NonLottPropGamble Score × After Casino				0.0043*		
				(1.66)		
High NonLottPropGamble Quintile × After Casino					0.0079***	
					(2.59)	
High NonLottPropGamble Tercile × After Casino						0.0032
						(1.47)
Portfolio Size	-0.0740	-0.0817	-0.0893	-0.0740	-0.1268	-0.1036
	(-1.54)	(-1.08)	(-1.37)	(-1.54)	(-1.49)	(-1.57)
Number of Stocks	-0.0023***	-0.0034**	-0.0026**	-0.0023***	-0.0023	-0.0026**
	(-2.68)	(-2.54)	(-2.11)	(-2.68)	(-1.10)	(-2.10)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.313	0.336	0.272	0.313	0.204	0.259
Number of Households	1,769	698	1,194	1,769	701	1,180
Number of Observations	85,964	33,726	57,428	85,964	33,810	57,279

Table 7: Panel Difference-in-Differences Regression: Effect of Demographic Characteristics on Portfolio Risk Taking

This table contains estimates from fixed effect panel regressions using the 50-mile subsample. The dependent variable is ex ante weighted portfolio beta, the monthly value-weighted average of CAPM betas of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months. $HighNonLottPropGambleQuintile$ is an indicator that equals one for investors in the highest quintile sorted on their propensity to gamble outside of lotteries score and equals zero for investors in the lowest quintile. $AfterCasino$ is an indicator that equals one if the casino near investor i has opened by month t. Each demographic characteristics is interacted with either $AfterCasino$ or both $HighNonLottPropGambleQuintile$ and $AfterCasino$. All regressions include household and month fixed effects, as well as controls for portfolio size and the number of stocks in each investor's portfolio. Portfolio size is expressed in millions for ease of readability. Standard errors are clustered by household. T-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% significance levels, respectively.

Panel A: Effect of Demographic Characteristics on Ex ante Weighted Portfolio Beta (CAPM)

	Dependent Variable: Ex ante Weighted Portfolio Beta (CAPM)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High NonLottPropGamble Quintile × After Casino	0.1077**						
	(2.48)						
Age × After Casino	-0.0036***	-0.0007					
	(-2.67)	(-1.24)					
Children × After Casino	-0.0432		-0.0182				
	(-0.96)		(-0.42)				
Income × After Casino	-0.0003			-0.0004			
	(-0.61)			(-1.10)			
Male × After Casino	0.0823				-0.0126		
	(1.07)				(-0.37)		
Married × After Casino	0.1334**					0.0212	
	(2.55)					(0.65)	
Retired × After Casino	0.0899*						0.0648
	(1.84)						(1.16)
Age × High NonLottPropGamble Quintile × After Casino		0.0016**					
		(2.26)					
Children × High NonLottPropGamble Quintile × After Casino			0.0297				
			(0.54)				
Income × High NonLottPropGamble Quintile × After Casino				0.0013**			
				(2.56)			
Male × High NonLottPropGamble Quintile × After Casino					0.0898**		
					(2.11)		
Married × High NonLottPropGamble Quintile × After Casino						0.0848*	
						(1.86)	
Retired × High NonLottPropGamble Quintile × After Casino							0.0135
							(0.18)
Portfolio Size	0.2325	0.2494	0.2666	0.2607	0.2536	0.2564	0.2551
	(0.40)	(0.43)	(0.46)	(0.45)	(0.44)	(0.44)	(0.43)
Number of Stocks	-0.0026	-0.0030	-0.0026	-0.0031	-0.0029	-0.0032	-0.0032
	(-0.25)	(-0.29)	(-0.25)	(-0.30)	(-0.28)	(-0.31)	(-0.30)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.206	0.204	0.204	0.205	0.204	0.205	0.204
Number of Households	701	701	701	701	701	701	701
Number of Observations	33,793	33,793	33,793	33,793	33,793	33,793	33,793

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Panel B: Effect of Demographic Characteristics on Ex ante Weighted Stock Volatility							
	Dependent Variable: Ex ante Weighted Stock Volatility						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High NonLottPropGamble Quintile × After Casino	0.0035**						
	(2.42)						
Age × After Casino	-0.0000	-0.0000					
	(-0.15)	(-0.44)					
Children × After Casino	0.0000		-0.0006				
	(0.02)		(-0.45)				
Income × After Casino	-0.0000			-0.0000			
	(-0.76)			(-1.30)			
Male × After Casino	0.0001				-0.0007		
	(0.04)				(-0.63)		
Married × After Casino	0.0010					-0.0009	
	(0.63)					(-0.77)	
Retired × After Casino	-0.0004						0.0020
	(-0.23)						(0.82)
Age × High NonLottPropGamble Quintile × After Casino		0.0001**					
		(2.28)					
Children × High NonLottPropGamble Quintile × After Casino			0.0020				
			(0.98)				
Income × High NonLottPropGamble Quintile × After Casino				0.0000***			
				(3.01)			
Male × High NonLottPropGamble Quintile × After Casino					0.0036***		
					(2.74)		
Married × High NonLottPropGamble Quintile × After Casino						0.0037***	
						(2.81)	
Retired × High NonLottPropGamble Quintile × After Casino							-0.0014
							(-0.49)
Portfolio Size	-0.0114	-0.0115	-0.0108	-0.0112	-0.0115	-0.0115	-0.0110
	(-0.91)	(-0.92)	(-0.86)	(-0.91)	(-0.93)	(-0.91)	(-0.87)
Number of Stocks	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.33)	(0.26)	(0.34)	(0.28)	(0.30)	(0.27)	(0.33)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.474	0.474	0.473	0.475	0.475	0.474	0.473
Number of Households	701	701	701	701	701	701	701
Number of Observations	33,841	33,841	33,841	33,841	33,841	33,841	33,841

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Panel C: Effect of Demographic Characteristics on Ex ante Portfolio Volatility							
	Dependent Variable: Ex ante Portfolio Volatility						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High NonLottPropGamble Quintile × After Casino	0.0079**						
	(2.15)						
Age × After Casino	-0.0002**	-0.0000					
	(-1.99)	(-0.12)					
Children × After Casino	-0.0022		-0.0021				
	(-0.65)		(-0.56)				
Income × After Casino	-0.0000			-0.0000			
	(-0.33)			(-0.71)			
Male × After Casino	0.0060				0.0003		
	(0.92)				(0.11)		
Married × After Casino	0.0091**					0.0025	
	(2.28)					(0.83)	
Retired × After Casino	0.0121*						0.0103
	(1.69)						(1.44)
Age × High NonLottPropGamble Quintile × After Casino		0.0001**					
		(1.99)					
Children × High NonLottPropGamble Quintile × After Casino			0.0055				
			(1.06)				
Income × High NonLottPropGamble Quintile × After Casino				0.0001**			
				(2.52)			
Male × High NonLottPropGamble Quintile × After Casino					0.0085**		
					(2.37)		
Married × High NonLottPropGamble Quintile × After Casino						0.0077*	
						(1.93)	
Retired × High NonLottPropGamble Quintile × After Casino							0.0017
							(0.17)
Portfolio Size	-0.1290	-0.1273	-0.1257	-0.1264	-0.1271	-0.1269	-0.1278
	(-1.53)	(-1.50)	(-1.48)	(-1.48)	(-1.49)	(-1.51)	(-1.52)
Number of Stocks	-0.0023	-0.0023	-0.0022	-0.0023	-0.0023	-0.0023	-0.0023
	(-1.10)	(-1.11)	(-1.08)	(-1.10)	(-1.10)	(-1.11)	(-1.11)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.205	0.204	0.204	0.205	0.205	0.205	0.205
Number of Households	701	701	701	701	701	701	701
Number of Observations	33,810	33,810	33,810	33,810	33,810	33,810	33,810

Table 8: Panel Difference-in-Differences Regression: 100-Mile Radius Subsample

This table contains estimates from fixed effect panel regressions using the 100-mile subsample. The dependent variable is ex ante weighted portfolio beta in columns (1) to (3), ex ante weighted stock volatility in columns (4) to (6), and ex ante portfolio volatility in columns (7) to (9). Ex ante weighted portfolio beta is the monthly value-weighted average of CAPM betas of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months, ex ante weighted stock volatility is defined as the monthly value-weighted average of the volatility of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months, and ex ante portfolio volatility is the standard deviation of the monthly returns on the portfolio in month t over the preceding 36 months, as the dependent variable. The explanatory variables of interest are an interaction between a measure of gambling propensity and $AfterCasino$, an indicator that equals one for all months after the casino near each investor has opened. In column (1), $NonLottPropGambleScore$ is a variable indicating the propensity to gamble outside of lotteries for each investor i. In columns (2) and (3), $HighNonLottPropGambleQuintile$ and $HighNonLottPropGambleTercile$ are indicator variables that equals one for investors who are in the top quintile and tercile, respectively, sorted based on the propensity to gamble score used in column (1). The samples used in columns (2) and (3) include only those investors in the top and bottom quintiles and terciles, respectively, for ease of interpretation. All regressions include household and month fixed effects, as well as controls for portfolio size and the number of stocks in each investor's portfolio. Portfolio size is expressed in millions for ease of readability. Standard errors are clustered by household. T-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% significance levels, respectively.

Dependent Variable:	Ex ante Weighted Portfolio Beta (CAPM)			Ex ante Weighted Stock Volatility			Ex ante Portfolio Volatility		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
NonLottPropGamble Score × After Casino	0.0232			0.0020**			0.0030		
	(0.83)			(2.14)			(1.24)		
High NonLottPropGamble Quintile × After Casino		0.0509			0.0024**			0.0061**	
		(1.61)			(2.42)			(2.17)	
High NonLottPropGamble Tercile × After Casino			0.0329			0.0023***			0.0035*
			(1.39)			(3.01)			(1.78)
Portfolio Size	-0.0279	0.3300	-0.0549	-0.0006	-0.0008	-0.0013	-0.0267	-0.0910	-0.0269
	(-0.19)	(0.69)	(-0.33)	(-0.18)	(-0.06)	(-0.38)	(-1.19)	(-1.33)	(-1.02)
Number of Stocks	0.0008	-0.0045	0.0019	-0.0002**	-0.0002	-0.0002**	-0.0026***	-0.0022	-0.0033***
	(0.27)	(-0.56)	(0.46)	(-2.47)	(-1.13)	(-2.06)	(-4.26)	(-1.47)	(-4.12)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.248	0.217	0.242	0.381	0.497	0.523	0.280	0.241	0.290
Number of Households	2,232	951	1,536	2,232	951	1,536	2,232	951	1,536
Number of Observations	108,098	44,957	73,370	108,238	45,034	73,489	108,143	44,985	73,408

Table 9: Panel Difference-in-Differences Regression: Dynamic Treatment Effects

This table contains estimates from fixed effect panel regressions to examine the dynamics of risk taking surrounding the casino opening using the 50-mile subsample. The dependent variable is ex ante weighted portfolio beta in columns (1) to (3), ex ante weighted stock volatility in columns (4) to (6), and ex ante portfolio volatility in columns (7) to (9). Ex ante weighted portfolio beta is the monthly value-weighted average of CAPM betas of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months, ex ante weighted stock volatility is defined as the monthly value-weighted average of the volatility of each stock in the investor's portfolio estimated using monthly data over the preceding 36 months, and ex ante portfolio volatility is the standard deviation of the monthly returns on the portfolio in month t over the preceding 36 months, as the dependent variable. The explanatory variables of interest are an interaction between a dummy indicating investors most likely to gamble relative to those least likely to gamble and an dummy indicating the year(s) surrounding the casino opening. $HighNonLottPropGambleQuintile$ is an indicator that equals one for investors in the highest quintile sorted on their propensity to gamble outside of lotteries score and equals zero for investors in the lowest quintile. $AfterTrmt_{it}^{s}$ is an indicator variable that equals one for the s^{th} year after the casino opening and $AfterTrmt_{it}^{>s}$ is an indicator that equals one if the casino opened strictly more than s years ago. For years prior to the casino opening, $AfterTrmt_{it}^{-1}$ is an indicator that equals one for the year before the casino opened and $AfterTrmt_{it}^{-2}$ is an indicator the equals one for the year two years prior to the casino opened. All regressions include household and month fixed effects, as well as controls for portfolio size and the number of stocks in each investor's portfolio. Portfolio size is expressed in millions for ease of readability. Standard errors are clustered by household. T-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% significance levels, respectively.

Dependent Variable:	Ex ante Weighted Portfolio Beta (CAPM)			Ex ante Weighted Stock Volatility			Ex ante Portfolio Volatility		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High NonLottPropGamble Quintile × After Casino^{-2}	0.0882	0.0869	0.0899	0.0011	0.0012	0.0012	0.0036	0.0033	0.0033
	(1.09)	(1.07)	(1.11)	(0.54)	(0.61)	(0.61)	(0.62)	(0.55)	(0.55)
High NonLottPropGamble Quintile × After Casino^{-1}	0.1262	0.1250	0.1282	0.0018	0.0019	0.0019	0.0035	0.0032	0.0032
	(1.39)	(1.37)	(1.41)	(0.68)	(0.73)	(0.73)	(0.44)	(0.40)	(0.40)
High NonLottPropGamble Quintile × After Casino$^{>0}$	0.2000**			0.0045			0.0115		
	(2.14)			(1.57)			(1.38)		
High NonLottPropGamble Quintile × After Casino^{1}		0.2030**	0.2052**		0.0042	0.0042		0.0123	0.0124
		(2.14)	(2.16)		(1.47)	(1.47)		(1.40)	(1.40)
High NonLottPropGamble Quintile × After Casino$^{>1}$		0.1945**			0.0051*			0.0099	
		(2.00)			(1.66)			(1.15)	
High NonLottPropGamble Quintile × After Casino^{2}			0.1823*			0.0051*			0.0097
			(1.87)			(1.68)			(1.11)
High NonLottPropGamble Quintile × After Casino$^{>2}$			0.2120**			0.0051			0.0101
			(2.09)			(1.61)			(1.12)
Portfolio Size	0.2553	0.2565	0.2513	-0.0113	-0.0114	-0.0114	-0.1269	-0.1265	-0.1266
	(0.44)	(0.44)	(0.43)	(-0.91)	(-0.93)	(-0.93)	(-1.49)	(-1.49)	(-1.49)
Number of Stocks	-0.0032	-0.0032	-0.0031	0.0001	0.0001	0.0001	-0.0023	-0.0023	-0.0023
	(-0.31)	(-0.31)	(-0.30)	(0.27)	(0.27)	(0.27)	(-1.10)	(-1.10)	(-1.10)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.204	0.204	0.205	0.474	0.474	0.474	0.204	0.204	0.204
Number of Households	701	701	701	701	701	701	701	701	701
Number of Observations	33,793	33,793	33,793	33,841	33,841	33,841	33,810	33,810	33,810

Table 10: Panel Difference-in-Differences Regression: Effect of Casino Openings on Portfolio Performance

This table contains estimates from fixed effect panel regressions using the 50-mile subsample. The dependent variable in columns (1) to (3) is the portfolio returns net of transaction costs and the dependent variable used in columns (4) to (6) is the ex ante Sharpe ratio. Sharpe ratio, $(E[r_j] - r_f)/\sigma_j$, is constructed from the monthly performance of stocks in each investor's portfolio over the preceding 36 months. The explanatory variables of interest are an interaction between a measure of gambling propensity and $AfterCasino$, an indicator that equals one for all months after the casino near each investor has opened. In column (1), $NonLottPropGambleScore$ is a variable indicating the propensity to gamble outside of lotteries for each investor i. In columns (2) and (3), $HighNonLottPropGambleQuintile$ and $HighNonLottPropGambleTercile$ are indicator variables that equals one for investors who are in the top quintile and tercile, respectively, sorted based on the propensity to gamble score used in column (1). The samples used in columns (2) and (3) include only those investors in the top and bottom quintiles and terciles, respectively, for ease of interpretation. All regressions include household and month fixed effects, as well as controls for portfolio size and the number of stocks in each investor's portfolio. Portfolio size is expressed in millions for ease of readability. Standard errors are clustered by household. T-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% significance levels, respectively.

Dependent Variable:	Realized Net Returns			Ex Ante Sharpe Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
NonLottPropGamble Score × After Casino	0.0029			-0.0060		
	(1.22)			(-0.59)		
High NonLottPropGamble Quintile × After Casino		0.0065**			0.0083	
		(2.38)			(0.73)	
High NonLottPropGamble Tercile × After Casino			0.0053***			0.0004
			(2.77)			(0.04)
Portfolio Size	-0.0140	0.0072	-0.0058	0.4790***	0.3748***	0.4829***
	(-0.95)	(0.30)	(-0.30)	(5.20)	(3.42)	(4.34)
Number of Stocks	-0.0003	-0.0013	-0.0006	0.0078***	0.0113***	0.0093***
	(-0.69)	(-1.05)	(-0.91)	(4.63)	(5.30)	(4.89)
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.106	0.098	0.102	0.409	0.472	0.474
Number of Households	1,769	701	1,180	1,769	701	1,180
Number of Observations	86,044	33,841	57,343	85,963	33,810	57,279