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Gambling with Momentum: How Gambling Cultures Shape Financial Markets

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GAMBLING WITH MOMENTUM:

HOW GAMBLING CULTURES SHAPE FINANCIAL MARKETS

by

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ABSTRACT

Gambling with Momentum:

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by

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Do people who gamble carry such preferences into their investments? This study looks at various factors which are used to identify countries with a significant gambling population, and seeks to find a relationship with those gambling tendencies and premiums associated with momentum. From historical market data from financial markets in 45 different countries I found stronger evidence of a momentum premium in those countries which have those identifying factors for gambling, than those that do not. Results of the regression analysis suggest weak evidence that it is possible that the momentum premium could be associated with gambling preferences and culture due to the hot hand fallacy. Meaning, when gamblers see a stock get hot they will double down, believing they exercise an illusion of control that the stock they invest in will continue to have positive returns.

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My personal thanks to my dear friends Dr. Ben Blau, the man who shared with me an incredible passion for research which helped me find my current path in life. And, to Dr. Tyler Brough who helped me stay on that path.

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1. INTRODUCTION

Why do people gamble? Gambling is, simply put, trying to get a large payoff from playing a game of chance. Generally speaking, gamblers take on a great amount of risk according to expected utility theory. For instance, expected utility theory assumes that risk averse individuals will exhibit a concave utility function over wealth – whereas gamblers will likely exhibit a convex utility function, meaning that gamblers obtain utility from playing games of chance instead of taking the certainty equivalent from the gamble. Some have argued that gamblers have preferences for positive skewness instead of risk (Golec and Tamarkin (1998) and Garrett and Sobel (1999)). However, others suggest that gamblers believe they are luckier than the average participant this is referred to as the gamblers fallacy (Ayton, Fischer (2004)) which suggests the following. After flipping a coin 10 times in a row and seeing 10 consecutive heads, the individuals might assume that the probability of observing tails on the 11^{th} flip is higher than .50. In the framework of the momentum premium – to the extent that price movements are random, observing a stock that has increased in consecutive periods might cause investors to overstate the probability of that the stock will decrease in the upcoming period. Therefore, they demand these stocks less, prices are lower than they otherwise would be, and returns become higher. Conversely, they may prescribe to having a 'hot hand', 'hot streak', or playing when the game is 'hot'. This sort of 'hot hand' behavior could be due to the overweighing of the tails in an outcome distribution. For instance, a gambler might believe the probability of observing an extreme positive outcome is higher than it is. Some believe that the stock market is a glorified casino with investments representing games of chance. Barberis and Huang (2008) show that investors

who place a higher probability to events occurring in the tails of a distribution, which leads to a higher demand for positively skewed securities that mirror the games found in casinos. Markets naturally incorporate methodology as the price of securities goes up during peak seasons of demand. Do investors treat the trading floor as they do the casino floor? There is literature to suggest, Zhang (2005), Kumar (2009), Boyer, Mitton, and Vorkink (2010), Bali, Cakici, and Whitelaw (2011), that gamblers prefer these casino return distributions in their respective financial markets.

When a participant in a casino has several consecutive wins, or positive returns, they are said to have the 'hot hand'. The hotter a stock becomes in the market the excitement builds with investors who gamble, two months of positive returns will bring more investors, as will three and four. This belief, in the minds of the participants, overrides the actual probability of events as they assign a subjectively higher probability to the payoff or positively skewed event. In a popular psychology study, Gilovich, Vallone, and Tversky (1985) find that individuals are prone to abandon or ignore statistical data and probability when a favorable event occurs several times in succession or, in the case of financial markets continual positive returns. This paper uses proxy variables to identify foreign countries with cultures and laws that are favorable towards gambling. Such countries where gambling is permitted or even favorable might have a positive correlation with skewness preferences (Kumar (2009)). Blau, Hsu, and Whitby (2016) show that this is the case. As a societal norm, people could incorporate this way of thinking into many aspects of their life, namely their investment strategies and preferences for securities. Furthermore, as these investors see a 'hot stock' they could , flock for the chance to throw their money in and ride the positive returns as long as possible. However, for certain individuals their desire for skewness could

be slaked by their indulgence in conventional gambling, in which case they would not carry those practices over to securities, as documented by Cookson (2015). Do individuals carry their 'hot hand' from the tables to the trading desks? Or do quell their appetite for skewness and lottery-like payoffs while looking for their next lucky streak or momentum stock while analyzing financial markets? Answers to such questions are the exact premise of this paper. Whether it is hot hands or the gamblers fallacy, as stated above, that drive the momentum premium, it doesn't matter. Gambling cultures could be a key piece to the explanation, in part, of the momentum premium.

In other research, Jegadeesh and Titman (1993, 2001) show a positive and significant momentum premium, which is a premium for stocks that have outperformed in the previous six-month period or one-year period (Famma, French (2012), Zhang (2006), Lewellen (2002)). Their findings indicate that the returns to a strategy of buying winners and selling losers outperform the market by up to 12% annually. Avramov and Chordia (2008) suggest that momentum is unexplainable by traditional financial analysis and has been left to behavioral models attempting to measure cognitive biases. This paper attempts to display such a model using proxy variables for gambling attitudes in foreign countries. The hot hands affect, as described above, would likely be the underlying factor explaining the weak but positive coefficient estimates for the momentum premium and future returns. I demonstrate that several countries have a positive momentum premium herein, and that those countries typically exhibit gambling tendency's as defined by my selected proxy variables. It is accepted that various countries have differing cultural, religious, and political institutions which induce variation in the level of gambling attitudes. In this study, I use a Fama-MacBeth (1973) approach to test whether the momentum premium across countries is

explained by favorable gambling attitudes. My first observation of note is that over half of the countries included in the study show a positive and significant (six-month) momentum premium. Only one country has a negative and significant coefficient for momentum. To help view gambling sentiments across countries I look at several factors. The first is the top ten countries with the highest number of gambling institutions. The second is the top ten countries for gambling loss per adult. The third is whether or not the government in a respective country has legal online gambling. The fourth factor is the ten countries with the highest catholic-to-protestant ratio (following Kumar, Page, and Spalt (2011)) in countries where Catholics or protestants make up at least 50% of the population as stated above, and throughout the paper, such countries maintain a positive and significant momentum premium.

Results show some evidence that the momentum premium could be associated with gambling culture and the propensity to overestimate the probability of the short-term future events based on a streak or previously perceived pattern. Such a pattern is the momentum premium found specifically in countries where gambling is present. There are significant results showing this premium in gambling countries and weak yet positive evidence that suggest gambling and momentum are associated with positive returns in t+1.

2. DATA DESCRIPTION

The period analyzed in the paper is from 1980 to 2013. I include countries which have samples from the entire period, which includes stock returns for various securities from 45 countries from DataStream and firm-specific data from Worldscope. For each stock, I estimate a local CAPM beta with respect to the local market return based on the capitalization-weighted return for all stocks in our data for a given country. To find the idiosyncratic volatility for each

stock I standard deviation of the residuals from the CAPM regression. Both beta and the idiosyncratic volatility is estimated using a six-month, rolling window. The book-to-market ratio, for a given month, is found by using the book value of equity from the previous fiscal year and the value of equity from the end of the month. Market cap is stocks market capitalization in a particular month. The independent variable of interest is the momentum, which is the six-month prior cumulative stock return.

For a summary of the various statistics for each country and the averages for the entire set we look at Table 1. The range of the number of securities in each country is 69 to nearly 5,000 – Japan having the most securities with 4,998. There are only two other countries with more than 4,000 securities; Canada, and the UK. The average number of securities per country is 960. The average beta is 1.816. The average market capitalization (*Size*) is $1.006 billion. Switzerland has fewer than the average number of securities observed yet a much higher market capitalization than most other countries which would suggest each individual stock, or a small group of large cap stocks greatly influence the market in this regard. The average book-to-market ratio is 3.923. The average idiosyncratic volatility (*IdioVolt*) is 10.143% which is heavily influenced by the very high idiosyncratic volatility of Chile of 255.8%. The average (*IdioVolt)* of the study, without Chile would be 4.56%. Similarly, Chile's past six month return (*Momentum*) is well above normal while those of Canada and Peru are closest to the average.

The data for the top 10 countries with gambling losses per adult were taken from a Manchester based data and consulting company, H2 Gambling Capital. I used standard census data to calculate the Catholic-to-Protestant ratio. Various sources were used as verifications for county-specific legalized online gambling. I reviewed and included all relevant

macroeconomic data from The World Bank namely; GDP per capita, income per capita, and consumption per capita. The specifics for their data and any relevant calculations are available at data.worldbank.org.

3. RESULTS

In table 2, I estimate the following regression using a Fama-MacBeth (1973) framework and include t-statistics from Newey-West (1987) standard errors (with three lags).

$$Ret_{i,t+1,c} = \alpha + \beta_1 Beta_{i,t,c} + \beta_2 Ln(Size_{i,t,c}) + \beta_3 B/M_{i,t,c} + \beta_4 IdioVolt_{i,t,c} + \beta_5 Momentum_{i,t,c} + \varepsilon_{i,t+1,c} \quad (1)$$

The dependent variable for returns for stock *i* in month *t+1* in country *c*. The independent variables include: Beta, the natural log of market cap (Ln(Size)), B/M ratios, IdioVolt, and Momentum. Each of these independent variables are measured in time t. It is important to note the absence of almost any significant results, with respect to *beta.* Not surprisingly, a large market capitalization weights very little on returns in month t+1. Similarly, almost all significant results for (*IdioVolt)* are negative, even so only eight countries have significant results in this regard.

While looking at table 2, almost every country displays positive and significant results with regards to Momentum, which suggests that there is indeed a momentum premium in almost every country within the study. Except for the Philippines there are no negative and significant (*momentum*) results. Conversely, 19 countries have positive momentum results at the 0.01 confidence level with 4 and 3 countries at the 0.05 and 0.1 levels respectively. The Philippines is the only positive and significant result for *(IdioVolt)* which coincides with the aforementioned negative and significant results for

the prior six-month returns, as increased volatility may lead to positive returns in month t+1 the past six-month performance of those volatile stocks would be negative.

Table 3 explores the countries with the highest total gambling losses per adult. By looking at the data in this light I hoped to reveal the extreme case of high gambling losses, which captures the amount of gambling in a particular country, and their impact on the momentum premium. In the top ten countries for gambling losses per adult I find a positive and statistically significant momentum premium at the 0.01 confidence level. When compared to those not top ten countries, I do not find a momentum premium is significant. With the absence of a momentum premium in these countries I find a positive and significant result for *IdioVolt.* Each country carries with it a unique set of laws and cultural practices which introduce a certain level of noise in the study. It is important to note that the magnitude of losses is not known in this study and will vary from country to country. When all observations are regressed, and we add in the variable *HighGambLoss* and its related interaction term *MomentumxHighGambLoss*. There is weak evidence that supports the hypothesis that gambling in countries is correlated with a momentum premium given the coefficient estimate is positive and the t-statistic (1.35) is close to a significant result. As mentioned above, the noise across so many countries due to differing regulations and cultural norms may be key in explaining why there is only weak evidence to support a momentum premium in countries with high gambling losses. However, at a very minimum, my results show that in countries with the highest gambling losses per adult, there exists a significant momentum premium, which is consistent with my hypothesis.

While adults who lose a lot while gambling is only one way of determining the propensity of a society to engage in gambling there are still may other factors to consider when determining whether or not individuals in a country display gambling tendencies. Although the presence of gambling institutions does not capture the amount of gambling in a particular country, we can infer that if they are in business they must have clients who use the institutions. Furthermore, countries which allow such institutions may have a more favorable sentiment towards them. Not surprisingly, the top ten countries for gambling institutions show a positive and significant momentum premium of 0.0161 (t-statistic = 2.11). According to my findings, those countries not found in the top ten do not have a significant momentum premium associated with their markets. When estimating equation (1) for all countries and including an interaction between the top-ten variable and momentum, I find a coefficient estimate of 0.0115 that is not significantly different from zero at the .10 level. Again, I am only able to affirm weak supporting evidence that gambling institutions have a significant effect on the return premium found in a market. There may be an argument for adverse selection, in that, those individuals who frequent established gambling institutions may not be the same individuals who invest in financial markets. Inversely, those less sophisticated investors may be more partial to frequent a more anonymous medium of gambling, which will be discussed herein as online gambling. In our day and age, we can assume a liberal access to the stock market through the internet and online brokerage services. Perhaps a continuation of this study would examine any association with access to such online brokerage institutions. I notice the positive and significant results for *IdioVolt* persist in countries not in the top ten for gambling institutions. Perhaps this short-run risk premium has been

absorbed into the momentum premium in countries where gambling institutions are present.

I do not attempt to determine the wealth of investors nor their access to financial market information in this paper, so it cannot be said who participates in the market nor in gambling, but it can be agreed that broad access to the internet is commonplace in the countries included in this study. Much can be said about countrywide sentiment towards gambling whether it is allowed online or not. Results in table 5 are not limited to the top ten or otherwise qualifying criteria. The countries are split into two groups, the only criterion separating countries here is whether they allow legal online gambling or not. Those countries where online gambling is legal show a positive momentum premium which is significant at the 0.05 level (coefficient on Momentum = 0.0159, t-statistic = 2.47). However, the interaction term for legal online gambling and a 6-month momentum premium has a positive result (interaction estimate = 0.0126). However, the t-statistic is only 1.22 – again suggesting only weak evidence of my hypothesis. Not surprisingly, the effect of the book-to-market ratio remains relatively constant through these analyses. The effect seems to be slightly higher in countries where online gambling is legal. In all cases the results are positive and significant at the 0.01 level. Again, the existence of the positive momentum premium shows there is something happening in these countries that causes investors to believe and invest in stocks with a hot hand or investors under price stocks that have performed well and therefore exhibit a gamblers fallacy. These last few tables have examined the sentiment of gambling as directly related to laws and institutions in place for the countries included in the study. I have foregone a closer look at the market participants themselves in favor of these laws. In the

final table of the study I have taken a direct look at the individuals which may seem like a completely different approach, but my findings support those found in previous research, which is why I chose this parameter.

Table 6 uses the supported proxy variable which indicates a favorable sentiment for gambling in a certain country, which is the Catholic-Protestant ratio. The full extent of the research will not be explored in this paper, but it is enough to state the positive correlation between a high catholic-protestant ratio and acceptance of gambling, or a gambling culture, which is described and motivated in Kumar, Page, and Spalt (2011). The results in Table 6 is like those from previous tables. An expected positive and significant coefficient on book-to-market ratio, and a negative and significant coefficient on log of market capitalization (Ln(Size)) is reported in the table. The momentum premium is positive and significant in top ten countries with the highest catholic-to-protestant ratio (momentum coefficient = 0.0169, t-statistic = 5.00). For those countries not in the top ten the momentum premium, which remains positive, loses its statistical significance. The variables, natural log of market capitalization (Ln(Size)) and book to market ratio (B/M) remain consistent in the final regression from this table and have relative small movements in their estimates and statistical significance, with estimates ranging from 0.0052 to 0.0067 all significant at the 0.01 level. When estimating equation (1) for all stocks, the interaction between momentum and a high catholic-to-protestant ratio is also of interest. The estimate is 0.0148 which is statistically significant at the 0.05 level. The positive interaction estimate indicates that, relative to non-top ten countries, those countries with the highest Catholic-to-Protestant ratio have a stronger momentum premium. Combined with the findings in the first two columns in the table,

these results support the hypothesis that gambling attitudes help explain the momentum premium.

4. CONCLUSION

As I have found, a momentum premium exists, especially in countries with favorable attitudes towards gambling. There is weak evidence to suggest this premium is explained by the propensity to gamble with positive coefficient estimates on all interaction terms for gambling proxy variables and momentum.

People who prescribe to the hot hand fallacy tend to be prone to exercise an illusion of control as documented by Langer (1975), which states people who over or underestimate the probability of events do so because they feel their actions assert some sort of significant change in actual probability. In a coin flip or the roll of the dice there is no way to change the inherent probability. If an entire market feels the same way about certain stocks based on a momentum premium, because of their gambling cultures, the efficiency of those markets can be called into question. Furthermore, with such revealed preferences for momentum the chance for arbitrage in the financial markets of gambling countries could increase.

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Table 1 - Summary Statistics

The table statistics that describe the sample. For each of the 45 countries, I indicate the number of individual stocks, the number of stock-month observations, the CAPM Beta, the market capitalization (Size) in millions, the book-to-market ratio (B/M), the idiosyncratic volatility (IdioVolt), and the past six month return (Momentum). Both the beta and IdioVolt are derived using daily returns over a six-month rolling window. Betas are calculated with the market return being the value-weighted market return for the stocks in a particular country. Idiovolt is calculated as the standard deviation of residual returns, where residual returns are the residuals from the daily CAPM regressions.

	No. Stocks	No. Obs	Beta	Size	B/M	IdioVolt	Momentum
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Australia	2,812	287,730	0.8128	579.68	1.68563	6.247	0.1714
Austria	196	27,245	0.6952	675.53	5.72839	2.932	0.0661
Belgium	263	39,217	0.738	1,247.88	3.99727	2.794	0.0824
Brazil	570	54,947	0.2018	1,310.08	9.95355	6.734	0.3392
Canada	4,618	427,818	0.6157	584.59	1.99265	10.868	0.4762
Chile	254	33,091	1.0233	833.56	3.15264	255.811	17.2671
China	1,658	64,000	2.4081	1,068.96	3.96348	16.911	0.7447
Colombia	73	6,472	1.9477	1,895.83	5.77475	4.039	0.3159
CzechRep.	86	7,129	2.4387	813.68	5.80812	2.673	0.0464
Denmark	403	56,852	0.0801	525.72	4.67229	3.339	0.0692
Egypt	135	12,638	0.8817	564.41	3.34772	2.99	0.1383
Finland	203	30,111	0.4714	1,236.92	2.75622	3.044	0.0849
France	1,595	201,529	0.5378	1,595.34	3.78868	3.753	0.1068
Germany	1,494	205,310	0.5515	1,370.77	3.54267	3.186	0.0986
Greece	444	61,778	0.9242	367.36	3.93299	3.327	0.0618
HongKong	1,298	182,491	0.8219	1,000.32	2.74529	4.995	0.13
Hungary	69	7,397	0.2074	589.21	3.20563	6.894	0.1913
India	2,679	241,890	0.9062	484.51	3.56516	3.949	0.1494
Indonesia	513	59,191	0.3439	471.22	4.48014	5.911	0.2207
Ireland	168	22,154	0.6055	1,050.24	3.09358	3.483	0.109
Israel	621	61,587	1.1429	347.92	3.63611	4.426	0.1275
Italy	523	74,721	0.732	1,787.04	5.11291	2.18	0.0338
Japan	4,988	948,433	0.7235	1,168.52	3.52864	2.843	0.0545
SouthKorea	2,141	225,337	0.8188	471.62	4.43752	3.62	0.1459
Luxembourg	89	9,110	0.4841	1,911.1	5.92096	3.204	0.0878
Malaysia	1,k274	159,754	1.24	282.18	3.09974	4.429	0.1276
Mexico	196	22,232	0.8426	1,924.64	4.43404	3.643	0.0935
Morrocco	79	7,631	0.5766	826.47	2.23832	2.409	0.0731
Netherlands	392	57,396	0.7196	1,957.6	3.00608	2.413	0.079
NewZealand	237	26,538	5.4614	295.85	1.72701	5.524	0.1462
Norway	447	47,028	-0.0703	704.03	4.93451	4.172	0.0993
Peru	176	15,037	1.3013	374.64	9.58527	6.767	0.4089
Philippines	283	37,195	0.4516	355.42	5.35117	6.617	0.183
Poland	546	42,284	0.7653	390.11	2.58307	3.496	0.1058
Portugal	144	18,275	0.9815	840.75	5.08967	4.601	0.0999
Russia	516	25,280	42.4303	3,237.67	3.86473	8.568	0.3648
Singapore	856	108,125	0.9779	524.28	2.19445	4.883	0.1598
SouthAfrica	851	72,937	0.7831	751.3	2.73154	7.602	0.2502
Spain	281	40,756	0.7332	2,871.55	3.63251	2.288	0.0491
Sweden	772	84,302	0.2987	886.67	2.96438	4.204	0.1199
Switzerland	432	70,470	0.6762	2,628.67	4.95163	2.622	0.0722
Taiwan	1,892	207,115	0.7628	478.38	2.34387	2.691	0.056
Thailand	699	83,603	0.2365	321.52	3.31166	3.982	0.1206
Turkey	391	47,394	0.8343	553.96	2.59717	2.829	0.1298
UK	4,836	577,930	0.5985	1,134.48	2.06885	2.468	0.0566
AVERAGE	**959.8444**	**113,321.3**	**1.815896**	**1,006.493**	**3.922948**	**10.14136**	**0.535871**

Table 2 - Fama-MacBeth Regression Coefficients by Country

The table reports the regression results from estimating the following equation.

$$Ret_{i,t+1,c} = \alpha + \beta_1 Beta_{i,t,c} + \beta_2 Ln(Size_{i,t,c}) + \beta_3 B/M_{i,t,c} + \beta_4 IdioVolt_{i,t,c} + \beta_5 Momentum_{i,t,c} + \varepsilon_{i,t+1,c}$$

The dependent variable is the return for stock *i* in month *t+1*, in country *c*. The independent variables, data taken from month *t*, include CAPM betas (Beta), the natural log of market capitalization (Ln(Size)), the book-to-market ratio (B/M), the idiosyncratic volatility (IdioVolt), and the past six month return (Momentum). The regressions are estimated using a Fama-MacBeth (1973) approach. I denote statistical significance using asterisks based on Newey-West (1987) standard errors. *, ** and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.

	Intercept	Beta	Ln(Size)	Ln(B/M)	IdioVolt	Momentum
	[1]	[2]	[3]	[4]	[5]	[6]
Australia	0.0263***	-0.0005	-0.0031***	0.0068***	0.0125	0.0116***
Austria	0.0078	0.0003	-0.0011	0.0024***	0.1849	0.0135
Belgium	0.0250***	0.0050	-0.0031***	0.0033***	-0.3188**	0.0261***
Brazil	0.0592***	-0.0032*	-0.0081***	0.0072***	-0.1350**	0.0431***
Canada	0.0324***	0.0003	-0.0066***	0.0144***	0.2063	0.0119
Chile	0.0260***	-0.0007	-0.0021**	0.0028	-0.1498**	0.0165**
China	0.0423*	0.0031	-0.0119***	0.0192***	0.2867	-0.0038
Colombia	0.0394*	0.0061	-0.0054	0.0063	-0.1631	-0.0118
CzechRep.	0.0293***	-0.0053	-0.0015	0.0070***	-0.6823***	0.0216*
Denmark	0.0103	0.0008	-0.0011	0.0027***	0.0200	0.0246***
Egypt	0.0715***	-0.0110	-0.0073**	0.0001	-0.3176	0.0089
Finland	-0.6498	0.2083	0.0715	0.1666	0.1511	0.0177***
France	0.0121**	0.000	-0.0014**	0.0069***	0.0185	0.0149***
Germany	0.0124***	-0.0026	-0.0008**	0.0037***	-0.0006	0.0083***
Greece	0.0327**	-0.0042	-0.0040**	0.0059***	0.0111	0.0095*
HongKong	0.0286***	-0.0022	-0.0036***	0.0087***	.00934	0.0180***
Hungary	-0.0023	-0.0020	0.0002	0.0116***	0.1031	0.0021
India	0.0249*	-0.0020	-0.0029**	0.0017	0.1224	0.0104**
Indonesia	0.0283**	0.0015	-0.0051***	0.0144***	0.0732	0.0071
Ireland	0.0238**	0.0007	-0.0028	0.0029**	-0.1309	0.0092
Israel	0.0258*	0.0235	-0.0063**	0.0075***	0.0390	0.0452***
Italy	0.0125**	0.0013	-0.0008	0.0029***	-0.2394**	0.0155***
Japan	0.0248***	0.0028	-0.0025***	0.0035***	-0.2118***	0.0058
SouthKorea	0.0140	0.0011	-0.0068***	0.0165***	0.4540**	0.0618***
Luxembourg	0.0212	-0.0019	-0.0013	0.0033*	0.0872	0.0125
Malaysia	0.0077	0.0012	-0.0010	0.0074***	-0.0983*	0.0058
Mexico	-0.0035	-0.0025	0.0016*	0.0068***	-0.0356	0.0058
Morocco	0.0179	-0.0005	-0.0008	0.0032	0.1200	0.0204
Netherlands	0.0277	-0.0093**	-0.0005	0.0056**	-0.0704	0.0530*
NewZealand	0.0398**	-0.0021	-0.0051	-0.0016	-0.2663	0.0267***
Norway	0.0160**	-0.0013	-0.0017*	0.0040***	0.0154	0.0255***
Peru	0.0852*	-0.0479	-0.0043**	0.0078	-0.4408	0.0297
Philippines	0.0316**	-0.0035*	-0.0049***	0.0109**	0.1901***	-0.0391**
Poland	0.0399**	-0.0081	-0.0043**	0.0073***	-0.3167*	0.0269***
Portugal	0.0073	0.0011	-0.0014*	0.0060***	0.0908	0.0082
Russia	0.1776	-0.1467	-0.0081	-0.0098	0.1160	0.0176
Singapore	0.0177**	0.0005	-0.0022**	0.0073***	-0.0250	0.0156***
SouthAfrica	0.0276***	0.0019	0.0049***	0.0075***	0.0556	0.0100**
Spain	0.0113	-0.0176	0.0015	0.0029	0.1790	0.0145
Sweden	0.0171**	-0.0007	-0.0016**	0.0072***	-0.0503	0.0149***
Switzerland	0.0030	0.0094	-0.0029	0.0044*	0.5321	-0.0145
Taiwan	0.0181	0.0051	-0.0050	0.0108***	0.0423	0.0126**
Thailand	0.0242***	0.0011	-0.0041***	0.0093***	-0.1156**	0.0154***
Turkey	0.0171	0.0085	-0.0022	0.0121***	0.0140	0.0046
UK	0.0171***	0.0012	-0.0022***	0.0060***	0.0206	0.0205***

Table 3 - Fama-MacBeth Regression Results By Gambling Loss per Adult

Fama-MacBeth (1973) regression results using t-statstics from Newey-West (1987) adjusted standard errors testing countries ranked on "Gambling Losses Per Adult". The formal equation for estimations:

$Ret_{i,t+1,c} = \alpha + \beta_1 Beta_{i,t,c} + \beta_2 Ln(Size_{i,t,c}) + \beta_3 B/M_{i,t,c} + \beta_4 IdioVolt_{i,t,c} + \beta_5 Momentum_{i,t,c} + \varepsilon_{i,t+1,c}$

The return for stock *i* in month *t+1* in country *c is* the dependent variable. The other independent variables, also in month *t*, include CAPM betas (Beta), the natural log of market capitalization (Ln(Size)), the book-to-market ratio (B/M), the past six month return (Momentum), the idiosyncratic volatility (IdioVolt). Column [1] reports the results when I estimate the above equation for those countries ranked in the top 10 in Gambling Losses while column [2] shows the results for those countries not ranked in the top 10 in Gambling Losses. Column [3] estimates the above equation for all countries observed. Finally, column [4] reports the results for all observations including the dummy variable for *HighGambLoss* and the interaction term for *Momentum* and *HighGambLoss.* Country fixed effects are included in each specification but not reported. *, ** and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.

	Top 10 Gambling Losses	Non-Top 10	All Observations	
	[1]	[2]	[3]	[4]
Intercept	0.0227***	0.0239***	0.0239***	0.0238***
	(4.14)	(4.95)	(5.12)	(5.11)
Beta	-0.0003	-0.0003	-0.0003	-0.0002
	(-0.19)	(-0.43)	(-0.41)	-0.30
Ln(Size)	-0.0032***	-0.0035***	-0.0034***	-0.0034***
	(-5.38)	(-4.96)	(-5.46)	(-5.40)
Ln(B/M)	0.0068***	0.0066***	0.0066***	0.0066***
	(8.35)	(6.70)	(7.32)	(7.35)
IdioVolt	0.0746*	0.1133**	0.1053**	0.1047
	(1.67)	(2.48)	(2.60)	(2.55)
Momentum	0.0122***	0.0044	0.0048	0.0048
	(3.60)	(0.96)	(1.17)	(1.08)
HighGambLoss				-0.0005
				(-0.27)
Momentum×HighGambLoss				0.0064
				(1.35)

Table 4 - Fama-MacBeth Regression Results By countries with gambling institutions

The table reports Fama-MacBeth (1973) regression results with t-statstics from Newey-West (1987) adjusted standard errors for countries ranked on "Gaming Institutions". The formal equation that is estimated is given below:

$Ret_{i,t+1,c} = \alpha + \beta_1 Beta_{i,t,c} + \beta_2 Ln(Size_{i,t,c}) + \beta_3 B/M_{i,t,c} + \beta_4 Momentum_{i,t,c} + \beta_5 IdioVolt_{i,t,c} + \varepsilon_{i,t+1,c}$

The dependent variable is the return for stock *i* in month *t+1*, in country *c*. The independent variables, which are measured in month *t*, include CAPM betas (Beta), the natural log of market capitalization (Ln(Size)), the book-to-market ratio (B/M), the past six month return (Momentum), the idiosyncratic volatility (IdioVolt). Column [1] reports the results when I estimate the above equation for those countries ranked in the top 10 in Gambling Losses, column [2] shows the results for those countries not ranked in the top 10 in Gaming Institutions. Column [3] estimates the above equation for all countries observed. Finally, column [4] estimates the equation above for all observations with the addition of the dummy variable for legalized gambling institutions and an interaction term for the momentum premium and legalized gambling institutions. Country fixed effects are included in each specification but not reported. *, ** and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.

	Top 10 Gambling Institutions	Non-Top 10	All Observations	
	[1]	[2]	[3]	[4]
Intercept	0.0240***	0.0168**	0.0239***	0.0217***
	(5.00)	(3.60)	(5.12)	(4.96)
Beta	-0.0004	-0.0008	-0.0003	-0.0007
	(-0.37)	(-0.74)	(-0.41)	(-1.03)
Ln(Size)	-0.0038***	-0.0022***	-0.0034***	-0.0032
	(-5.25)	(-4.01)	(-5.46)	(-6.49)
Ln(B/M)	0.0094***	0.0061***	0.0066***	0.0070***
	(3.95)	(8.82)	(7.32)	(7.67)
IdioVolt	0.0930	0.1555**	0.1053**	0.1077*
	(1.57)	(2.32)	(2.60)	(2.63)
Momentum	0.0161**	0.0013	0.0048	0.0025
	(2.11)	(0.40)	(1.17)	(0.81)
HighGameInst				0.0022
				(0.80)
Momentum×HighGameInst				0.0115
				(1.12)

Table 5 - Fama-MacBeth Regression Results By Countries with Legal Online Gambling

The table reports Fama-MacBeth (1973) regression results with t-statstics from Newey-West (1987) adjusted standard errors for countries ranked on "Online Gambling". The formal equation that is estimated is given below:

$$Ret_{i,t+1,c} = \alpha + \beta_1 Beta_{i,t,c} + \beta_2 Ln(Size_{i,t,c}) + \beta_3 B/M_{i,t,c} + \beta_4 Momentum_{i,t,c} + \beta_5 IdioVolt_{i,t,c} + \varepsilon_{i,t+1,c}$$

The dependent variable is the return for stock *i* in month *t+1*, in country *c*. The independent variables, which are measured in month *t*, include CAPM betas (Beta), the natural log of market capitalization (Ln(Size)), the book-to-market ratio (B/M), the past six month return (Momentum), the idiosyncratic volatility (IdioVolt). Column [1] reports the results when I estimate the above equation for those countries with legalized online gambling while column [2] shows the results for those countries without legalized online gambling. Column [3] estimates the above equation for all countries observed. Finally, column [4] estimates the equation above for all observations with the addition of the dummy variable for a legalized online gambling and an interaction term for the momentum premium and legalized online gambling. Country fixed effects are included in each specification but not reported. *, ** and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.

	Legal Online Gambling	Illegal Online Gambling	All Observations	
	[1]	[2]	[3]	[4]
Intercept	0.0218***	0.0191***	0.0239***	0.0221***
	(4.47)	(4.02)	(5.12)	(5.14)
Beta	-0.0007	-0.0008	-0.0003	-0.0007
	(-0.64)	(-0.89)	(-0.41)	(-0.86)
Ln(Size)	-0.0039***	-0.0023***	-0.0034***	-0.0032***
	(-6.28)	(-4.10)	(-5.46)	(-6.36)
B/M	0.0088***	0.0065***	0.0066***	0.0069***
	(4.11)	(8.54)	(7.32)	(7.56)
IdioVolt	0.1903*	0.0758	0.1053**	0.1096**
	(1.97)	(1.23)	(2.60)	(2.65)
Momentum	0.0159**	0.0052	0.0048	0.0028
	(2.47)	(1.59)	(1.17)	(0.91)
LegalOnline				0.0014
				(0.53)
Momentum×LegalOnline				0.0126
				(1.22)

Table 6 - Fama-MacBeth Regression Results By Countries with the Highest Catholic-Protestant Ratio

The table reports Fama-MacBeth (1973) regression results with t-statstics from Newey-West (1987) adjusted standard errors for countries ranked on "Catholic-Protestant Ratio". The formal equation that is estimated is given below:

$$Ret_{i,t+1,c} = \alpha + \beta_1 Beta_{i,t,c} + \beta_2 Ln(Size_{i,t,c}) + \beta_3 B/M_{i,t,c} + \beta_4 Momentum_{i,t,c} + \beta_5 IdioVolt_{i,t,c} + \varepsilon_{i,t+1,c}$$

The dependent variable is the return for stock *i* in month *t+1*, in country *c*. The independent variables, which are measured in month *t*, include CAPM betas (Beta), the natural log of market capitalization (Ln(Size)), the book-to-market ratio (B/M), the past six month return (Momentum), the idiosyncratic volatility (IdioVolt). Column [1] reports the results when I estimate the above equation for those countries with the highest catholic-protestant ratio while column [2] shows the results for those countries with the lowest catholic to protestant ratio. Column [3] estimates the above equation for all countries observed. Finally, column [4] estimates the equation above for all observations with the addition of the dummy variable for a High catholic to protestant ratio and an interaction term for the momentum premium and HighCPRatio. Country fixed effects are included in each specification but not reported. *, **, and *** denote statistical significance at the 0.10, 0.05, and 0.01 levels.

	Top 10 CP Ratio	Non-Top 10	All Observations	
	[1]	[2]	[3]	[4]
Intercept	0.0126**	0.247***	0.0239***	0.0237***
	(2.57)	(5.06)	(5.12)	(5.02)
Beta	-0.0004	-0.0001	-0.0003	-0.0002
	(-0.35)	(-0.17)	(-0.41)	(-0.35)
Ln(Size)	-0.0015**	-0.0037***	-0.0034***	-0.0034***
	(-3.16)	(-5.33)	(-5.46)	(-5.38)
B/M	0.0052***	0.0067***	0.0066***	0.0066***
	(7.16)	(7.10)	(7.32)	(7.37)
IdioVolt	0.0944	0.1130**	0.1053**	0.1106**
	(1.54)	(2.62)	(2.60)	(2.73)
Momentum	0.0169***	0.0037	0.0048	0.0037
	(5.00)	(0.86)	(1.17)	(0.87)
HighCPRatio				-0.0012
				(-0.53)
Momentum×HighCPRatio				0.0148**
				(2.91)