

# An Analysis of Gambling Expenditure Across Countries

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## Abstract

This study hypothesized that gambling expenditure across countries was positively related to income and negatively related to uncertainty avoidance. Statistical analyses using secondary data were conducted to test the hypotheses. The results of a multivariate linear regression using income and uncertainty avoidance as the independent variables and gambling expenditure as the dependent variable showed that the two independent variables were significantly related to gambling expenditure. The two independent variables explained 56 percent of the variance in the dependent variable. An exponential model with only income as the independent variable, however, accounted for 72 percent of the variance in gambling expenditure. The results showed that income alone accounted for a substantial amount of variance in gambling expenditure. The study discussed the implications of the results.

**Keywords:** gambling expenditure, income, uncertainty avoidance

## Introduction

The purpose of this research was to determine the factors that were related to gambling expenditure across countries. It is surprising to note that even though there are many studies related to gambling, few have analyzed gambling expenditure globally. Most gambling research focused on individuals and the results obtained were based on data collected from respondents within a geographic location. The current study is different, however. It used national level data to conduct analyses about gambling expenditure across countries. This study proposed that on a per capita basis, gambling expenditure was positively related to income and negatively related to uncertainty avoidance. The results of this research could contribute to our knowledge about factors that influenced people to gamble. The results might be particularly useful to gambling operators who are interested to know more about the profiles of gamblers globally.

This paper is organized as follows. The next section provides the background on the key variables related to gambling expenditure. It also states the hypotheses that would be tested in this study. This is followed by sections on data collection, data analysis, and results. The paper then concludes with a discussion on the implications and limitations of the study.

## Key variables related to gambling expenditure

As mentioned earlier, there are limited studies that examined gambling from a global perspective. In one related study, Binde (2005) used ethnographic and historical evidence to trace the evolution of gambling. He found that gambling was not a universal phenomenon and that several factors influenced the likelihood of gambling being practiced in societies. One factor that influenced gambling was the presence of commercially used money. Gambling became popular when people started using currency and when trade and commerce flourished. This research finding suggests that people gamble more when they have more money.

Prior research has examined why people gamble based on different perspectives. According to the economics perspective, people are rational beings. They are not likely

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to gamble if they know that the odds of winning are against them. Those who gamble, therefore, are not rational or they really do not know that the odds of winning are against them. There are many people who continue to gamble, however. The inference that those who gamble are not rational may therefore be simplistic. MacLaurin and Hashimoto (2008) used Veblen's theory of conspicuous consumption (Veblen, 1994) to further understand gamblers' motivation. Veblen's theory is based on the evolution of a leisure class whose members are not required to work but appropriate a surplus produced by those who work. Gambling is a conspicuous activity and members of the leisure class engage in it to signal their wealth. They gamble to demonstrate their standing in the social hierarchy. The more money they have, the more they will gamble.

Another compelling reason why people with more money gamble more is because those with less money have little money for discretionary purposes, and so the immediate and disruptive consequences of gambling could act as a deterrent to gambling. People who gamble can afford to lose as they have more money to spare. Prior surveys conducted in a number of countries have observed that there is a positive correlation between income and gambling. In Canada, Marshall (1998) has noted that household expenditure on gambling increased with household income. In Australia, Layton and Worthington (1999) have shown that income levels have a positive influence on the probability of households gambling. In Britain, survey results showed that gambling participation rates in the higher income households are higher than those in the lower income households (NatCen, 2007). In the U.S., Christiansen (1998) noted that between 1982 and 1996, consumers spent a larger percentage of their growing personal income on legal gambling. Also in the U.S., Zimmerman (2003) and Harrah's Survey (2006) both showed that casino gambling is positively linked to income. Based on these results as well as the theoretical underpinnings, it is likely that gambling expenditure is positively related to income across countries. This relationship will therefore be tested in this study.

Gambling also involves some form of uncertainty in its outcome. Those who want to avoid uncertainty are likely to avoid gambling. Raylu and Oei (2004) studied the role of culture in gambling and suggested that certain cultural groups are more vulnerable to gambling. Uncertainty avoidance is a cultural dimension proposed by Hofstede (1991) and it measures the extent to which cultures tolerate ambiguity and uncertainty. People in a high uncertainty avoidance culture attempt to create as much certainty as possible in their day-to-day living. They prefer predictable situations that lead to reduction in ambiguity (Usunier and Lee, 2005). People in a low uncertainty avoidance culture, on the other hand, are less skeptical about anything considered unknown (Kwak et al., 2006). As a result, people in such a culture are more accepting of unpredictable events and they may be more receptive to gambling.

Prior research has shown that uncertainty avoidance has an effect on how people react to events and activities. For example, Choi and Kim (2008) found that "scratch and save" marketing promotions, which have the characteristics of uncertainty in enabling consumers to save on their spending, stimulated differential interests among people in Canada and Korea – due to differences in the levels of uncertainty avoidance. Prior research has not examined whether uncertainty avoidance and gambling are related across countries. Based on the foregoing discussion, it is likely that people in low uncertain avoidance countries are likely to gamble more than people in high uncertain avoidance countries. Hence, the negative relationship between uncertainty avoidance and gambling expenditure will be tested in this study.

To summarize, income and uncertainty avoidance are the two variables that will be tested in this study to determine if they are related to gambling expenditure across countries.

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**Data collection**

This research made use of secondary data. Gambling expenditure is represented by gross gambling yield per capita (GGYPC). Gross gambling yield refers to the gross turnover less the amount paid to customers as winnings. It is the punters' losses and it represents the real economic value of the gambling industry. GGYPC is the gross gambling yield per person in a country. The data for GGYPC were obtained from the Global Betting and Gaming Consultants' Report (GBGC, 2002). The data in this report were based on the calendar year 2000.

Income is represented by gross domestic product per capita (GDPPC). The data for GDPPC were also obtained from GBGC (2002). They were based on the year 2000. The scores for uncertainty avoidance were based on the uncertainty avoidance index (UAI) (Hofstede, 2001). This index measures the level of uncertainty avoidance for people within a country. A sample of 42 data points was compiled for which the GGYPC, GDPPC, and UAI scores were available. Table 1 shows the data used for the analysis in this study.

**Table 1: Research data**

No.	Country	Gross gambling yield per capita (£)	GDP per capita (US\$)	Uncertainty Avoidance	No.	Country	Gross gambling yield per capita (£)	GDP per capita (US\$)	Uncertainty Avoidance
1	Argentina	25.59	12900	86	22	Japan	145.95	24900	92
2	Australia	283.98	23200	61	23	Malaysia	34.99	10300	36
3	Austria	60.89	25000	70	24	Mexico	2.23	9100	82
4	Belgium	30.57	25300	94	25	Netherlands	51.76	24400	53
5	Brazil	6.22	6500	76	26	New Zealand	110.14	17700	49
6	Canada	160.94	24800	48	27	Norway	235.15	27700	50
7	Chile	8.96	10100	86	28	Panama	44.82	6000	86
8	China	1.58	3600	60	29	Philippines	6.31	3800	44
9	Columbia	5.37	6200	80	30	Poland	21.8	8500	93
10	Czech Rep	25.26	12900	74	31	Portugal	32.36	15800	104
11	Denmark	60.19	25500	23	32	Singapore	230.31	26500	8
12	Finland	95.28	22900	59	33	South Africa	13.86	8500	49
13	France	66.86	24400	86	34	South Korea	18.54	16100	85
14	Germany	34.37	23400	65	35	Spain	130.02	18000	86
15	Greece	51.43	17200	112	36	Sweden	102.64	22200	29
16	Hong Kong	196.08	25400	29	37	Switzerland	60.66	28600	58
17	Hungary	21.65	11200	82	38	Taiwan	22.59	17400	69
18	India	3.59	2200	40	39	Thailand	3.8	6700	64
19	Ireland	84.93	21600	35	40	Turkey	5.66	6800	85
20	Israel	39.57	18900	81	41	UK	116.76	22800	35
21	Italy	77.93	22100	75	42	USA	252.62	36200	46

**Data analysis**

Scatter plots were first used to examine the data visually. Then, the study proceeded to perform the statistical analysis. Each of the independent variables (GDPPC and UAI) was first regressed separately on the dependent variable (GGYPC). Then, both the independent variables were regressed together on the dependent variable.

## Results

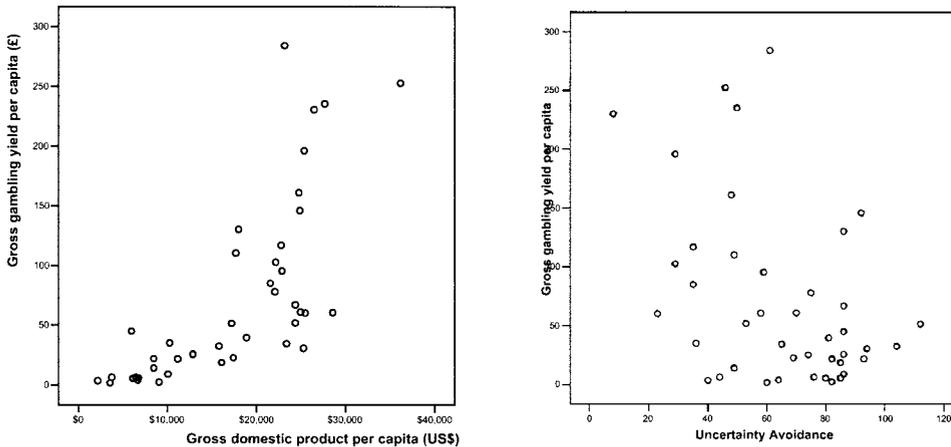
Table 2 shows the descriptive statistics and the correlation coefficients. As expected, the correlation coefficients indicate that GGYPC was positively correlated with GDPPC and negatively correlated with UAI. Note that GDPPC was not correlated with UAI.

**Table 2: Descriptive statistics and correlations of variables**

	Mean	SD	(1)	(2)
GGYPC in_ (1)	71	76		
GDPPC in US\$ (2)	17221	8470	0.71**	
UAI (3)	65	24	-0.42**	-0.28

\*\* p<0.01

Figures 1 and 2 show the scatter plots for each independent variable and the dependent variable. Visual inspection of Figure 1 showed there was a positive relationship between GGYPC and GDPPC. Furthermore, it was possible that the relationship between the two variables might be non-linear, as in the form of an exponential function. Arising from this visual inspection, therefore, an exponential curve estimation involving income and gambling expenditure was subsequently conducted. Note that visual inspection of the scatter plot in Figure 2 did not reveal a relationship between UAI and GGYPC.



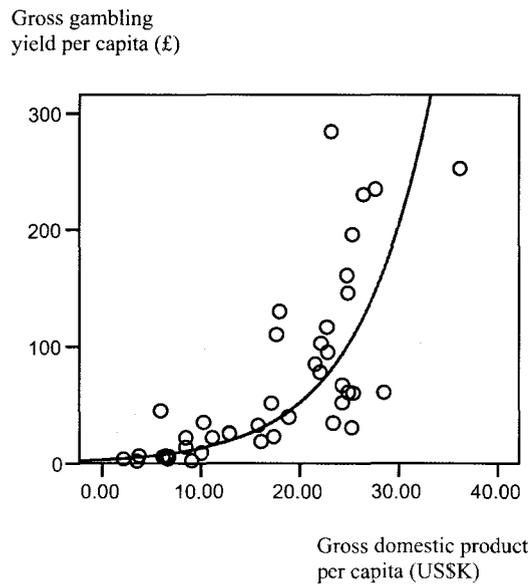
**Figure 1: Scatter plot for GDPPC and GGYPC    Figure 2: Scatter plot for UAI and GGYPC**

Table 3 shows the results of analysis. The results show that in the case of model 1, where GDPPC was regressed against GGYPC, GDPPC was positively related to GGYPC and GDPPC explained 51 percent of the variance in GGYPC. In the case of model 2, where UAI was regressed against GGYPC, UAI was negatively related to GGYPC and it explained 18 percent of the variance in GGYPC. When GDPPC and UAI were regressed as independent variables, they were both significant and in the expected direction. The two independent variables accounted for 56 percent of the variance in GGYPC. The results for model 4 pertain to the exponential curve estimation. The results show that GDPPC accounted for 72 percent of the variance in GGYPC. Model 4, therefore, provides a better model fit compared to the other models. Figure 3 shows the exponential curve for GDPPC versus GGYPC.

**Table 3: Results of analysis**

	Linear regression			Exponential curve estimation
	Model 1	Model 2	Model 3	Model 4
<b>Intercept</b>	-38.716	157.234	21.014	3.393
<b>GDPPC (USSK)</b>	6.374**		5.779**	0.137**
<b>UAI</b>		-1.328**	-0.763*	
<b>R-square</b>	0.510	0.177	0.564	0.716

\*\* p<0.01 \* p<0.05



**Figure 3: Exponential curve for GDPPC versus GGYPC**

### Discussion and conclusion

The results of this study showed that the two variables, income and uncertainty avoidance, were related to gambling expenditure across countries. They showed that GDPPC was positively related to GGYPC and UAI was negatively related to GGYPC. The relatively high explanatory power provided by GDPPC alone (R-square of 51 percent in the linear regression and 72 percent in the exponential curve estimation) showed that income was a substantial driving force behind gambling expenditure across countries.

The findings of this study have implications for both research and practice. In terms of research, the findings imply that income and uncertainty avoidance are critical variables that influenced gambling expenditure across countries. Prior research has not explored factors that were related to gambling expenditure across countries. The results of this study established empirically that income and uncertainty avoidance were indeed related to gambling expenditure. Future research can continue this line of research and determine if other variables were also related to gambling expenditure across countries. For example, future research can examine if the availability of gambling facilities was related to gambling expenditure. Future research can also examine whether the positive relationship between income and gambling expenditure was true across all types of gambling products.

In terms of practical implications, gambling operators need to take note that income explained a substantial part of gambling expenditure. Income, therefore, should be an important criterion when gambling operators decide where to locate their facilities and activities. It will be valuable for gambling operators to monitor income in various countries and then forecast the gambling expenditure. This would enable operators to anticipate business expansion or contraction in different locations. In the current economic downturn, for example, gambling operators need to determine which locations will be affected and adjust their operations to accommodate the changing patterns in gambling expenditure. Gambling operators should also note that uncertainty avoidance affects gambling expenditure. When other factors are held constant, countries with a culture that is inclined towards uncertainty acceptance will spend more on gambling.

The results of this study are subject to a number of limitations. These limitations pertain mostly to the data used in the analyses. First, this study used data for 42 countries, and they were based in the year 2000. The sample size was relatively small. It would have been better if there was a larger sample so that the statistical power of the analyses would be higher. Also, many gambling facilities have been built recently, especially in or near developing countries. Gambling expenditure in these countries may have changed. Analyses based on an updated set of data would be useful. Another limitation of this study was that illegal gambling was not included in the data. Often, in less developed countries, illegal gambling expenditure exceeds legal gambling expenditure. Inclusion of illegal gambling expenditure may possibly change the relationships found in this study.

Despite the limitations, the results obtained in this study were useful as they provided a snapshot picture of the key variables related to gambling expenditure across countries at a point in time. To reiterate, future research can use more recent data to study gambling expenditure across countries. In summary, the results of this research have found that income and uncertainty avoidance were related to gambling expenditure across countries and that income alone accounted for a substantial variance in gambling expenditure. These results provide useful information to the gambling operators and contribute significantly to our knowledge about factors influencing gambling expenditure across countries.

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