Do people gamble more in good times? Evidence from 27 European countries

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10 November 2016

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Abstract

We provide evidence of a positive relationship between the intensity of gambling and economic growth in 27 European countries for 2005–2013. Our proxy for gambling is represented by government revenues from taxes on lotteries, betting and gambling. This variable is linked to GDP growth in a panel regression framework and pooled OLS. However, when we split our sample to account for the heterogeneity among European countries, we found that the positive "gambling – GDP growth" relationship is driven extensively by the Central and Eastern European countries. It appears that people in these countries tend to gamble more when the economy is expanding.

JEL classification: L83, O1, O4

Keywords: gambling, lottery, GDP growth, European countries

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1. Introduction

Although it is still not clear why people play lotteries and gamble, many attempts have been made to find a definite answer.[1] Apart from the indisputable psychological and sociological aspects of gambling, there is also an economic point of view. Several studies showed that gambling is good for the economy. As noted by Gross (1998), various forms of gambling have been promoted by state and local governments as an easy way to raise revenues, while underlying economic studies are often sponsored by the industry. In recent literature, several authors do not hesitate to label gambling research as "a mess" (Cassidy et al., 2013; Young and Markham, 2015).

Suppose that the gambling industry is actually good for the economy and temporarily forget any other (broader) aspects of this industry. Our research interest explores the propensity to gamble with respect to the fluctuations in economic activity. Are people gambling more in recessions with a stronger desire to win as a last resort? Or do they gamble more in good times simply because they can afford it as a form of entertainment? One might suggest that the lottery players with lower incomes are motivated by the prospect of wealth, while those with higher incomes play for entertainment. Previous results of the relationship of gambling to household income did not exhibit any consistent pattern (e.g., Clotfelter and Cook, 1990). We follow a similar idea at the country level, focusing on growth rates instead of levels of national income.

In this paper, we utilized government revenues from taxes on lotteries, gambling and betting as our proxy of "gambling intensity". This variable may be considered a good proxy as long as there are no significant changes in the taxation policy during the analyzed period.

We linked together the annual growth of these revenues with the growth of GDP for 27 European countries for 2005–2013. We found a strong and, more importantly, a positive relationship between these two variables. When splitting our sample into EU-15 countries and countries from Central and Eastern Europe (CEE-12), we clearly show that this relationship is driven by the CEE-12 countries.

[1] For a comprehensive survey on this topic, refer to Ariyabuddhiphongs (2011).

2. Data and methodology

Our dataset includes 27 European countries[2], divided into two groups:

- EU-15 countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom).
- CEE-12 countries (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, and Slovenia).

To determine the relationship between gambling and the business cycle, we use the following data:

- Government revenues from taxes on lotteries, gambling and betting in millions of the national currency (the "lottery" variable).
- Gross domestic product at the market price in the national currency per inhabitant ("GDP growth").

Both variables are transformed into growth rates, so our final dataset comprises growth values from 2005 to 2013. We identified and removed one extreme outlier in the Czech Republic's growth of tax revenues from lotteries in 2012 (1546%), stemming from tax reform[3]. This tax reform introduced a new levy with higher rates, which replaced a partially abused producer's levy for purposes beneficial to society. An outlier for Romania was also removed for 2010 when the tax revenues declined to almost zero[4]. Basic descriptive statistics are available in Appendix A.

The issue of taxation is quite complicated because there are different tax rules for different forms of gambling. Other alternatives that might have been used include either the total money wagered (i.e., gross stakes) or net stakes obtained by subtracting the winnings. The problem with these variables is the lack of data availability for EU countries. Gross gaming revenues, both land-based and online (stakes less prizes but including bonuses), were estimated to be €84.9 billion in 2011 for the EU 27, with an average annual growth rate of 2.8% (European Commission, 2012).

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[2] All data are obtained from the Eurostat database. We excluded Cyprus and Malta as we decided to split our sample into EU-15 and CEE countries.

[3] Before 2012, producers that organized gambling or lotteries had to pay a levy based on their turnover. The levy had to be used for purposes beneficial to society and directly to beneficiaries of their own choosing instead of the state budget. Thus, only levies paid to municipalities have been included into the amount reported as taxes on lotteries, gambling and betting.

[4] Gambling activities in Romania are subject to an annual licensing fee, an annual authorization fee (a percentage of the amount collected by gambling organizers from players), a corporate tax, and an income tax on players' gains (Baciu and Albu, 2015). The fees are not recorded as taxes according to Eurostat.

Our baseline model is a simple pooled OLS regression:

$$lottery_i = \beta_0 + \beta_1 GDP\ growth_i + \varepsilon_i \quad (1)$$

We also estimated the relationship between these two variables within the panel regression framework to capture possible differences across countries and time. The Hausman test suggested using a panel regression with random effects, although the Breusch-Pagan Lagrange multiplier test for random effects failed to reject the null hypothesis in all cases. Thus, we decided to report results from both the fixed and random effects models (denoted as FE and RE). Panel unit-root tests suggested stationarity of both variables (Levin-Lin-Chu test and Breitung test). To test for heteroskedasticity, autocorrelation and cross-sectional dependence, we applied the Modified Wald test for groupwise heteroskedasticity, the Pesaran test for cross-sectional dependence and the Wooldridge test for serial correlation (performing well in small panels). From all possible problems, only heteroskedasticity seems to be an issue, so we report robust standard errors in our results. As a robustness check, we employed FGLS regressions incorporating correlated panels with the presence of autocorrelation and heteroscedasticity, yet the results remain the same.[5]

3. Results

First, we estimated regressions using a sample of all countries (see Panel A in Table 1). It appears that when the economy is growing, people spend more on lotteries and betting since the regression coefficient is positive and significant in all estimated models. Goodness of fit measured by the coefficient of determination (R-sq.) is surprisingly high (29.21). As there is still considerable heterogeneity among European countries, mainly due to differences in economic development, we decided to split our sample into two groups. In EU-15 countries (see Panel B in Table 1), the regression coefficient is notably lower, and the coefficient of determination is practically zero. To obtain a better perspective, we provide scatter plots capturing the relationship between two examined variables in Appendix 2. It is clear that the growth in revenue from the taxes on the lottery and the GDP growth are not significantly correlated in EU-15 countries. Surprisingly, the overall results are driven by the data from CEE-12 countries, which is apparent from both the regression results (Panel C in Table 1) and visualization. The regression coefficient is higher for these countries, always positive and highly significant. Moreover, our simple model describes 38% of the entire variability of the dependent variable.

[5] Detailed results are available upon request.

Table 1 Regression results.

	FE	RE	pooled OLS
Panel A: All countries (243 obs.)			
GDP growth	1.4262***	1.4079***	1.4063***
	(0.2523)	*(0.1904)*	*(0.1410)*
const.	-0.0199*	-0.0192	-0.0191*
	(0.0108)	*(0.0126)*	*(0.0112)*
R-sq.	0.2921	0.2921	0.2921
F-stat/Wald χ^2	31.9500***	54.6600***	99.4300***
Panel B: EU-15 (135 obs.)			
GDP growth	0.2876*	0.3396**	0.3648
	(0.1508)	*(0.1536)*	*(0.2765)*
const.	-0.0002	-0.0012	-0.0017
	(0.0029)	*(0.0131)*	*(0.0114)*
R-sq.	0.0129	0.0129	0.0129
F-stat/Wald χ^2	3.6400*	4.8900**	1.7400
Panel C: CEE-12 (108 obs.)			
GDP growth	1.7232***	1.6361***	1.6269***
	(0.2863)	*(0.2445)*	*(0.2005)*
const.	-0.0383*	-0.0320	-0.0313
	(0.0206)	*(0.0260)*	*(0.0220)*
R-sq.	0.3831	0.3831	0.3831
F-stat/Wald χ^2	36.2200***	44.7800***	65.8300***

*Note: "FE" and "RE" denote panel regressions with fixed effects and random effects, respectively. Robust standard errors are in parentheses. Symbols *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. For the RE model, instead of a standard F-test, a Wald χ^2 test is performed.*

4. Concluding remarks

Using a simple regression framework, we have shown that there is a statistically significant positive relationship between our proxy of gambling intensity and the business cycle, especially in the emerging CEE-12 countries. Our results suggest that people tend to gamble more in good times when the economy is expanding.

One factor that might have partially influenced this relationship is government decisions on taxes, although we have removed the most influential observations (outliers). With the growth of internet use and mobile phones, the competition in the EU and other countries in the world within the gambling sector increases. This effect leads to innovations, better prices and a wider choice for betting. These improvements, together with government decisions on tax rates, may present incentives for customers to place their bets outside the government's tax jurisdiction (abroad or conduct illegal betting) or support producers to move their operations to lower tax jurisdictions. An increase in such schemes would not be reflected in the tax

revenues of a particular country (and thus captured by our proxy), although many countries have updated their gambling legislation to respond to the rise of the online gambling sector.

We also avoided other aspects of gambling such as socio-economic factors. The inclusion of an unemployment variable to our model has not led to significant results and was thus excluded. We did find a statistically significant Granger causality between two analyzed variables on the first lag, so it also might be possible to predict the GDP growth by the revenues from taxes on the lottery, gambling and betting. We do not present these results in more detail, as further research is definitely needed.

Acknowledgement

This work was supported by the Slovak Grant Agency for Science (VEGA project No. 1/0402/15).

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Appendix A

Table A.1 Descriptive statistics.

		Mean	Std. Dev.	Min	Max
Panel A: All countries					
Lottery	overall	0.0410	0.1743	-0.5003	0.8338
	between		0.0700	-0.0548	0.1887
	within		0.1602	-0.5790	0.6972
GDP growth	overall	0.0427	0.0670	-0.1714	0.3380
	between		0.0357	-0.0025	0.1221
	within		0.0571	-0.2435	0.2659
Panel B: EU-15					
Lottery	overall	0.0054	0.1167	-0.3055	0.5963
	between		0.0470	-0.0548	0.1143
	within		0.1075	-0.2932	0.4874
GDP growth	overall	0.0195	0.0364	-0.1072	0.1031
	between		0.0106	-0.0025	0.0389
	within		0.0349	-0.0853	0.0890
Panel C: CEE-12					
Lottery	overall	0.0855	0.2193	-0.5003	0.8338
	between		0.0699	-0.0344	0.1887
	within		0.2088	-0.5345	0.7417
GDP growth	overall	0.0718	0.0834	-0.1714	0.3380
	between		0.0347	0.0271	0.1221
	within		0.0765	-0.2145	0.2950

Appendix B

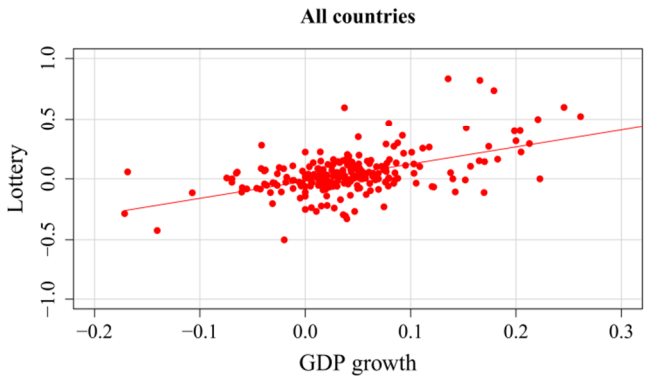

Fig. B.1 "Lottery – GDP growth" relationship in all countries in the sample.

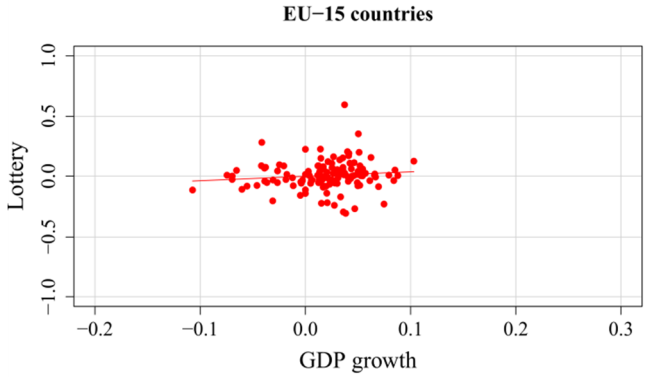

Fig. B.2 "Lottery – GDP growth" relationship in EU-15 countries.

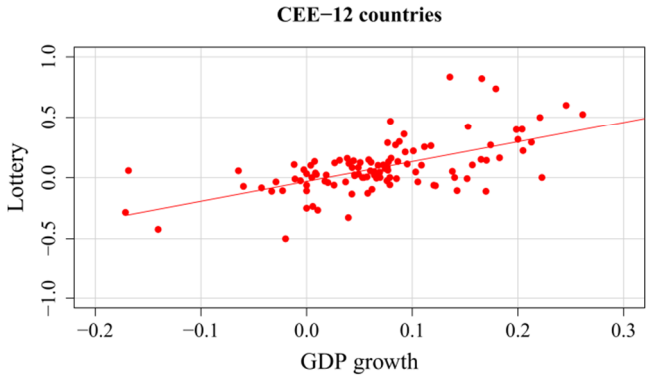

Fig. B.3 "Lottery – GDP growth" relationship in CEE-12 countries.