

Entrepreneurship and Economic Conditions: Evidence from Regional Windfall Gains

November 1, 2018

Abstract

We study the effect of local economic conditions on entrepreneurial activity using the randomized assignment of monetary prizes provided by the Spanish Christmas Lottery. Because each ticket number is mostly sold by one local outlet, lottery winners tend to be geographically concentrated. That is, these events reflect the sum of the effect from lottery prizes on winners and the effect on the rest of the community. We find higher creation of new firms in awarded provinces. This increase is also present in firms that are less dependent on local demand conditions, and it is larger in regions with low access to finance, supporting the hypothesis that financial constraints can impair firm creation. Conditional on entry, these new firms use less debt, have higher survival rates and higher employment growth. This entrepreneurial activity is almost entirely driven by national, middle-age and male individuals in the manufacturing and service sectors. Our results suggest that local demand and financial constraints are important drivers of entrepreneurial activity.

JEL classification: D14, L26

Keywords: Entrepreneurship, Firm creation, Local demand, Financial constraints, Economic growth, Self-employed Characteristics

1 Introduction

Promoting an entrepreneurial society is a priority shared by many governments worldwide as new firms are key to economic growth and job creation ([Ayyagari, Demirguc-Kunt, and Maksimovic \(2011\)](#), [Haltiwanger, Jarmin, and Miranda \(2013\)](#)). Thus, identifying and understanding the economic mechanisms that affect firm creation is important. Specifically, how entrepreneurial activity responds to changes in economic conditions and financial constraints is critical to evaluate economic policies, such as changes to retirement systems, the provision of government loans, and tax policy.

The relation between entrepreneurial wealth and firm creation has received considerable attention in the literature. There is substantial evidence showing a strong correlation between wealth and the propensity to start a business ([Evans and Jovanovic \(1989\)](#), [Evans and Leighton \(1989\)](#), [Holtz-Eakin, Joulfaian, and Rosen \(1994\)](#)). However, the precise economic mechanisms underlying the role of wealth in firm creation are not well understood. [Hurst and Lusardi \(2004\)](#) report that the relation between wealth and business entry is mostly flat. In contrast, [Adelino, Schoar, and Severino \(2015\)](#) and [Schmalz, Sraer, and Thesmar \(2017\)](#) show that real estate collateral is important for entry into entrepreneurship.

It is challenging to identify the causal effect of economic conditions and financial constraints on firm creation for several reasons. Individuals with wealthier family members have less credit constraints and are more likely to start a firm, but they may also have greater access to business opportunities for reasons unrelated to their wealth. In addition, when the economy is performing well, there are less incentives to start up new firms. In short, the relation between entrepreneurial activity, economic conditions, and credit constraints are jointly determined in equilibrium. Therefore, it is difficult to empirically identify how economic conditions and credit constraints affect entrepreneurial activity.

In this paper, we study the effect of economic conditions and financial constraints on firm creation by exploiting a unique randomized natural experiment: the Spanish Christmas Lottery. This lottery is more of a social event than a gamblers' lottery, in which about 75% of the population participates. In addition, its economic impact is quite large – participants

spend more than 3 billion euros on the Christmas Lottery, amounting to about 0.3% of the country's gross domestic product (GDP). This lottery does not award one big prize to a few individuals, but to several thousand individuals sharing the same ticket number. Since each number is mostly sold by one lottery outlet, winners tend to be geographically concentrated. That is, these events reflect the sum of the effect from lottery prizes on winners and the effect on the rest of the community. Using National Accounts statistics, [Bagues and Esteve-Volart \(2016\)](#) show that prizes are collected during the same year and in the province where the tickets were sold. They show that each euro of lottery prize implies an increase in households' disposable income of 88 cents in the province and year in which prizes are collected. The impact of this lottery is economically significant – the province awarded with the maximum prize per capita receives an income shock equivalent to 3.5% of its GDP. In this paper, we use the Christmas Lottery expenditures and prizes to identify random regional variation in economic conditions and financial constraints in the 1992-2015.

We find that regional windfall gains originated by the Christmas Lottery have a significant effect on entrepreneurial activity. The number of new businesses significantly increases in winning provinces. The effect is economically sizable: the growth rate of the number of firms (i.e., net entry rate) in winnings provinces increases by almost 1% compared to non-winning provinces in a given year. Considering that the average net entry rate is 6% in our sample period, the effect of the lottery income shock represents more than 15% of the average.

One possible concern with our methodology is that in regions where the economic conditions improve, households might spend more in the Christmas Lottery, affecting the odds of holding the winning tickets. To address these concerns, we include several macroeconomic variables at the province level as controls and estimate regressions with province fixed-effects. We also control for the total expenditures in lotteries and regional banking system characteristics. We also estimate specifications excluding the largest province and the province where individuals purchase more tickets. Our results remain unchanged.

We analyze how the lottery income shock affects the dynamics of firm growth over time.

Net firm growth increases at about the same rate in winning and non-winning provinces in the years before the lottery prize, mitigating concerns of preexisting differential trends. After the lottery award, firm growth increases significantly more in winning provinces than in non-winning provinces. This significant difference vanishes three years after the lottery was granted.

We also investigate how the lottery income shock affects firm entry and exit rates rather than just the net entry rate. We find a positive and significant effect in entry rates of winning provinces and an insignificant effect in exit rates.

We also show that our results are not driven by certain industries. The effect on the entry rate is positive and significant for businesses operating in industries that depend more on local demand (i.e., non-tradable industries). Our findings suggest that regional windfall gains can have a substantial economic benefit for local economies through a multiplier effect on local spending. The effect on the entry rate is also positive and significant in tradable and manufacturing industries with a similar magnitude to that in non-tradable industries. Tradable and manufacturing industries do not rely as much on local demand. Moreover, the effect is especially pronounced in regions with lower access to finance. These findings are consistent with financial constraints impairing firm creation. We conclude that both local aggregate demand and financial constraints are important drivers of entrepreneurial activity.

We also examine what is the legal type of new firms created from the lottery and the growth of firms according to capital requirements. We find that the effect in limited liability companies is larger than in public liability companies. We also find a stronger effect on firms in industries that require less initial capital. These results suggest that small firms, which are more likely to be financially constrained, are those that benefit the most from the lottery income shock. This is consistent with the notion that banks are often reluctant to finance small start-ups because of high uncertainty, information asymmetry, and agency costs ([Beck, Demirgüç-Kunt, and Maksimovic \(2005\)](#)).

We examine the survival of firms created at the time of the lottery prize. In a frictionless capital market, personal wealth should not affect neither the decision to enter self-employment

nor the scale of the business that is started. However, in the presence of frictions, self-employment would be related to wealth and collateral value (Evans and Jovanovic (1989)). In this setting, skilled entrepreneurs would be prevented from starting new business due to lack of financial resources. We find that firms created in winning provinces have higher survival rates. This is still the case even when we eliminate from the sample the firms that depend heavily on local demand (firms in the construction and non-tradable sector). Since these firms that depend less on local demand have higher survival rates, we conclude that individuals are not just taking advantage of the good local economic conditions. This result supports the hypothesis that financial constraints restrict skilled individuals to turn ideas into a successful business.

We study the differences in the growth of assets, sales, employment, wages and leverage of new firms created in winning provinces. We find that firms as response of the lottery shock have higher survivor rates, are larger, riskier and exhibit a higher value added and wage bill. Once we exclude firms that depend heavily on local demand (firms in the construction and non-tradable sector), we find that treated firms are less indebted, and have higher employment and sales growth. These results are consistent with Sedláček and Sterk (2017), who find that firm success is influenced by the economic conditions at the time of entry.

Finally, we focus on the effect of the lottery on self-employment. We find a positive and significant increase in the growth of self-employed individuals as a response of the lottery shock. In particular, there is a positive and significant increase on entrepreneurs that are males, nationals, middle-age, and without pluriactivity. Moreover, the growth of entrepreneurship is especially significant on the services sector, and among individuals that hire at least one employee.

Our study contributes to three strands of the literature. First, we contribute to a growing literature that uses lottery data as an exogenous liquidity shock to study a number of individual decisions. This literature focuses on the effects of lottery prizes on labor supply (Imbens, Rubin, and Sacerdote (2001), Cesarini, Lindqvist, Notowidigdo, and Ostling (2017)), individual bankruptcy (Hankins, Hoekstra, and Skiba (2011)), and consumption

(Kuhn, Kooreman, Soetevent, and Kapteyn (2011)). More recently, Bagues and Esteve-Volart (2016) use lottery prizes to study the effect of economic conditions on national election outcomes in Spain, and Cesarini, Lindqvist, Notowidigdo, and Ostling (2017) study the effect of lotteries on players' own health and child development in Sweden.

Second, we contribute to the literature on financial constraints and entrepreneurship. The previous literature has found mixed evidence. Evans and Jovanovic (1989), Evans and Leighton (1989), and Holtz-Eakin, Joulfaian, and Rosen (1994) find a strong positive correlation between entrepreneurial wealth and the likelihood of starting a business. In addition, Adelino, Schoar, and Severino (2015) and Schmalz, Sraer, and Thesmar (2017) show the importance of real estate collateral to entrepreneurial activity. However, Hurst and Lusardi (2004) challenge these findings and argue that the correlation between wealth and firm creation only reflects the preferences or opportunities of a group of individuals. Our paper adds to this literature by studying income shocks (the randomized assignments of monetary prizes provided by a syndicated lottery) instead of wealth. Two key aspects of the Spanish Christmas Lottery – it is a social event and an income shock to households in the same geographic area – make our setting unique to study how changes in economic conditions and individual wealth affect entrepreneurial activities.

Finally, our paper contributes to the literature on the link between economic activity and firm creation (e.g., Koellinger and Thurik (2012)). Our paper shows that firm creation responds to local demand shocks that generate growth opportunities. Our contribution is to provide causal evidence that local economic conditions affect entrepreneurship.

2 Data

2.1 Christmas Lottery Background

The Spanish Christmas Lottery (*Lotería del Gordo*) is a national lottery game that has been held since 1812. Nowadays, this lottery is held every year on December 22 and is considered the biggest lottery game worldwide. Compared with more than 500 lotteries held every year in

Spain, the Christmas lottery represents one-fifth of total lottery sales. About three-quarters of the population participate in the Christmas lottery, 80% of the individuals are between 25 and 44 years old with college degree, and around 70% of them are newcomers, people who only play the lottery in Christmas. The amount of money spend by individuals are quite homogeneous, with 70% of individuals spending less than 60 euros and only about 8.5% planning to spend more than 150 euros.

The tickets have five-digit numbers. There were 66,000 numbers played until 2004 and 85,000 between 2005 and 2010. The numbers played have raised to 100,000 since 2011. Each number is generally sold by one lottery outlet, and the numbers that are allocated to each outlet are randomly assigned using a computer. Each number is divided into 165 series, and each of these series consist of 10 fractions that can be also divided into smaller shares. The price of a fraction is 20 euros, so the cost of buying a whole number is 33,000 euros since 2011. People tend to buy one fraction (20 euros) but they can also buy a share of 5 and 2 euros. Thus, depending on the number of shares sold, there might be between 1,650 and 16,500 ticket holders for each number.

The amount of money assigned to prizes is 70% of the money collected (i.e., 2,320 million euros). The remaining 30% is distributed as commissions for outlet, internal revenue, and to cover administration costs. For the top three prizes, the holders of the first prize get 20,000 euros per euro played, the second prize awards winners with 6,250 euros, and the third prize awards winners with 2,500 euros. Given that the standard ticket costs 20 euros, a first prize winner will receive an income shock of 400,000 euros.¹

2.2 Data

We merge the Christmas Lottery data with firm-level data from the Amadeus and Sabi databases. Amadeus is a commercial pan-European database provided by Bureau van Dijk,

¹These prizes were 10,000 euros, 4,800 euros, and 2,400 euros per euro played between 1986 and 2004; and 15,000, 5,000, and 2,500 between 2005 and 2011. All the Christmas lottery prizes were tax exempt until 2013, in which a 20% tax was imposed for prizes larger than 2,500 euros. See [Bagues and Esteve-Volart \(2016\)](#) for more details about the Christmas lottery players' characteristics.

containing financial information on over 2.5 million public and private companies in Spain. The database contains detailed firm-level characteristics and financial data. In addition, Amadeus also provides information on year of incorporation, industry (the three-digit NACE code—the European standard of industry classification) and the province where the firm is located. The other source of information is the Sabi database, an enhanced version of Amadeus for Spain. Sabi is especially useful because it covers a larger fraction of new and SMEs across all industries, and contains information not only on active firms, but also on firms that have been already liquidated.²

We also obtain information on macroeconomic variables at the province level such as population, inflation rate, labor force participation, unemployment rate, house prices, bank loans, and gross domestic product (GDP) per capita from 1992 to 2015. The data on population, inflation rate, labor force participation, and GDP are from INE, data on outstanding loans are from the Statistics Bulletin of the Bank of Spain, and data on house prices are from different sources: ST Sociedad de Tasación (the largest independent Real Estate Valuation firms in Spain), Idealista and Fotocasa (the two largest real state portals in Spain). Moreover, we obtain data on self-employed individuals and their characteristics from the Ministry of Labor and Social Security.

2.3 Summary Statistics

Table 1 presents summary statistics for the Christmas lottery and macroeconomic variables at the province level. Panel A summarizes the Christmas lottery expenditure, number of tickets sold and prizes by province. The average yearly expenditure per capita in a province is 57 euros. On aggregate, this represents about 0.29% of the GDP of that province. The average top three lottery prizes are 21 euros per capita or about 0.10% of the GDP at the province

²We also use data aggregated at the province level from the Spanish Central Directory of Enterprises (Directorio Central de Empresas, DIRCE). This data is compiled by the Spanish National Statistics Office (Instituto Nacional de Estadística, INE). INE does not provide individual firm-level data, the information provided is aggregated by province and year, for groups of firms in a given range of firm characteristics. DIRCE is the first official database on individual firms for the Spanish economy, which covers the entire population of existing firms. We use this data in the appendix as robustness tests because given the aggregation of this data, only limited analysis can be implemented.

level. While we observe the geographical distribution of the top three prizes, which account for about three-quarters of the total prizes, we cannot observe the remaining small prizes that are awarded by the lottery. Thus, we consider the top three lottery prizes in our analysis. Given the random nature of the prizes, we can assume that their geographical distribution is proportional to the expenditure by province. Panel B of Table 1 reports summary statistics for provinces that were awarded the maximum prize per capita in each year during our sample period. We proceed in this way to gauge the largest liquidity effect on our sample. The average lottery prize received by a winning province is equivalent to about 3.5% of province-level GDP and about 750 euros per capita. The number of tickets sold in winning provinces is about 1,500, approximately one for every 800 individuals. Because these fractions tend to be split in smaller shares (a fourth or a tenth), this figure should be considered as a lower bound of the number of individuals receiving lottery prizes. Panel C describes average macroeconomic characteristics of the provinces during our sample period. The average province has 861,000 inhabitants, a 17% unemployment rate, 2.8% inflation rate, and a GDP per capita of almost 20,000 euros.

Table 2 summarizes the average number of firms across provinces, and by sector. Moreover, statistics on new firms are also reported by province and sector. Finally, information on firm growth (net entry rate), entry rate (new firms) and exit rate are reported. On average, there are 15,736 firms per province and year, from which 1,871 are non-tradable firms and 136 are newly created non-tradable firms.

Table 3 reports average characteristics for new firms. Firm characteristics reported are size (assets), total employment, value added, debt to assets ratio, the Z-Score and wages. Table 4 reports summary statistics for self-employed individuals. Information on sex, age, nationality, number of employees, pluriactivity and sector is reported.

3 Entrepreneurial Activity and the Christmas Lottery

3.1 Net Firm Entry

We examine the effect of the Christmas Lottery income shock (i.e., prize) on entrepreneurship. Our baseline specification employs a difference-in-differences (DD) estimator that compares firm creation in provinces that receive the lottery prize (treatment group) relative to provinces that do not receive the lottery prize (control group). The sample consists of province-level data in the 1992-2015 period.

The province-level specification we use is as follows:

$$\Delta Firms_{i,t} = \beta TopPrize_{i,t-1} + \theta Expenditure_{i,t-1} + \gamma Z_{i,t-1} + \delta_i + \eta_t + \varepsilon_{i,t} \quad (1)$$

where $\Delta Firms_{i,t} = (Firms_t - Firms_{t-1})/Firms_{t-1} \times 100$ is the growth rate (in percentage) of the number of firms in province i between $t - 1$ and t (net entry rate); $TopPrize_{i,t-1}$ is a dummy variable that takes a value of one if the top prize was awarded in province i in year $t - 1$, and zero otherwise.³ $Expenditure_{i,t-1}$ is the expenditure per capita in lottery in year $t - 1$ in province i ; $Z_{i,t-1}$ include GDP per capita growth, inflation growth, unemployment growth, house prices growth, population growth, and bank loans growth.⁴ δ_i is a province fixed effect and η_t is a time (year) fixed effect. The coefficient of interest β measures the average difference in net entry rate between winning provinces and nonwinning provinces. Since province fixed-effects are included to control for heterogeneous unobserved factors, what we observe is within-province variation.

Table 5 shows the results. We find a positive and significant effect of the lottery prize on the net entry rate in winning provinces relative to non-winning provinces. The increase in the number of firms can occur because more firms are created, or because less firms are liquidated. We analyze firm entry and exit rates subsequently.

³Lottery is awarded on December 22nd of year t , but disbursed a few days later on January of year $t + 1$.

⁴All values are measured as of December. Growth is measured as the change between year $t - 1$ and year $t - 2$.

The regression in column (1) only controls for lottery expenditure and year fixed effects. The coefficient of interest β is 0.69. This indicates that the growth rate of the number of firms in winning provinces is 0.69 percentage points higher than in non-winning provinces. Given that the average net entry rate is 6% in our sample period, the effect of the lottery prize represents more than 10% of the average. Results are robust to the inclusion of additional control variables (column (2)), province fixed effects (column (3)), and regressions weighted using population as weights (column (4)). In particular, column (3) includes province fixed effects, which controls for unobserved time-invariant province heterogeneity and the estimator is driven by within-province variation. In column (5), results are also robust when we drop Madrid and Lleida from the sample, which are provinces with special characteristics.⁵

3.2 Firm Entry and Exit

We analyze the effect of the lottery prize on firm entry and exit rates. The sample period is from 1992 to 2015.

The province-level specification we use is as follows:

$$Y_{i,t} = \beta TopPrize_{i,t-1} + \theta Expenditure_{i,t-1} + \gamma Z_{i,t-1} + \delta_i + \eta_t + \varepsilon_{i,t} \quad (2)$$

where $Y_{i,t}$ is the entry rate or exit rate (in percentage). The entry rate is the number of firms created in year t divided by the number of firms in year $t - 1$. The exit rate is the number of firms that exit in t divided by the number of firms in year $t - 1$. $TopPrize_{i,t-1}$ is a dummy variable that takes a value of one if province i received the maximum prize per capita in year $t - 1$, and zero otherwise.

Table 6 presents the estimates of the effect of the lottery prize on the entry rate and exit rate. Column (1) shows that the $TopPrize$ coefficient is positive and significant in the entry rate regression. The results indicate that the entry rate increases by 0.67 percentage points in

⁵Madrid is the capital and biggest city in Spain, it can exhibit special features such as more lottery expenditure and more economic activity. The province of Lleida has a city called Sort that has a strong Christmas lottery tradition and spends a high amount in this lottery (around 3% of total sales).

winning provinces relative to non-winning provinces. We do not find a significant effect of the lottery prize on the exit rate, although the coefficient is negative. This negative coefficient indicates that firm exit is lower after the lottery award.

Alternatively, we use the lottery prize in euros per capita, in euros divided by GDP and the number of tickets awarded as main explanatory variables. Table 7 presents the effect of one standard deviation increase of these variables on entry and net entry rates. Column (4) indicates that if we give 186 euros (sd of Prizes pc) to each individual in a province, the net entry rate rises by 0.06 percentage points. Given that the number of firms in a province is 15,736 (see Table 2), this result indicates that for each 20 euros per capita awarded, the province will gain an additional firm.

3.3 Firm Creation Dynamics

In this section, we study the dynamics over time of the relation between the lottery prize and entrepreneurship. We use the specification in equation (1) with four lags and four leads of the dummy variable *TopPrize*. The dependent variable is the logarithm of the new firms.

Figure 1 shows the estimated β_n coefficients and corresponding 95% confidence intervals. We include 4 lags and 4 leads of the dummy variable *TopPrize*. The figure shows the differential entry rate around a lottery prize. We find a significant increase in the entry rate in the two years after the lottery when comparing awarded provinces to non-awarded provinces. In addition, we find that treatment and control groups follow parallel trends before the treatment, mitigating concerns about preexisting differential trends.

3.4 Financial Constraints

We conduct a series of tests of the hypothesis that financial constraints impair entrepreneurship. We analyze the effect of the lottery prize on firm entry for different sectors as classified by Mian and Sufi (2014). Specifically, we study the effect of the lottery prize on entrepreneurship in industries that depend more on local demand (non-tradable) and industries that depend less on local demand (tradable). If the effect of the lottery prize

on firm creation is a consequence of an increase in local demand, not an effect of financial constraints, the effect should be insignificant in tradable industries. In contrast, if financial constraints impair firm creation, we should also find an effect in the tradable sector. To analyze this hypothesis, we use equation (1) and estimate the relation between the lottery and the entry rate across different industries.

Table 8 shows that our estimate for the tradable sector is of similar magnitude to that of the full sample. In column (1), we find that the effect of the lottery on the entry rate is still positive and significant at 0.70 when we exclude the construction sector. We exclude the construction and the non-tradable sector in column (2) and also exclude the financial sector in column (3). The effect of the lottery on the entry rate is slightly reduced to 0.65 but it is still positive and significant. This implies that our results are not solely driven by firms in the non-tradable sector or in the construction sector. In column (5) we focus on the tradable sector, and in column (6) we focus on the manufacturing sector. If the effect of the lottery on firm creation is primarily driven by a local demand shock, then the coefficient should be significantly reduced when we focus on the tradable and manufacturing sectors. We find the the impact of the lottery on firm creation remains positive and significant in the tradable and manufacturing sectors at 0.66-0.69. This finding is consistent with financial constraints playing an important role in entrepreneurship.

Next, we analyze the role of bank loan supply on the effect of the lottery prize on entrepreneurship. We use equation (1) and split the sample into provinces with high and low bank loan supply based on the median amount of bank loans per capita by province, and on the amount of bank branches per capita by province. Table 9 shows that the *TopPrize* coefficients in the entry rate and net entry rate regressions are positive and significant for both samples, but the magnitude of the coefficients is significantly larger for the sample with low bank loan supply. These results indicate that the effect of the lottery prize on entrepreneurship is larger in provinces with lower access to credit. This result suggests that financial constraints play an important role in shaping the effect of the lottery prize on entrepreneurship. Similar results are obtained when focusing on bank branches per capita.

3.5 Firm Type and Capital Requirements

We now turn to study whether there are differences in the type of firms created after the lottery prize. We decompose the net entry rate according to firm type using equation (1).

To study the importance of financial constraints for firm creation, we use the variation in the amount of start-up capital needed to create a new firm (Hurst and Lusardi (2004) and Adelino, Schoar, and Severino (2015)). The minimal feasible scale of businesses differs across firm types. Self-employment and limited liability companies require little start-up capital, while a public limited company requires higher start-up capital, which are too high to be financed with lottery prizes.⁶

Table 10 shows the estimates by type of firms that are created following the lottery shock. We find that the lottery prize has a strong significant and positive effect in the entry rate and net entry rate for limited liability companies, i.e., in cases with lower start-up capital. This indicates that financial constraints are important to start a business, but the size of the lottery prize is not sufficiently large enough to meet the capital requirements of public limited companies. This result is consistent with the financial constraints hypothesis, smaller firms that require less capital to start are those that benefit the most from the lottery prize. The effect on the creation of limited liability companies is also positive and weakly significant for the entry rate.

Moreover, in Table 11 we study the effect of the lottery on firm creation by splitting the number of firms according to the median initial capital requirements. We find a stronger effect of the lottery on firm growth in the lower initial capital requirements sample.

3.6 Firm Survival and Characteristics

In this section we study whether the lottery prize affects firm survival, and we analyze the characteristics of new firms. We first examine the probability that a newly created firm survives more than 1, 2, 3 or 5 years. Our main econometric specification is based on a logit

⁶In Spain, the minimum capital required to start a limited liability company is 3,000 euros while it is 60,000 euros to start a public limited company.

model of the following type:

$$Y_{i,t} = \beta Treatment_{i,t-1} + \theta Expenditure_{i,t-1} + \gamma Z_{i,t-1} + \delta_i + \eta_t + \varepsilon_{i,t} \quad (3)$$

where $Y_{i,t}$ is a dummy variable equal to one if the firm survives for 1, 2, 3 or 5 years and zero otherwise; $Treatment_{i,t-1}$ is a dummy variable that takes a value of one for new firms incorporated in provinces awarded with the maximum prize per capita in the previous year, and zero otherwise; $Expenditure_{i,t-1}$ is the expenditure per capita in lottery in year $t - 1$ in province i ; $Z_{i,t-1}$ include GDP per capita growth, inflation growth, unemployment growth, house prices growth, population growth, and bank loans growth in province i .

In Table 12 we find that firms created in lottery awarded provinces have a higher probability of survival for more than 3 or 5 years. Moreover, when we exclude firms that are more dependent on local demand (firms in the non-tradable sector and in the construction sector), we still find that firms created in awarded provinces have a higher probability of surviving more than 3 or 5 years.

We also perform tests on firm characteristics of new firms. For this purpose, in this analysis we only use data of new firms in their first years of life. The firm-level specification we use is as follows:

$$Y_{j,i,t+n} = \beta Treatment_i + \theta Expenditure_{i,t-1} + \gamma Z_{i,t-1} + \delta_i + \eta_t + \varepsilon_{j,i,t+n} \quad (4)$$

where $Y_{j,t+n}$ is a characteristic of firm j in province i in year $t + n$, and $Treatment$ is a dummy variable that takes a value of one for new firms incorporated in provinces awarded with the maximum prize per capita in the previous year, and zero otherwise. By including province fixed effects δ_i , we control for unobserved province heterogeneity by performing a within-province analysis. Thus, we compare the characteristics of new firms created in the same province. As an example, we are comparing the characteristics of new firms created in Madrid the year after the lottery, with the characteristics of new firms created in Madrid in

other periods.

The firm characteristics that we study are firm size (proxied by total assets), total employment, debt-to-assets ratio, value added (logarithm of $1 + \text{revenues} - \text{wages}$), wages and the Z-Score as a proxy for the probability of default.⁷ Table 13, Panel A, presents the estimates for years 1, 2, 3 and 5. We find that firms created after the lottery prize are bigger, exhibit higher value added and higher risk. In Panel B of Table 13 we observe that once we exclude firms that are more dependent on local demand (firms in the non-tradable and construction sector), firms created after the lottery prize are less indebted. Thus, firms that are not as dependent on local demand tend to use more capital as a financing source. This result suggests that the lottery prize helps to alleviate financial constraints and provide capital to start a business.

We also explore the effect of the lottery on the growth of assets, employment, sales, wages and leverage. We find that firms created in provinces awarded with the lottery exhibit higher wages growth and leverage growth. However, once we exclude firms in the non-tradable and construction sector, we find that these firms also exhibit higher employment and sales growth. These results seem to show that firms created in sectors that do not rely on local demand are of better quality.

3.7 Self-employed Individuals

In this section we focus on the effect of the lottery on the growth of self-employed individuals and their characteristics. For this purpose, we use data from the Ministry of Labor and Social Security. Following the same structure used in Table 5 and the same specification as in equation (1), we show in Table 15 that there is a positive and significant increase of self-employed individuals in provinces awarded with the top lottery prize per capita.

Again, following the same specification as in equation (1), we analyze the effect of the lottery prize on the characteristics of self-employed individuals. The dependent variable is

⁷We measure the Z-Score as $0.717 \times \text{Working Capital}/\text{Assets} + 3.107 \times \text{EBIT}/\text{Assets} + 0.42 \times \text{Equity}/\text{Assets} + 0.998 \times \text{Revenues}/\text{Assets}$.

the growth rate from t to $t-1$ of the number of self-employed classified by sex, age, nationality, pluriactivity, number of employees hired and sector. In Table 16, we show that the effect of the lottery prize is especially significant for self-employed individuals with the following characteristics: male, national (from Spain), with employees, without pluriactivity and in the services sector.

4 Conclusion

Entrepreneurship is a key driver of economic growth and job creation. In this paper we exploit a randomized income shock – the Spanish Christmas lottery – to identify the causal effect of economic conditions and liquidity constraints on entrepreneurship. We show that winning provinces experience a differential effect on firm creation relative to non-winning provinces. We find that firm creation is more pronounced in self-employment and small businesses, and is driven by firm entry, rather than a reduction in firm exit.

The driver of firm creation is not only the aggregate demand channel. We find evidence of a differential effect on firm creation in the tradable sector, which is less dependent on local demand. In addition, we find that the lottery prize effect is stronger in provinces with lower bank lending supply, and that firms created in tradable industries are more equity-financed and have higher survival rates. These findings are consistent with the financial constraints channel.

Our results suggest that the increase in entrepreneurial activity in response to local income shocks is driven by both an increase in investment opportunities and a reduction in individual financial constraints.

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Table 1: Summary Statistics of Lottery and Macroeconomic Variables

This table reports summary statistics (mean, standard deviation, 25th-percentile, median and 75th-percentile) on the main analysis sample. Panel A describe the Christmas lottery for the period 1992-2015 for the 50 Spanish provinces. Panel B provides lottery information for the province awarded with the top Lottery prize. Panel C describes macroeconomic variables at the province level. All monetary variables are in constant 2010 euros.

	Unit	Mean	Standard Deviation	25%	Median	75%	Obs
Panel A: Lottery per Provinces							
Expenditure per Capita	EURs	56.82	27.92	40.01	52.65	67.74	1200
Prizes per Capita	EURs	21.28	186.33	0.00	0.00	0.68	1200
Number Winning Tickets	Number	91.30	346.89	0.00	0.00	10.00	1200
Expenditure per GDP	%	0.29	0.11	0.22	0.28	0.35	1200
Prizes per GDP	%	0.10	0.83	0.00	0.00	0.00	1200
Number Winning Tickets pc	%	0.03	0.19	0.00	0.00	0.00	1200
Panel B: Lottery in Provinces with Maximum Prizes per capita							
Expenditure per Capita	EURs	76.49	41.39	46.72	63.17	94.58	24
Prizes per Capita	EURs	747.82	1093.59	183.77	361.68	644.96	24
Number Winning Tickets	Number	1489.54	835.21	1060.00	1375.00	1830.50	24
Expenditure per GDP	EUR000s	0.34	0.15	0.23	0.32	0.40	24
Prizes per GDP	%	3.43	4.79	0.88	1.52	3.60	24
Number Winning Tickces pc	%	0.70	0.87	0.16	0.24	0.88	24
Prize per Ticket	%	216.28	94.96	133.83	235.76	279.97	24
Panel C: Macroeconomic Variables							
GDP per capita	EUR000s	19.58	4.86	15.99	18.85	22.68	1200
Housing Price	EURm2	1205.37	579.80	751.95	1095.34	1528.41	1200
Inflation Rate	%	2.80	1.69	1.89	3.00	3.82	1200
Unemployment Rate	%	16.90	8.12	10.35	15.77	21.97	1200
Population	000s	861.59	1046.42	349.77	564.20	973.29	1200
Outstanding Loans per capita	EUR000s	18.32	9.98	10.04	16.23	24.93	1176
Bank Branches (x1000) pc	Number	1.01	0.28	0.81	0.96	1.18	1200

Table 2: Summary Statistics of Number of Firms

This table reports summary statistics (mean, standard deviation, 25th-percentile, median and 75th-percentile) on the number of firms in a province, by different classifications. It also includes the annual entry, exit and net entry rate of firms in a province.

	Firm classification 1992-2015					
	Mean	Standard Deviation	25%	Median	75%	Obs
Total Firms	15736	26505	3891	8031	16061	1200
Non-Tradable Firms	1871	2732	486	1050	2054	1200
Construction Firms	4995	8485	1102	2394	5281	1200
Tradable Firms	1646	2502	507	938	1701	1200
New Firms	1039	1683	293	552	1074	1200
New Non-Tradable Firms	136	183	44	80	157	1200
New Construction Firms	320	542	73	150	335	1200
New Tradable Firms	80	116	25	47	83	1200
Net Entry Rate (%)	6	8	1	8	11	1150
Entry Rate (%)	9	5	4	8	12	1150
Exit Rate (%)	3	4	0	1	2	1150

Table 3: Summary Statistics of Firm Characteristics

This table reports summary statistics (mean, standard deviation, 25th-percentile, median and 75th-percentile) on firm characteristics. The sample includes all the new firms created during the period 1992-2015. Firm characteristics are size (log of 1 + total assets), employment (log of 1 + number of employees), value-added (log of total sales - outside purchases of materials and services), leverage (debt to assets), risk (Z-score), and wages (log of 1 + cost of employees) during the firm first year of life.

	Firm Characteristics 1992-2015					
	Mean	Standard Deviation	25%	Median	75%	Obs
Size	11.09	1.86	9.85	11.07	12.23	392682
Employment	1.26	0.70	0.69	1.10	1.61	184252
Value Added	10.99	1.62	10.05	11.06	12.01	130231
Debt to Assets	0.52	0.68	0.22	0.48	0.75	71062
Z-score	1.61	9.67	0.26	1.25	2.72	173824
Wages	9.82	1.42	8.89	9.87	10.76	249284

Table 4: Summary Statistics of Self-Employed Individuals

This table reports summary statistics (mean, standard deviation, 25th-percentile, median and 75th-percentile) on the characteristics of the entrepreneurial activity. The table reports the total number of individuals, the gender, age, nationality, number of employees hired, activity and sector. The sample includes the existing number of self-employees during the period 2005-2015, aggregated at the province level.

	Entrepreneurs 2005-2015					
	Mean	Standard Deviation	25%	Median	75%	Obs
Total	41075	43387	18592	30158	44643	600
Male	27697	29707	12923	20369	29227	600
Female	13377	13928	5766	10065	14532	600
Age < 25	861	922	319	617	988	600
Age 25-39	12162	13782	4903	8603	13316	600
Age 40-54	18130	18617	8176	13633	19914	600
Age >54	9922	10335	4963	7509	11104	600
National	38366	39343	17967	29025	40599	600
Foreigner	2709	4635	479	956	2448	600
w/o employees	32974	35267	15327	24729	35479	600
w/ employees	8101	8298	3291	5439	9994	600
w/o pluriactivity	39184	41047	17664	28707	42841	600
w/ pluriactivity	1890	2409	824	1276	1963	600
Agriculture Sector	5669	3838	3126	4803	6649	600
Manufacturing Sector	2183	2609	936	1463	2461	600
Construction Sector	5105	5870	2236	3358	5827	600
Service Sector	28119	35401	10568	18756	31202	600

Figure 1: Average Firm Creation Around a Lottery Prize

This figure shows point estimates and 95% confidence intervals of the effect on the entry rate of winning provinces relative to non-winning provinces. The dependent variable is the logarithm of new firms per province. The main explanatory variables are Top Prize_{t-4} , Top Prize_{t-3} , Top Prize_{t-2} , Top Prize_{t-1} , Top Prize_{t+1} , Top Prize_{t+2} , Top Prize_{t+3} , and Top Prize_{t+4} , dummy variables that take a value of one if a given province has the maximum prize per capita in year $t-4$, $t-3$, $t-2$, $t-1$, $t+1$, $t+2$, $t+3$ and $t+4$, and zero otherwise. The regression controls for the total expenditure in the Christmas Lottery per capita, GDP growth per capita, and the provincial growth of the average housing price (per square meter), inflation, unemployment and population. Province and year fixed effects are included. The sample covers the period 1992-2015.

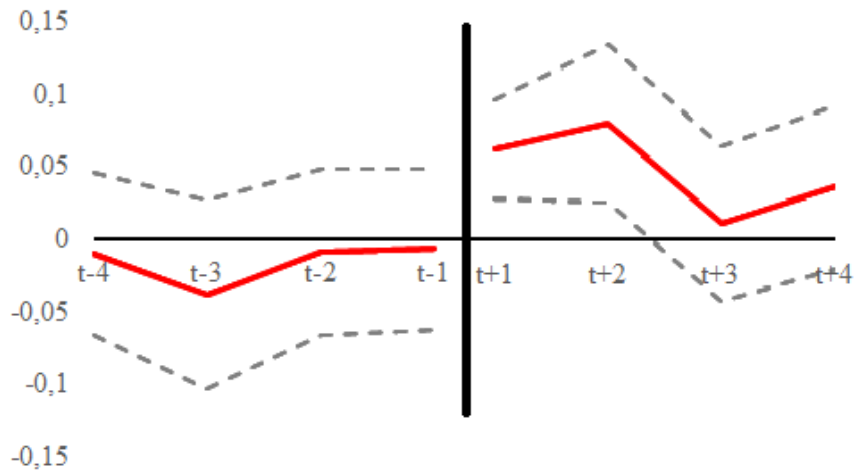


Table 5: The Effect of Lottery Prizes on Firm Creation

This table presents estimates of regressions of the growth (Net Entry) rate of the number of firms between year t and $t-1$. Top Prize $_{t-1}$ is a dummy variable that takes a value of one if a given province has the maximum prizes per capita in year $t-1$, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita, GDP growth per capita, and the provincial growth of the average housing price (per square meter), inflation, unemployment and population. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Net Entry Rate				
	(1)	(2)	(3)	(4)	(5)
Top Prize $_{t-1}$	0.687** (2.38)	0.706** (2.42)	0.955*** (3.75)	0.495** (2.03)	0.836** (2.52)
Expenditure pc $_{t-1}$	-5.119 (-1.26)	-4.304 (-1.13)	2.027 (0.32)	-14.610* (-1.88)	-6.740* (-2.01)
Δ GDP pc $_{t-1}$		0.017 (0.70)	0.031 (1.40)	0.010 (0.27)	0.013 (0.48)
Δ Housing Price $_{t-1}$		0.017** (2.19)	0.005 (0.62)	0.016 (1.40)	0.020** (2.48)
Δ CPI $_{t-1}$		-0.119 (-0.46)	0.123 (0.63)	-0.487 (-0.99)	-0.143 (-0.53)
Δ Unemployment $_{t-1}$		-0.034 (-1.57)	-0.051** (-2.30)	-0.050 (-1.59)	-0.029 (-1.36)
Δ Population $_{t-1}$		0.190* (1.91)	0.450*** (4.85)	0.182* (1.90)	0.174* (1.71)
Year FE	Y	Y	Y	Y	Y
Province FE	N	N	Y	N	N
Population weights	N	N	N	Y	N
Sample	Full Sample	Full Sample	Full Sample	Full Sample	Excl. Madrid & Lleida
Observations	1150	1150	1150	1150	1104
Adjusted R2	0.948	0.949	0.959	0.953	0.950

Table 6: The Effect of Lottery Prizes on Firm Entry and Exit Rates

This table presents estimates of regressions of the firm entry and exit rate between year $t-1$ and t . Top Prize $_{t-1}$ is a dummy variable that takes a value of one if a given province has the maximum prizes per capita in year $t-1$, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Entry Rate		Exit Rate	
	(1)	(2)	(3)	(4)
Top Prize $_{t-1}$	0.670** (2.27)	0.861*** (3.55)	-0.036 (-0.24)	-0.095 (-0.72)
Expenditure pc $_{t-1}$	-9.438*** (-2.77)	-3.934 (-0.66)	-5.134*** (-2.98)	-5.961 (-1.36)
Δ GDP pc $_{t-1}$	0.005 (0.20)	0.013 (0.64)	-0.013 (-1.36)	-0.018* (-1.88)
Δ Housing Price $_{t-1}$	0.013** (2.05)	0.006 (0.87)	-0.004 (-0.84)	0.001 (0.11)
Δ CPI $_{t-1}$	-0.191 (-0.83)	0.067 (0.37)	-0.071 (-1.23)	-0.056 (-1.21)
Δ Unemployment $_{t-1}$	-0.054*** (-3.30)	-0.065*** (-3.80)	-0.020* (-1.92)	-0.014 (-1.40)
Δ Population $_{t-1}$	0.237** (2.48)	0.288*** (3.47)	0.048 (1.66)	-0.162*** (-3.23)
Time FE	Y	Y	Y	Y
Province FE	N	Y	N	Y
Observations	1150	1150	1150	1150
Adjusted R2	0.897	0.920	0.957	0.962

Table 7: The Effect of Lottery Prizes on Firm Entry and Net Entry Rates: Alternative Explanatory Variables

This table presents estimates of regressions of the firm entry, and net entry rate of the number of firms between year $t-1$ and t . Prize pc_{t-1} is the amount of lottery prizes per capita in each province (in euros thousands) in year $t-1$; Prize gdp_{t-1} is the amount of lottery prizes per GDP in each province (in %) in year $t-1$; and Awarded Tickets pc_{t-1} is the number of winning tickets (in thousands) per capita in each province in year $t-1$. These three main explanatory variables are standardized with zero mean and standard deviation of 1. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Entry Rate			Net Entry Rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Prize pc_{t-1}	0.041** (2.17)			0.059** (2.56)		
Prize gdp_{t-1}		0.046** (2.21)			0.063** (2.35)	
Awarded Tickets pc_{t-1}			0.055*** (3.02)			0.053 (1.10)
Expenditure pc_{t-1}	-4.097 (-0.66)	-4.066 (-0.65)	-4.531 (-0.74)	1.874 (0.29)	1.911 (0.29)	1.419 (0.23)
Δ GDP pc_{t-1}	0.011 (0.56)	0.011 (0.57)	0.012 (0.59)	0.029 (1.32)	0.029 (1.32)	0.029 (1.34)
Δ Housing Price pc_{t-1}	0.006 (0.89)	0.006 (0.89)	0.006 (0.90)	0.006 (0.63)	0.006 (0.63)	0.006 (0.64)
Δ CPI pc_{t-1}	0.078 (0.43)	0.078 (0.43)	0.075 (0.42)	0.135 (0.69)	0.135 (0.69)	0.133 (0.68)
Δ Unemployment pc_{t-1}	-0.065*** (-3.74)	-0.065*** (-3.76)	-0.064*** (-3.71)	-0.050** (-2.28)	-0.051** (-2.29)	-0.049** (-2.25)
Δ Population pc_{t-1}	0.288*** (3.43)	0.289*** (3.43)	0.290*** (3.44)	0.450*** (4.77)	0.450*** (4.77)	0.452*** (4.78)
Time FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Observations	1150	1150	1150	1150	1150	1150
Adjusted R2	0.920	0.920	0.920	0.959	0.959	0.959

Table 8: The Effect of Lottery Prizes on Firm Entry by Sector

This table presents estimates of regressions of the firm entry rate between year $t-1$ and t . Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. Column 1 shows the results when we exclude firms in the construction sector, Column 2 excludes both construction and non-tradable industries, Column 3 also excludes financial firms, Column 4 includes only firms in the non-tradeable sector, Column 5 has firms in industries that are classified as tradable following Mian and Sufi(2014), and Column 6 only manufacturing industries. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Excl. const. (1)	Excl. const. and non-trad. (2)	Excl. const., non-trad. and fin. (3)	Non-Tradables (4)	Tradables (5)	Manufacturing (6)
Top Prize $_{t-1}$	0.701** (2.40)	0.698** (2.14)	0.654** (2.04)	0.724** (2.04)	0.694* (1.87)	0.660** (2.22)
Expenditure pc $_{t-1}$	-7.233 (-1.17)	-6.901 (-1.11)	-6.756 (-1.09)	-10.470 (-1.41)	-0.613 (-0.08)	0.101 (0.01)
Δ GDP pc $_{t-1}$	-0.006 (-0.28)	-0.006 (-0.29)	-0.006 (-0.27)	-0.002 (-0.06)	-0.023 (-0.88)	-0.022 (-0.87)
Δ Housing Price $_{t-1}$	0.001 (0.18)	0.002 (0.23)	0.002 (0.23)	0.001 (0.19)	-0.003 (-0.47)	-0.006 (-0.89)
Δ CPI $_{t-1}$	0.035 (0.20)	0.054 (0.31)	0.047 (0.27)	-0.017 (-0.07)	-0.139 (-0.72)	-0.224 (-1.10)
Δ Unemployment $_{t-1}$	-0.051*** (-3.33)	-0.050*** (-3.06)	-0.049*** (-3.03)	-0.055** (-2.21)	-0.031* (-1.72)	-0.028 (-1.35)
Δ Population $_{t-1}$	0.252*** (3.22)	0.225*** (2.84)	0.223*** (2.85)	0.364*** (3.69)	0.225** (2.49)	0.264** (2.52)
Time FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Observations	1150	1150	1150	1150	1150	1150
Adjusted R2	0.923	0.913	0.913	0.887	0.869	0.861

Table 9: The Effect of Lottery Prizes on Firm Creation: The Role of the Banking System

This table presents estimates of regressions of the firm entry rate between year $t-1$ and t . Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. In Panel A, we split provinces into low and high loan supply. In columns 1 and 2 the group of low bank loan supply consists of provinces with below-median bank loans per capita, and in columns 3 and 4 the group of high bank loan supply consists of provinces with above-median bank loans per capita. In Panel B, we split provinces into low and high levels of bank branches. In columns 1 and 2 the group of low bank branches consists of provinces with below-median number bank branches per capita, and in columns 3 and 4 the group of high bank branches consists of provinces with above-median number of bank branches per capita. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Low Bank Loan Supply		High Bank Loan Supply	
	Entry Rate	Net Entry Rate	Entry Rate	Net Entry Rate
Top Prize $_{t-1}$	1.255*** (3.88)	1.344*** (3.60)	0.414** (2.37)	0.486** (2.16)
Expenditure pc $_{t-1}$	7.968 (0.81)	15.217 (1.61)	-9.355 (-1.48)	-6.033 (-1.02)
Δ GDP pc $_{t-1}$	0.051 (1.69)	0.065* (1.83)	0.002 (0.08)	0.027 (0.90)
Δ Housing Price $_{t-1}$	0.016** (2.17)	0.021** (2.36)	0.015 (1.43)	0.009 (0.61)
Δ CPI $_{t-1}$	0.164 (0.74)	0.281 (1.13)	-0.182 (-0.67)	-0.126 (-0.40)
Δ Unemployment $_{t-1}$	-0.037 (-1.65)	-0.036 (-1.23)	-0.073** (-2.64)	-0.041 (-1.22)
Δ Population $_{t-1}$	0.133 (0.88)	0.279* (1.77)	0.162** (2.35)	0.356*** (3.14)
Time FE	Y	Y	Y	Y
Province FE	Y	Y	Y	Y
Observations	575	575	575	575
Adjusted R2	0.932	0.962	0.933	0.965

	Low Bank Branches		High Bank Branches	
	Entry Rate	Net Entry Rate	Entry Rate	Net Entry Rate
Top Prize $_{t-1}$	1.053* (1.97)	1.148** (2.33)	0.556*** (3.03)	0.756*** (3.10)
Expenditure pc $_{t-1}$	-26.246 (-0.70)	-18.558 (-0.40)	-3.736 (-0.70)	0.382 (0.06)
Δ GDP pc $_{t-1}$	0.023 (0.92)	0.042 (1.58)	-0.019 (-0.83)	-0.007 (-0.29)
Δ Housing Price $_{t-1}$	0.017 (1.44)	0.002 (0.11)	-0.002 (-0.15)	0.001 (0.07)
Δ CPI $_{t-1}$	0.445** (2.06)	0.550** (2.34)	-0.268 (-0.99)	-0.247 (-0.90)
Δ Unemployment $_{t-1}$	-0.068*** (-2.95)	-0.042 (-1.41)	-0.040 (-1.55)	-0.026 (-0.81)
Δ Population $_{t-1}$	0.227* (1.96)	0.482*** (2.87)	0.371** (2.42)	0.455*** (3.23)
Time FE	Y	Y	Y	Y
Province FE	Y	Y	Y	Y
Observations	575	575	575	575
Adjusted R2	0.929	0.964	0.923	0.962

Table 10: The Effect of Lottery Prizes on Firm Creation by Legal Status

This table presents estimates of regressions of the firm entry rate and net entry rate between year $t-1$ and t , by their legal status (LLC and PLC). Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Limited Liability Company		Public Limited Company	
	Entry Rate	Net Entry Rate	Entry Rate	Net Entry Rate
Top Prize $_{t-1}$	0.835*** (3.09)	0.970*** (3.20)	0.224* (1.80)	-0.014 (-0.05)
Expenditure pc $_{t-1}$	-9.154 (-1.50)	-2.995 (-0.46)	4.299* (1.69)	7.213* (1.79)
Δ GDP pc $_{t-1}$	0.028 (1.10)	0.045 (1.60)	-0.001 (-0.13)	0.013 (1.05)
Δ Housing Price $_{t-1}$	0.013 (1.66)	0.012 (1.28)	-0.003 (-1.31)	-0.006 (-0.92)
Δ CPI $_{t-1}$	0.069 (0.31)	0.129 (0.54)	-0.044 (-0.67)	-0.039 (-0.44)
Δ Unemployment $_{t-1}$	-0.068*** (-3.22)	-0.050* (-1.90)	-0.016 (-1.66)	-0.024 (-1.49)
Δ Population $_{t-1}$	0.293*** (3.07)	0.466*** (4.45)	0.002 (0.04)	0.049 (0.70)
Time FE	Y	Y	Y	Y
Province FE	Y	Y	Y	Y
Observations	1150	1150	1150	1150
Adjusted R2	0.931	0.959	0.749	0.939

Table 11: The Effect of Lottery Prizes on Firm Creation: Industry Capital Requirements

This table presents estimates of regressions of the firm entry rate between year $t-1$ and t . Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. We split industries into low (below-average) and high (above average) initial capital requirements. We measure the initial capital requirements as the average initial capital of all the newly created firm in each two-digit industry code. We then obtain the entry rate of firms in these sectors in each province and year. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Low Initial Capital		High Initial Capital	
	(1)	(2)	(3)	(4)
Top Prize $_{t-1}$	0.456** (2.19)	0.591*** (3.56)	0.223* (1.92)	0.230** (2.55)
Expenditure pc $_{t-1}$	-7.643*** (-3.44)	-3.112 (-0.60)	-0.982 (-0.66)	-1.093 (-0.40)
Δ GDP pc $_{t-1}$	-0.017 (-1.07)	-0.009 (-0.72)	0.022** (2.58)	0.020** (2.49)
Δ Housing Price $_{t-1}$	0.002 (0.55)	-0.004 (-1.02)	0.010*** (2.96)	0.010*** (2.91)
Δ CPI $_{t-1}$	-0.187 (-1.23)	-0.079 (-0.69)	0.010 (0.10)	0.130 (1.37)
Δ Unemployment $_{t-1}$	-0.022* (-1.79)	-0.031** (-2.38)	-0.027*** (-3.18)	-0.028*** (-3.43)
Δ Population $_{t-1}$	0.024 (0.37)	0.188*** (3.19)	0.191*** (4.41)	0.072** (2.64)
Time FE	Y	Y	Y	Y
Province FE	N	Y	N	Y
Observations	1150	1150	1150	1150
Adjusted R2	0.884	0.915	0.834	0.875

Table 12: The Effect of Lottery Prizes on Firm Survival

This table presents the odd ratios of the probability that a newly created firm survives more than 1, 2, 3 and 5 years. *Treatment* is a dummy variable that takes a value of one for new firms incorporated in provinces awarded in the previous year with the top prize (treated firms), and zero (control firms) for new firms incorporated in provinces that did not win the lottery prize. We consider both all the firms of our sample, and excluding those in non-tradable and construction sectors. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	All Firms				Excl. non-trad. & cons.			
	Survivor>1	Survivor>2	Survivor>3	Survivor>5	Survivor>1	Survivor>2	Survivor>3	Survivor>5
Treatment	1.068 (0.28)	1.064 (0.86)	1.127** (2.48)	1.114** (2.48)	1.001 (0.00)	1.009 (0.07)	1.212*** (4.56)	1.120** (2.29)
Expenditure pc_{t-1}	0.000* (-1.86)	0.002 (-0.88)	0.002 (-1.45)	0.003** (-2.26)	0.000 (-1.27)	0.001 (-0.86)	0.000* (-1.84)	0.000*** (-3.91)
Δ GDP pc_{t-1}	0.988 (-0.53)	1.018 (1.40)	0.997 (-0.30)	0.997 (-0.34)	0.993 (-0.29)	1.011 (0.64)	0.990 (-0.80)	0.997 (-0.26)
Δ Housing Price $_{t-1}$	0.998 (-0.25)	0.997 (-1.22)	0.994*** (-2.61)	0.992** (-2.36)	1.006 (0.63)	0.997 (-0.83)	0.993** (-2.55)	0.994* (-1.70)
Δ CPI $_{t-1}$	1.071 (0.36)	1.247** (2.43)	1.115** (2.44)	1.094** (2.10)	1.090 (0.42)	1.244** (2.22)	1.029 (0.49)	1.107* (1.82)
Δ Unemployment $_{t-1}$	1.000 (-0.01)	1.010 (0.81)	1.007 (0.81)	0.996 (-0.54)	0.979 (-0.50)	1.018 (1.52)	1.020 (1.59)	1.005 (0.49)
Δ Population $_{t-1}$	1.061 (0.68)	1.010 (0.27)	1.054 (1.54)	1.010 (0.54)	1.171 (1.61)	1.025 (0.67)	1.066* (1.65)	1.027 (0.99)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	243352	245674	231067	175063	137527	132951	124179	94324
Pseudo R2	0.952	0.852	0.735	0.442	0.951	0.851	0.740	0.471

Table 13: The Effect of Lottery Prizes on Firm Outcomes

This table presents estimates of regressions of outcomes of newly created firms, during their first five years of life. Firm outcomes are size (log assets), employment (log of employees), risk (z-score), profitability (EBTA/Assets), and leverage (debt to assets). *Treatment* is a dummy variable that takes a value of one for new firms incorporated in provinces awarded with the top prize in the previous year (treated firms), and zero (control firms) for new firms incorporated in regions that did not win the top prize. Panel A includes all the firms of our sample, in Panel B we exclude firms created in the non-tradable and construction sector. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. All regressions include region and year fixed effects. Year and province fixed effects are included. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

Panel A: All Firms					
	Size				
	Year 1	Year 2	Year 3	Year 5	
Treatment	0.068*	0.055**	0.054**	0.076***	
	(1.76)	(2.14)	(2.44)	(2.84)	
Observations	392682	319760	239806	167055	
Adjusted R2	0.032	0.047	0.048	0.036	
	Employment				
	Year 1	Year 2	Year 3	Year 5	
Treatment	0.042**	0.031	0.022	0.074***	
	(2.56)	(1.49)	(1.07)	(3.31)	
Observations	184252	144653	107705	70100	
Adjusted R2	0.018	0.017	0.021	0.035	
	Debt/Assets				
	Year 1	Year 2	Year 3	Year 5	
Treatment	0.036	0.013	-0.034*	-0.074**	
	(1.63)	(1.38)	(-1.97)	(-2.22)	
Observations	71062	57344	44949	32420	
Adjusted R2	0.003	0.003	0.002	0.002	
	Value Added				
	Year 1	Year 2	Year 3	Year 5	
Treatment	0.060***	0.063***	0.064**	0.118***	
	(3.46)	(4.48)	(2.52)	(3.27)	
Observations	130231	110419	86078	57532	
Adjusted R2	0.028	0.033	0.022	0.024	
	Wages				
	Year 1	Year 2	Year 3	Year 5	
Treatment	0.019	0.020	-0.013	0.071***	
	(1.20)	(0.70)	(-0.58)	(3.38)	
Observations	249284	202570	152426	100338	
Adjusted R2	0.020	0.025	0.021	0.029	
	Z-score				
	Year 1	Year 2	Year 3	Year 5	
Treatment	-0.210**	-0.023	0.050	0.013	
	(-2.44)	(-0.33)	(0.58)	(0.20)	
Observations	173824	149972	116597	79096	
Adjusted R2	0.001	0.001	0.002	0.003	

Table 13 (cont.): The Effect of Lottery Prizes on Firm Outcomes

Panel B: Excl. Non-Tradable and Construction

	Year 1	Year 2	Size	Year 3	Year 5
Treatment	-0.004 (-0.09)	0.013 (0.46)		-0.004 (-0.15)	-0.003 (-0.14)
Observations	210822	170978		128661	88236
Adjusted R2	0.039	0.049		0.046	0.042
	Year 1	Year 2	Employment	Year 3	Year 5
Treatment	0.045* (1.99)	0.025 (1.05)		0.020 (1.05)	0.050** (2.22)
Observations	99385	77654		57932	38036
Adjusted R2	0.021	0.021		0.024	0.034
	Year 1	Year 2	Debt/Assets	Year 3	Year 5
Treatment	-0.014* (-1.82)	-0.003 (-0.18)		-0.089*** (-2.85)	-0.159*** (-3.59)
Observations	37290	29990		23368	16165
Adjusted R2	0.006	0.004		0.002	0.002
	Year 1	Year 2	Value Added	Year 3	Year 5
Treatment	0.059* (1.95)	0.036 (1.18)		0.091*** (3.87)	0.098*** (2.69)
Observations	71901	60817		47239	31603
Adjusted R2	0.033	0.038		0.026	0.029
	Year 1	Year 2	Wages	Year 3	Year 5
Treatment	0.025 (1.28)	0.005 (0.23)		-0.020 (-0.96)	0.023 (0.89)
Observations	136576	110717		83432	55266
Adjusted R2	0.022	0.032		0.030	0.033
	Year 1	Year 2	Z-score	Year 3	Year 5
Treatment	-0.228 (-1.52)	-0.126 (-0.66)		0.015 (0.14)	0.073 (0.84)
Observations	99046	85576		66101	44317
Adjusted R2	0.001	0.001		0.003	0.002

Table 14: The Effect of Lottery Prizes on Firm Real and Financial Outcomes

This table presents estimates of regressions of long term outcomes of newly created firms, during their first five years of life. Firm long term outcomes are the asset, employment, sales, wages (employment cost) and leverage (debt/asset) growth from the first to the fifth year of the firm's life. *Treatment* is a dummy variable that takes a value of one for new firms incorporated in provinces awarded with the top prize in the previous year (treated firms), and zero (control firms) for new firms incorporated in provinces that did not win the lottery prize. Panel A includes all the firms and in Panel B we exclude firms in the non-tradable and construction sector. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 1992-2015. Year and province fixed effects are included. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

Panel A: All Firms	Asset Growth	Employment Growth	Sales Growth	Wages Growth	Leverage Growth
Treatment	1.911 (0.86)	0.320 (1.52)	0.498 (1.48)	0.364*** (2.84)	4.172** (2.29)
Observations	167055	70100	119239	100338	125711
Adjusted R2	0.003	0.003	0.009	0.005	0.003

Panel B: Excl. non-trad & cons.	Asset Growth	Employment Growth	Sales Growth	Wages Growth	Leverage Growth
Treatment	1.953 (0.44)	0.692** (2.09)	0.842* (1.81)	0.664*** (3.19)	6.360* (1.93)
Observations	88236	38036	66546	55266	66610
Adjusted R2	0.003	0.003	0.010	0.004	0.004

Table 15: The Effect of Lottery Prizes on Entrepreneurial Activity

This table presents estimates of regressions of the growth (Net Entry) rate of the number of self-employees between year t and $t-1$. Top Prize $_{t-1}$ is a dummy variable that takes a value of one if a given province has the maximum prizes per capita in year $t-1$, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 2005-2015. Robust t -statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Net Entry Rate				
	(1)	(2)	(3)	(4)	(5)
Top Prize $_{t-1}$	0.528*	0.533**	0.805**	0.520***	0.664***
	(2.00)	(2.11)	(2.16)	(3.28)	(2.98)
Expenditure pc $_{t-1}$	-14.207***	-13.184***	22.411***	-12.872**	-16.334***
	(-3.90)	(-4.33)	(4.45)	(-2.31)	(-3.55)
Δ GDP pc $_{t-1}$		-0.002	0.022	0.029	-0.002
		(-0.11)	(1.21)	(1.06)	(-0.12)
Δ Housing Price $_{t-1}$		0.012***	0.020***	0.005	0.012***
		(2.89)	(4.69)	(0.74)	(3.12)
Δ CPI $_{t-1}$		-0.312	0.278	-0.073	-0.278
		(-1.31)	(1.18)	(-0.40)	(-1.17)
Δ Unemployment $_{t-1}$		-0.064*	-0.070**	-0.024	-0.068**
		(-2.01)	(-2.43)	(-0.53)	(-2.16)
Δ Population $_{t-1}$		0.320***	-0.254***	0.169	0.293**
		(2.76)	(-2.88)	(1.18)	(2.41)
Year FE	Y	Y	Y	Y	Y
Province FE	N	N	Y	N	N
Population weights	N	N	N	Y	N
Sample	ALL	ALL	ALL	ALL	Excl. Madrid & Lleida
Observations	550	550	550	550	528
Adjusted R2	0.662	0.678	0.812	0.753	0.679

Table 16: Lottery Prizes and Self-Employed Characteristics

This table presents estimates of regressions of the net entry of self-employees between year t-1 and t, aggregated by gender, nationality, age, activity and sector. Top Prize_{t-1} is a dummy variable that takes a value of one if a given province has the maximum prizes per capita in year t-1, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The sample covers the period 2005-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Gender		Nationality		Age			
	Male	Female	National	Foreigner	<25	25-39	40-54	>54
Top Prize _{t-1}	0.711** (2.28)	0.094 (0.88)	0.730** (2.42)	0.074 (0.64)	0.042 (0.68)	0.223 (1.40)	0.294 (1.63)	0.245** (2.18)
Observations	550	550	550	550	550	550	550	550
Adjusted R2	0.778	0.819	0.840	0.551	0.674	0.770	0.731	0.781

	Employees and Activity				Sector			
	w/o Employees	w/ Employees	w/o Pluriactivity	w/ Pluriactivity	Agriculture	Manufacturing	Construction	Services
Top Prize _{t-1}	0.256 (0.96)	0.548*** (2.70)	0.762** (2.13)	0.042 (0.79)	-0.062 (-0.71)	0.058** (2.35)	0.321 (1.64)	0.487*** (2.83)
Observations	550	550	550	550	550	550	550	550
Adjusted R2	0.632	0.507	0.794	0.691	0.798	0.669	0.713	0.703

Internet Appendix for

“Entrepreneurship and Economic Conditions: Evidence from Regional Windfall Gains”

Vicente J. Bermejo, Miguel A. Ferreira, Daniel Wolfenzon and Rafael Zambrana

This Internet Appendix reports the results of supplementary and robustness tests as described below:

- Table A1: The Effect of Lottery Prizes on Firm Entry and Exit Rates (II): Full population
- Table A2: The Effect of Lottery Prizes on Firm Entry and Exit Rates (III): Natural Log
- Table A3: The Effect of Lottery Prizes on Firm Net Entry by Sector
- Table A4: The Effect of Lottery Prizes on Firm Creation: The Role of Banking System (II)
- Table A5: The Effect of Lottery Prizes on the Local Economy
- Table A6: The Effect of Lottery Prizes on the Local Economy: Openness Ratio
- Table A7: The Effect of Lottery Prizes on Entrepreneurial activity: Alternative Explanatory Variables

Table A1: The Effect of Lottery Prizes on Firm Entry and Exit Rates (II): Full population

This table presents estimates of regressions of the firm entry and net entry rate between year $t-1$ and t , using the full population of firms provided by the Spanish National Statistics Institute. Top Prize $_{t-1}$ is a dummy variable that takes a value of one if a given province has the maximum prizes per capita in year $t-1$, and zero otherwise. Prize pc $_{t-1}$ is the amount of lottery prizes per capita in each province in year $t-1$; Prize gdp $_{t-1}$ is the amount of lottery prizes per GDP in each province in year $t-1$. Prize pc $_{t-1}$ and Prize gdp $_{t-1}$ are standardized with zero mean and std of 1. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The analysis sample covers the full population of Spanish firms during the 1995-2015 period. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Panel A - Entry Rate			Panel B - Net Entry Rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Top Prize $_{t-1}$	0.942** (2.52)			0.800** (2.03)		
Prize pc $_{t-1}$		0.076*** (4.40)			0.063*** (3.78)	
Prize gdp $_{t-1}$			0.079*** (3.63)			0.066*** (2.92)
Expenditure pc $_{t-1}$	28.669** (2.16)	28.579** (2.15)	28.621** (2.15)	25.527* (1.88)	25.446* (1.87)	25.484* (1.87)
Δ GDP pc $_{t-1}$	0.060* (1.74)	0.058* (1.70)	0.058* (1.70)	0.067* (1.82)	0.065* (1.78)	0.065* (1.79)
Δ Housing Price $_{t-1}$	0.023** (2.08)	0.023** (2.08)	0.023** (2.09)	0.019 (1.67)	0.019 (1.67)	0.019 (1.67)
Δ CPI $_{t-1}$	0.755** (2.04)	0.775** (2.09)	0.776** (2.10)	0.730* (1.78)	0.746* (1.83)	0.747* (1.83)
Δ Unemployment $_{t-1}$	-0.107*** (-3.67)	-0.107*** (-3.66)	-0.107*** (-3.68)	-0.109*** (-3.79)	-0.109*** (-3.78)	-0.109*** (-3.79)
Δ Population $_{t-1}$	0.411*** (3.81)	0.411*** (3.79)	0.411*** (3.80)	0.432*** (3.69)	0.433*** (3.68)	0.433*** (3.68)
Time FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Observations	1050	1050	1050	1050	1050	1050
Adjusted R2	0.915	0.915	0.915	0.911	0.910	0.910

Table A2: The Effect of Lottery Prizes on Firm Entry and Exit Rates (III): Natural Log

This table presents estimates of regressions of the firm entry and exit rate between year $t-1$ and t , and the natural logarithm of new firms and firm closures in year t . Top Prize_{t-1} is a dummy variable that takes a value of one if a given province has the maximum prizes per capita in year $t-1$, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The analysis sample covers the period 1992-2015 period. Robust t -statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Log(Entry)		Log(Exit)	
	(1)	(2)	(3)	(4)
Top Prize $_{t-1}$	0.377* (1.91)	0.070*** (3.25)	0.332* (1.70)	-0.038 (-0.53)
Expenditure pc $_{t-1}$	-7.810* (-1.84)	-0.553 (-0.55)	-6.952* (-1.76)	-2.583 (-1.14)
Δ GDP pc $_{t-1}$	0.033*** (3.40)	0.001 (0.43)	0.036*** (3.18)	0.002 (0.62)
Δ Housing Price $_{t-1}$	-0.009** (-2.02)	0.001 (1.54)	-0.011** (-2.24)	0.002 (1.47)
Δ CPI $_{t-1}$	0.211 (1.66)	0.010 (0.73)	0.212 (1.28)	-0.009 (-0.34)
Δ Unemployment $_{t-1}$	-0.021*** (-3.44)	-0.004* (-1.85)	-0.024*** (-3.55)	-0.002 (-0.54)
Δ Population $_{t-1}$	0.339*** (3.10)	0.022*** (2.89)	0.399*** (3.17)	0.013 (0.71)
Time FE	Y	Y	Y	Y
Province FE	N	Y	N	Y
Observations	1150	1150	1150	1150
Adjusted R2	0.260	0.978	0.752	0.975

Table A3: The Effect of Lottery Prizes on Firm Net Entry by Sector

This table presents estimates of regressions of the firm net entry rate between year t-1 and t. Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. Column 1 shows the results when we exclude construction industries, Column 2 excludes both construction and non-tradable industries, Column 3 also excludes financial industries, Column 4 includes only non-tradeable industries, Column 5 has industries that are classified as tradable in Mian and Sufi(2014), and Column 6 only manufacturing industries. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The analysis sample covers the period 1992-2015 period. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Excl. const. (1)	Excl. const. and non-trad. (2)	Excl. const., non-trad. and fin. (3)	Non-Tradables (4)	Tradables (5)	Manufacturing (6)
Top Prize _{t-1}	0.784** (2.49)	0.782** (2.24)	0.727** (2.11)	0.811** (2.32)	0.650* (1.91)	0.645* (1.81)
Expenditure pc _{t-1}	-0.259 (-0.05)	0.343 (0.06)	0.699 (0.13)	-4.001 (-0.49)	5.304 (0.69)	6.670 (0.92)
Δ GDP pc _{t-1}	0.015 (0.68)	0.015 (0.69)	0.016 (0.73)	0.011 (0.31)	0.011 (0.40)	0.017 (0.61)
Δ Housing Price _{t-1}	-0.001 (-0.18)	-0.001 (-0.11)	-0.001 (-0.14)	-0.001 (-0.11)	0.001 (0.10)	0.001 (0.10)
Δ CPI _{t-1}	0.124 (0.63)	0.140 (0.71)	0.135 (0.69)	0.089 (0.32)	-0.133 (-0.60)	-0.059 (-0.28)
Δ Unemployment _{t-1}	-0.034* (-1.72)	-0.033 (-1.50)	-0.031 (-1.46)	-0.038 (-1.46)	-0.028 (-1.02)	-0.024 (-0.94)
Δ Population _{t-1}	0.406*** (4.71)	0.370*** (4.38)	0.375*** (4.47)	0.539*** (4.94)	0.391*** (3.38)	0.347*** (3.47)
Time FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Observations	1150	1150	1150	1150	1150	1150
Adjusted R2	0.960	0.956	0.956	0.940	0.922	0.929

Table A4: The Effect of Lottery Prizes on Firm Creation: The Role of Banking System (II)

This table presents estimates of regressions of the firm entry rate between year $t-1$ and t . Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. In columns 1-2 the group of low bank loans per branches consists of provinces with below-median number loans per bank branches. In columns 3-4 the group of high bank loan per branches consists of provinces with above-median number of loans per bank branches. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The analysis sample covers the period 1992-2015 period. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Low Bank Loans Per Branches		High Bank Loans Per Branches	
	Entry Rate	Exit Rate	Net Entry Rate	Entry Rate
Top Prize $_{t-1}$	0.742*** (3.03)	0.980*** (3.49)	0.148 (0.68)	0.201 (0.82)
Expenditure pc $_{t-1}$	5.925 (1.22)	8.143 (1.17)	-71.689** (-2.43)	-69.839* (-1.97)
Δ GDP pc $_{t-1}$	0.003 (0.13)	0.021 (0.84)	0.015 (0.59)	0.024 (0.80)
Δ Housing Price $_{t-1}$	-0.001 (-0.06)	-0.003 (-0.24)	0.041** (2.35)	0.036* (2.00)
Δ CPI $_{t-1}$	0.034 (0.20)	0.077 (0.43)	0.376 (1.66)	0.439* (1.75)
Δ Unemployment $_{t-1}$	-0.024 (-1.06)	-0.014 (-0.50)	-0.086*** (-3.26)	-0.072** (-2.60)
Δ Population $_{t-1}$	0.363** (2.47)	0.466*** (3.68)	0.140* (1.89)	0.309** (2.43)
Time FE	Y	Y	Y	Y
Province FE	Y	Y	Y	Y
Observations	575	575	575	575
Adjusted R2	0.939	0.965	0.939	0.967

Table A5: The Effect of Lottery Prizes on the Local Economy

This table presents estimates of regressions of several macroeconomic variables between year 0 and 1, 2, and 3, at the province level. Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. All regressions control for the total expenditure in the Christmas Lottery per capita. The analysis sample covers the period 1992-2015 period. All regressions include population weights. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Δ GDP t	t+1	t+2	t+3
Top Prize $_{t-1}$	-0.112 (-1.13)	0.012 (0.13)	0.387* (1.75)	0.045 (0.14)
Expenditure pc $_{t-1}$	3.244** (2.47)	3.100** (2.38)	5.139** (2.25)	7.663** (2.22)
Time FE	Y	Y	Y	Y
Observations	1250	1200	1150	1100
Adjusted R2	0.767	0.769	0.765	0.782

	Δ Unemployment t	t+1	t+2	t+3
Top Prize $_{t-1}$	-0.273 (-0.63)	-0.211 (-1.13)	-0.599 (-1.51)	-0.219 (-0.81)
Expenditure pc $_{t-1}$	0.919 (0.80)	1.057 (0.97)	0.928 (0.43)	-0.594 (-0.18)
Time FE	Y	Y	Y	Y
Observations	1250	1200	1150	1100
Adjusted R2	0.629	0.637	0.780	0.813

	Δ Housing t	t+1	t+2	t+3
Top Prize $_{t-1}$	0.835 (1.02)	-0.456 (-0.32)	-1.568 (-0.93)	-3.668 (-1.45)
Expenditure pc $_{t-1}$	1.543 (0.15)	-0.739 (-0.03)	-3.666 (-0.12)	-12.361 (-0.30)
Time FE	Y	Y	Y	Y
Observations	1250	1200	1150	1100
Adjusted R2	0.685	0.730	0.744	0.755

	Δ CPI t	t+1	t+2	t+3
Top Prize $_{t-1}$	0.053 (1.29)	0.252*** (3.51)	0.332** (2.29)	0.380 (1.45)
Expenditure pc $_{t-1}$	2.451* (1.77)	4.961* (1.78)	7.355* (1.80)	9.920* (1.82)
Time FE	Y	Y	Y	Y
Observations	1250	1200	1150	1100
Adjusted R2	0.941	0.945	0.948	0.946

	Δ Population t	t+1	t+2	t+3
Top Prize $_{t-1}$	0.148 (1.29)	0.398* (1.95)	0.647* (1.96)	0.895** (2.34)
Expenditure pc $_{t-1}$	0.125 (0.03)	-1.343 (-0.17)	-3.012 (-0.25)	-5.354 (-0.32)
Time FE	Y	Y	Y	Y
Observations	1250	1200	1150	1100
Adjusted R2	0.578	0.538	0.494	0.456

Table A6: The Effect of Lottery Prizes on the Local Economy: Openness Ratio

This table presents estimates of regressions of GDP per capita and unemployment rate at the province level. Top Prize is a dummy variable that takes a value of one if a given province has the maximum prizes per capita, and zero otherwise. The group of low openness ratio consists of provinces in the bottom tercile of economic openness as proxied by trade-to-GDP ratio. The group of high openness ratio consists of provinces in the top tercile of economic openness as proxied by trade-to-GDP ratio. All regressions control for the total expenditure in the Christmas Lottery per capita. The analysis sample covers the period 1992-2015 period. All regressions include population weights. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

Δ GDP pc	Low Openness Ratio				High Openness Ratio			
	t	t+1	t+2	t+3	t	t+1	t+2	t+3
Top Prize _t	0.028 (0.45)	0.277 (0.84)	0.610 (1.10)	1.002* (1.87)	-0.281 (-1.66)	0.055 (0.86)	0.105 (0.98)	0.043 (0.24)
Expenditure pc _t	1.369 (1.66)	1.359 (1.58)	2.455 (1.42)	4.822* (1.80)	3.545*** (3.18)	2.286 (1.69)	5.031** (2.27)	6.297** (2.11)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	357	340	323	306	336	320	304	288
Adjusted R2	0.628	0.596	0.711	0.765	0.739	0.767	0.833	0.857

Δ Unemployment	Low Openness Ratio				High Openness Ratio			
	t	t+1	t+2	t+3	t	t+1	t+2	t+3
Top Prize _t	0.991 (0.39)	-2.795* (-1.94)	-3.525** (-2.57)	-2.987 (-1.61)	-0.066 (-0.17)	-0.225 (-0.32)	-0.401 (-0.92)	-0.194 (-0.26)
Expenditure pc _t	-1.656 (-0.34)	-1.899 (-0.59)	-4.364 (-0.45)	-7.033 (-0.65)	-3.173 (-0.97)	-1.587 (-0.48)	-2.292 (-0.45)	-1.262 (-0.16)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	357	340	323	306	336	320	304	288
Adjusted R2	0.596	0.577	0.750	0.790	0.711	0.706	0.837	0.873

Table A7: The Effect of Lottery Prizes on Firm Employment

This table presents the odd ratios of the probability that a newly created firm employees at least 5, 10 and 20 employees in their first year. *Treatment* is a dummy variable that takes a value of one for new firms incorporated in provinces awarded in the previous year with the top prize (treated firms), and zero (control firms) for new firms incorporated in provinces that did not win the lottery prize. We consider both all the firms of our sample, and excluding those in non-tradable and construction sectors. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The analysis sample covers the period 1992-2015 period. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	All Firms			Excl. non-trad- and cons.		
	Employees ≥ 5	Employees ≥ 10	Employees ≥ 20	Employees ≥ 5	Employees ≥ 10	Employees ≥ 20
Treatment	1.115** (2.55)	1.109*** (2.71)	1.164*** (2.78)	1.111** (2.18)	1.087 (1.29)	1.142* (1.91)
Expenditure pc_{t-1}	0.215 (-1.21)	0.158 (-1.09)	0.026 (-0.75)	0.777 (-0.27)	0.152 (-1.17)	0.074 (-0.77)
Δ GDP pc_{t-1}	1.013*** (3.37)	1.020*** (3.58)	1.028** (2.51)	1.008 (1.50)	1.016* (1.91)	1.020 (1.52)
Δ Housing Price $_{t-1}$	1.002 (1.46)	1.001 (0.51)	0.999 (-0.43)	0.999 (-0.66)	0.997 (-1.24)	0.997 (-0.82)
Δ CPI $_{t-1}$	1.019 (0.65)	1.001 (0.03)	0.944 (-0.98)	1.041 (1.14)	1.000 (-0.01)	0.933 (-0.79)
Δ Unemployment $_{t-1}$	0.996 (-1.16)	0.997 (-0.63)	1.004 (0.42)	0.994 (-1.33)	0.988 (-1.44)	1.001 (0.05)
Δ Population $_{t-1}$	0.981** (-2.03)	0.979 (-1.05)	1.016 (0.66)	0.988 (-1.20)	0.984 (-0.85)	0.986 (-0.48)
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Observations	184252	184252	184246	99385	99385	99380
Pseudo R2	0.012	0.016	0.020	0.016	0.018	0.022

Table A8: The Effect of Lottery Prizes on Entrepreneurial Activity: Alternative Explanatory Variables

This table presents estimates of regressions of the self-employees net entry rate of the number of firms between year $t-1$ and t . Prize pc_{t-1} is the amount of lottery prizes per capita in each province (in euros thousands) in year $t-1$; Prize gdp_{t-1} is the amount of lottery prizes per GDP in each province (in %) in year $t-1$; and Awarded Tickets pc_{t-1} is the number of winning tickets (in thousands) per capita in each province in year $t-1$. These three main explanatory variables are standardized with zero mean and standard deviation of 1. All regressions control for the total expenditure in the Christmas Lottery per capita and the growth rate of a set of macroeconomic variables previously defined. The analysis sample covers the period 2005-2015 period. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	(1)	Net Entry Rate (2)	(3)
Prize pc_{t-1}	0.061*** (3.71)		
Prize gdp_{t-1}		0.062*** (3.37)	
Awarded Tickets pc_{t-1}			0.076 (1.65)
Expenditure pc_{t-1}	22.154*** (4.32)	22.103*** (4.31)	20.817*** (4.16)
Δ GDP pc_{t-1}	0.023 (1.25)	0.023 (1.25)	0.024 (1.34)
Δ Housing Price $_{t-1}$	0.020*** (4.72)	0.021*** (4.72)	0.021*** (4.68)
Δ CPI $_{t-1}$	0.302 (1.27)	0.302 (1.27)	0.288 (1.21)
Δ Unemployment $_{t-1}$	-0.073** (-2.46)	-0.073** (-2.46)	-0.070** (-2.42)
Δ Population $_{t-1}$	-0.249*** (-2.78)	-0.249*** (-2.78)	-0.247*** (-2.77)
Time FE	Y	Y	Y
Province FE	Y	Y	Y
Observations	550	550	550
Adjusted R2	0.811	0.811	0.812