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JEL Classification: D14, L26

Keywords: entrepreneurship, firm creation, Aggregate income, Local demand, Financial Development, Self-employment, public policy

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Entrepreneurship and Regional Windfall Gains: Evidence from the Spanish Christmas Lottery*

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November 11, 2019

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The Spanish Christmas Lottery is the largest lottery worldwide. We exploit local windfall gains arising from lottery prizes to estimate the effect of income on entrepreneurship. We find higher firm creation and greater self-employment in winning provinces. Our estimates imply that 46 firms are created for every €1,000 increase in disposable income per capita. The effect occurs in both non-tradable and tradable industries, and is more pronounced in regions with poorer access to finance. Firms created in winning provinces are larger, create more value-added, and are more likely to survive. These results suggest that local income and financial development are important drivers of entrepreneurship.

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1 Introduction

Promotion of entrepreneurship is a prime concern for many governments. Firm creation by entrepreneurs who seek to profit from business opportunities is a fundamental force for economic prosperity and job creation (Ayyagari, Demirguc-Kunt, and Maksimovic (2011), Haltiwanger, Jarmin, and Miranda (2013)). Policies to encourage entrepreneurship include tax breaks for new businesses, reduced red tape to set up new firms, and subsidized lending to start-ups and small businesses. Other policy tools that may promote economic activity by increasing disposable income (e.g., reduced personal income taxes, tax rebates) can also encourage business creation.

While the costs of these policy tools may be well understood, the benefits in terms of increased entrepreneurial activity are not. Do shocks to disposable income spur entrepreneurship? What is the elasticity of firm creation to income? What does this elasticity depend on? Are there spillovers across regions? What are the characteristics of firms that are created as a result of shocks to income? We aim to answer these questions.

Measuring the effect of income on firm creation is difficult because many of the variables that affect income might also influence entrepreneurial activity. We focus on exogenous variation in disposable income across areas arising from prizes paid by the Spanish Christmas Lottery. Several features of the Spanish Christmas lottery make it suitable for this study. First, the lottery prize has an economically significant impact – the "winning" province (the province that receives the maximum prize per capita each year) gets an average income shock equivalent to 3.5% of its gross domestic product (GDP).[1] Second, the lottery does not award one large prize to a few individuals, in which case the distribution of the income shock would be different from that generated by typical policy mechanisms. Rather, the lottery prize is distributed among several thousand people sharing the same ticket number.[2] Third, the lottery is played every year, whatever the economic conditions,

[1] The provinces with the second, and third-highest prizes per capita receive an income shock equivalent to 1% and 0.5% of GDP, respectively. The remaining 47 provinces in Spain typically receive about one-third of the total amount they spent through award of minor prizes, approximately 0.1% of GDP.

[2] According to survey data, 87% of the people participate through a syndicate. They share their ticket price with relatives (64%), friends (33%), or co-workers (28%). Lottery winners also typically share a prize

while policy changes are infrequent and enacted depending on actual or expected economic conditions. Fourth, lottery winners are geographically concentrated. Most prizes are collected in the province where tickets are sold; each euro of lottery prizes implies an increase in province household disposable income of 87 cents during the year when prizes are collected. This concentration generates significant variation in prizes across provinces. Finally, lottery players are likely to be ordinary citizens, because the lottery is a social event – about 75% of the population participates. This mitigates concerns that the effect we measure is driven by the behavior of gamblers, which might differ from that of an average individual.

The key assumption in our empirical strategy is that the winning province is randomly assigned *conditional* on expenditures on lottery tickets by province. It is important to condition on lottery expenditures as, unconditionally, the probability of winning could be correlated with entrepreneurship. This correlation could arise if the conditions that prompt individuals to buy lottery tickets are the same as those that encourage entrepreneurship. In that case, more entrepreneurial provinces would buy more tickets, and thus would be more likely to win. Indeed, we show that the probability of winning is a function of observable variables, such as provincial GDP per capita. After we control for lottery expenditure, however, no macroeconomic variable has any explanatory power to predict the winning province. Thus, the lottery setting seems to allow us to examine truly exogenous variation in regional disposable income after controlling for lottery expenditure.

We find that regional windfall gains due to the lottery have a significant effect on entrepreneurial activity. The number of new businesses increases significantly in winning provinces. The effect is economically sizable; the number of new firms as a fraction of established firms (entry rate) in winning provinces increases by about 0.9 percentage points over non-winning provinces in a given year. Considering that the average entry rate is 9% in our sample, the effect of the income shock represents about 10% of the average. We find no significant effect on the exit rate of businesses. The reason could be that while established

with their relatives.

firms might benefit from an increase in local demand, they might also suffer from an increase in competition from new businesses.

We also analyze how lottery prizes affect the dynamics of firm creation over time. The rate of firm creation is similar in both winning and non-winning provinces in the years before the lottery, mitigating concerns of preexisting differential trends. After the lottery, the rate of firm creation increases significantly more in winning provinces than in non-winning provinces. This differential effect disappears three years after award of the lottery prizes.

To generalize our results beyond the lottery setting, we estimate the effect of disposable income on entrepreneurship. We address the endogeneity of disposable income by instrumenting it using the size of the lottery prize (per capita) in each province. Our first stage confirms that most prizes are collected by households in the province where the tickets are sold. The second-stage regression implies that a €1,000 increase in disposable province income per capita increases the rate of firm creation by 0.3 percentage points. This estimate implies that 46 new firms are created for each €1,000 increase in disposable income per capita, or one new firm for every €22.

Next, we analyze how the effects of the income shock propagate geographically. While the lottery prize provides exogenous variation in disposable income, the treatment effect estimates can be biased if there are spillover effects to nearby (control) provinces. For example, if the lottery encourages entrepreneurship in nearby provinces that are included in our control group, that would weaken our estimates of the treatment effect. We examine this possibility by directly examining the effect of the lottery on provinces closer to and farther from the winning province. We find a significant increase in firm creation in provinces located within 100 kilometers of the winning province, but the effect tends to disappear for greater distances. Indeed, our coefficient on the effect of the lottery on the winning province increases slightly.

We next examine outcomes for firms created following the lottery income shock using firm-level information. We find that firms created as a response to the income shock are, on average, significantly larger (in terms of assets, number of employees, and sales) and create more value-added. We also analyze the survival of firms created due to the lottery income

shock. Firms created in winning provinces survive at a higher rate than firms created in non-winning provinces. We conclude that the marginal firm created following the lottery income shock is of better quality. These results are consistent with Sedláček and Sterk (2017), who find that firm quality and growth are influenced by economic conditions at the time of entry.

The overall impact of shocks to disposable income on entrepreneurship can be explained by at least two non-mutually exclusive channels. First, new businesses might spring up as entrepreneurs take advantage of new investment opportunities resulting from an increase in local demand (demand channel). Second, in the presence of financial frictions, entrepreneurs might not start new businesses for lack of financial resources. The lottery income shock, by relaxing these financial constraints, might lead to more business creation (financial constraints channel). Additional tests allow us to identify the effect of the demand and financial constraints channels on entrepreneurship.

We also compare the response to the income shock across industries. The effect on firm creation is positive and significant for businesses operating in industries that depend heavily on local demand (i.e., non-tradable industries) as well as for firms that do not depend on such local demand (tradable and manufacturing industries). The extent of the effect of the lottery on firm creation is also similar for both groups. As tradable industries do not rely as much on local demand as non-tradable industries, this result supports the hypothesis that the relaxation of financial constraints can drive our effect.

Researchers have long observed that entrepreneurial activity tends to vary systematically across regions (e.g., Carlton (1983)). The heterogeneity of Spanish provinces gives us an ideal laboratory to examine the effect of disposable income on entrepreneurship across different levels of financial development and access to finance. Specifically, we study how access to credit interacts with entrepreneurs' ability to pursue investment opportunities using number of bank loans and number of bank branches by province as measures of local access to credit. We find that the lottery prize has a greater effect on entrepreneurship in provinces with poorer access to credit, particularly for small and new firms. These findings are consistent with the idea that financial constraints impair firm creation.

We also examine the effect of the lottery at the municipality level.[3] When we focus on municipalities, we find a large and significant effect of the lottery on entrepreneurship for firms that depend on local demand (i.e., non-tradable industries). The effect is also large and significant when we exclude firms that depend on local demand and focus on municipalities with large concentration of firms (industrial parks). These findings are consistent with the idea that high entrepreneurial activity may generate human capital externalities and knowledge spillovers, making it easier for potential entrepreneurs to learn how to start a business (Gennaioli, La Porta, Lopez-de Silanes, and Shleifer (2012)). We conclude that the concentration of entrepreneurial activity might impact the firm creation response.

Finally, for an alternative measure of entrepreneurship, we examine the effect of the income shock generated by the lottery on self-employment. We find a positive and significant increase in the growth of self-employed individuals as a response to the income shock. The number of self-employed people in winning provinces increases by about 0.7 percentage points over that in non-winning provinces in a given year. We find that the self-employment response is driven mainly by male and domestic residents.

Our study contributes to three strands of the literature. First, we add to the literature on the link between economic activity and firm creation. Several studies show the role of firm creation in the amplification and propagation of exogenous economic shocks (Bilbiie, Ghironi, and Melitz (2012), Koellinger and Thurik (2012), Clementi and Palazzo (2016), Sedláček and Sterk (2017)). Adelino, Ma, and Robinson (2017) show that new firms are the main driver of job creation following changes in investment opportunities driven by local demand (i.e., non-tradable industries), and Decker, McCollum, and Upton (2017) find that start-ups are responsible for most job creation in response to economic expansions due to shale oil and gas discoveries. Bernstein, Colonnelli, Malacrino, and McQuade (2018) show that firm creation as a response to an increase in local demand is driven mainly by young and skilled individuals. Our paper contributes to this literature by exploiting a random income shock in order to deal

[3]There are more than 8,000 municipalities in Spain and 160 municipalities in the average province.

with the endogeneity of economic conditions. We provide causal evidence that local economic opportunities attributable to an increase in aggregate demand spur entrepreneurial activity.

Second, we contribute to the literature on financial constraints and entrepreneurship. The relation between entrepreneurial wealth and firm creation has received considerable attention in the literature, but the precise economic mechanisms underlying the role of wealth in firm creation are not well understood. There is substantial evidence showing a strong positive correlation between wealth and the propensity to start a business (Evans and Jovanovic (1989), Evans and Leighton (1989), and Holtz-Eakin, Joulfaian, and Rosen (1994)). Yet, Hurst and Lusardi (2004) report that only for individuals at the very top of the wealth distribution is there a positive relation between wealth and business entry. This suggests that differences in wealth may be proxying for differences in ability or preferences, rather than liquidity. More recently, Adelino, Schoar, and Severino (2015) and Schmalz, Sraer, and Thesmar (2017) show that financial constraints restrict firm creation; they use variation in housing prices as shocks to the value of real estate collateral. These authors identify the effect of liquidity by comparing full homeowners with partial homeowners and renters, as only full owners can fund a new venture using their real estate as collateral. These two groups, however, may differ in characteristics such as ability and risk aversion, both important determinants of entrepreneurship. We add to this literature by using windfall gains (i.e., the randomized assignments of monetary prizes provided by a syndicated lottery) as shocks to individual income and liquidity.

Finally, we contribute to a growing literature that uses lottery data as an exogenous (unearned) income shock in order 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)); consumption (Kuhn, Kooreman, Soetevent, and Kapteyn (2011)); stock market participation (Briggs, Cesarini, Lindqvist, and Ostling (2019)); and political election outcomes (Bagues and Esteve-Volart (2016)). One caveat related to the lottery setting is that the results may not represent the typical response to

other forms of unearned income. At the same time, two key aspects of the Spanish Christmas Lottery differentiate it from other lotteries – it is a social event, and it produces an income shock to several thousand households in the same geographic area. Thus, this provides a unique setting to study how economic conditions affect entrepreneurship.

2 Christmas Lottery

The Spanish Christmas Lottery (*Lotería del Gordo*) is a national lottery game that has been held since 1812. Today the lottery takes place every year on December 22. It is the biggest lottery worldwide. Compared with the more than 500 other lotteries held every year in Spain, the Christmas Lottery represents one-fifth of total lottery sales. About 75% of the population participates. 80% of the participants are between 25 and 44 years old and hold a college degree, and around 70% of them play no other lottery. The amount of money spent is similar across individuals; 70% of individuals spend less than €60, and only about 8.5% spend more than €150.

The tickets have five-digit numbers. There were 66,000 numbers played until 2004, 85,000 between 2005 and 2010, and 100,000 since 2011. Each number is typically sold by one lottery outlet, and the numbers allocated to each outlet are randomly assigned. During our sample period, each number is divided on average into 160 series. Each of these series consists of 10 fractions, and each of these fractions can be divided into up to 10 shares. Thus, depending on the number of shares sold, there could be between 1,600 and 16,000 ticket holders for each number. The price of a fraction is €20, so the cost of buying an entire number is €32,000. One ticket usually corresponds to one fraction.

The money allocated for prizes is 70% of the money collected (i.e., €2,320 million). The remaining 30% is distributed as commissions for sales outlets, for internal revenue, and to cover administrative costs. Holders of the first prize get €20,000 per euro played; holders of the second prize get €6,250 per euro and holders of the third prize get €2,500.[4] Thus, a standard

[4]Prizes were €10,000, €4,800, and €2,400 per euro played between 1986 and 2004, and €15,000, €5,000, and €2,500 between 2005 and 2011. All lottery prizes were tax-exempt until 2013, and a 20% tax was

ticket (€20) holder who wins the first prize receives more than ten times the average Spanish household income (€32,000) and more than the average wealth of a household (€257,000).

3 Data

We obtain data on expenditures and monetary prizes of the Christmas Lottery from *Sociedad Estatal Loterias y Apuestas del Estado*. Our sample covers the period from 1992 through 2015. For each province, we observe where tickets awarded with the top three prizes were sold, as well as total number of tickets sold, lottery expenditures, and lottery prizes awarded. The provinces are identified by the location of the outlets that sold the winning tickets.[5] While we have information on the top three prizes, which account for about three-quarters of the total prizes, we cannot observe the other (smaller) prizes. Thus, we consider only the top three lottery prizes in our analysis. One might ask whether players buy tickets other than where they live or exchange tickets with people in their network who live in other provinces. Using National Accounts statistics, though, we show that most prizes are collected in the province where the tickets were sold.

We use firm-level data from the Amadeus and Sabi databases for the 1992-2015 period. Amadeus is a commercial pan-European database provided by Bureau van Dijk. For Spain, Amadeus covers financial information on over 2.5 million public and private companies. The database includes detailed firm-level characteristics and financial data. Amadeus also provides information on year of incorporation, industry (three-digit NACE code—the European standard of industry classification), the zip code of firm location. The other source of information is the Sabi database, an enhanced version of Amadeus for Spain. Sabi is useful because it covers a larger fraction of new and small firms across all industries, and provides information not only on active firms but also on firms that have ceased operation.[6]

imposed for prizes larger than €2,500 since 2013. See Bagues and Esteve-Volart (2016) for more details about Christmas Lottery players' characteristics.

[5]To implement our analysis at the municipality level, we identify the municipalities by the location of the outlets that sold the winning tickets. These come from *Sociedad Estatal Loterias y Apuestas del Estado* for the period 2002-2015 and from library of *El Pais* (the major Spanish newspaper) for the period 1992-2001.

[6]We perform robustness tests using data aggregated at the province level from the Spanish Central

We obtain information on macroeconomic variables at the province level for 1992-2015. The data on disposable income, gross domestic product (GDP), consumer price index (CPI), unemployment, and population are from INE.[7] Data on loans and bank branches are from the Bank of Spain, and data on house prices are from several sources.[8] Data on self-employed individuals and their characteristics come from the Ministry of Labor and Social Security.

3.1 Summary Statistics

Table 1 presents summary statistics for the lottery and macroeconomic variables at the province level. Panel A summarizes the lottery expenditure, number of winning tickets, and lottery prizes (top three) by province. The average yearly expenditure per capita in a province is €57, representing about 0.29% of the provincial GDP. The average lottery prize is €21 per capita or about 0.10% of the provincial GDP. There are on average slightly more than 91 winning tickets in a province, or 0.03 winning tickets per capita.

Panel B of Table 1 reports summary statistics for the province with the maximum prize per capita in each year (winning province). Winning provinces spend €76 per capita on lottery tickets on average, which not surprisingly is above the average of €57 for all provinces. The average lottery prize per capita is €748, which represents almost 3.5% of the provincial GDP per capita. The number of tickets awarded in winning provinces is about 1,500, which represents approximately one for every 700 individuals. Because the €20 tickets tend to be split into smaller shares of €10 and €5, this figure should be considered a lower bound for the number of people receiving lottery prizes.

Panel C reports average macroeconomic characteristics of the provinces. The average province has GDP per capita of about €20,000, a 2.8% inflation rate, a 17% unemployment rate, and 862,000 inhabitants.

Directory of Enterprises (*Directorio Central de Empresas*, DIRCE). The data are compiled by the Spanish National Statistics Office (*Instituto Nacional de Estadistica*, INE) at the province-level, but do not provide firm-level data. DIRCE is the first official database on individual firms for the Spanish economy, which covers the entire population of existing firms. Results are shown in the Internet Appendix.

[7] Data on disposable income are available only for the period 1995-2010.

[8] *ST Sociedad de Tasación* (the largest independent Real Estate Valuation firms in Spain), and *Idealista* and *Fotocasa* (the two largest real estate web portals in Spain).

Figure 1 shows the average lottery expenditure per capita (Panel A) and average prize per capita (Panel B) by province during our sample period. There is a large variation across Spanish provinces both in terms of where the lottery was awarded and how much was the total prize per capita. Our empirical setting exploits this variation.

Table 2 compares averages of the outcome variables across winning and non-winning provinces. Winning provinces are those that receive the maximum prize per capita in any given year. The table reports the total number of firms, the number of new firms, the number of new firms divided by the number of established firms (entry rate), the number of firms liquidated divided by the total number of established firms (exit rate), and the number of self-employed individuals. Overall, there are no significant differences between winning and non-winning provinces.

Table 3 reports summary statistics for the characteristics of new firms at creation such as assets, number of employees, sales, value-added (sales minus outside purchases of materials and services), wages, leverage (as proxied by the debt-to-assets ratio), and probability of default (as proxied by the Z-score).[9] The average new firm has €499 thousand in assets, 7 employees, €232 thousand in sales, €132 thousand in value-added, total wages of €51 thousand, a debt-to-assets ratio of 0.52, and a Z-score of 2.5. Table IA.1 in the Internet Appendix reports summary statistics for self-employed individuals including breakdown by characteristics such as sex, nationality, age, number of employees, and sector.

4 Empirical Strategy

We exploit exogenous variation in disposable income arising from lottery prizes to estimate the effect of disposable income on entrepreneurial activity. Clearly, an ordinary least squares (OLS) regression of disposable income on entrepreneurial activity would deliver biased estimates, as many unobservable variables could drive both. Instead, we estimate reduced-form regressions of entrepreneurial activity on lottery prizes at the province level

[9] We measure the Z-score as 0.717 × Working Capital/Assets + 3.107 × EBIT/Assets + 0.42 × Equity/Assets + 0.998 × Revenues/Assets.

and instrumental variables (IV) models using the lottery prize as an instrument for disposable income later. Here, we discuss the validity of our instrument focusing on the exclusion restriction.

The exclusion restriction for this empirical strategy requires that the lottery prize influence the rate of firm creation only through changes in disposable income. We present evidence suggesting that this is likely to be the case. While the winning number is randomly chosen, the number of tickets bought in each province might not be. Moreover, the decision to buy lottery tickets might be influenced by local economic conditions. This would be a concern if the conditions that lead people to buy lottery tickets are the same as those that encourage entrepreneurship.

Table 4 shows this is a real possibility. We estimate a linear probability regression of the winning province (with a dummy variable that takes a value of one for the province with the maximum lottery prize per capita in each year and zero otherwise) on several macroeconomic variables. Column (1) shows that GDP per capita ($GDP\ pc$) has predictive power when we do not include the lottery expenditure in the regression. This is because in richer provinces residents buy more lottery tickets. While we can control for $GDP\ pc$, the concern is that other variables could also be correlated with the probability of winning through the number of tickets bought. For example, provinces with less risk-averse populations might both buy more lottery tickets and be more entrepreneurial.

Yet, because every ticket has the same probability of winning, when we condition on the lottery expenditure in a province, the winning province should be as good as randomly assigned. Indeed, column (2) shows that $GDP\ pc$ is no longer significant when we control for lottery expenditure per capita ($Lottery\ Expenditure\ pc$). Columns (3) and (4) show that no other macroeconomic variable has any power predicting the winning province when we control for lottery expenditure at the province level. We conclude that the lottery prize seems to provide truly exogenous variation in disposable income after controlling for lottery expenditure.[10]

[10]This idea is also supported by the fact that the Spanish Christmas Lottery is more of a social event than a gamblers' lottery.

5 Entrepreneurial Activity and the Christmas Lottery

This section presents the main results. We first present the estimates of reduced-form regressions. We then present the estimates of instrumental variables regressions of the effect of disposable income on entrepreneurship. Finally, we investigate whether there are spillover effects of the lottery prize to provinces other than the winning province.

5.1 Firm Entry and Exit

We examine the effect on entrepreneurship of the random income shock generated by the lottery. Our baseline specification employs a difference-in-differences estimator that compares firm creation in provinces that receive the maximum lottery prize per capita (winning provinces, treatment group) relative to other provinces (non-winning provinces, control group) in each year.

The province-level (reduced-form) regression we use is as follows:

$$\begin{aligned} Y_{j,t} = {} & \beta \textit{Lottery Prize Dummy}_{j,t-1} + \theta \textit{Lottery Expenditure pc}_{j,t-1} \\ & + \gamma Z_{j,t-1} + \delta_j + \delta_t + \varepsilon_{j,t} \end{aligned} \tag{1}$$

where $Y_{j,t}$ is the entry rate (number of new firms in year t divided by number of established firms in year $t-1$) in province j or the exit rate (number of firms liquidated in year t divided by number of established firms in year $t-1$); $\textit{Lottery Prize Dummy}_{j,t-1}$ is a dummy variable that takes a value of one if province j receives the maximum prize per capita in year $t-1$, and zero otherwise; and $\textit{Lottery Expenditure pc}_{j,t-1}$ is the lottery expenditure per capita (in thousands of euros) in province j in year $t-1$.[11] $Z_{j,t-1}$ includes the logarithm of GDP per capita ($GDP\ pc$), the logarithm of housing prices ($Housing\ Price$), the logarithm of the population ($Population$), the inflation rate ($Inflation\ Rate$), and the unemployment rate ($Unemployment\ Rate$) in province j. The coefficient of interest β measures the average

[11] The lottery prize is awarded on December 22 of year $t-1$, but disbursed a few days later in January of year t.

difference in the entry rate or exit rate between winning and non-winning provinces.[12] δ_j is a province fixed effect, and δ_t is a time fixed effect.

Table 5 shows the results for the entry rate. We find a positive and significant effect of the lottery prize on the entry rate in winning provinces compared to non-winning provinces. The regression in column (1) controls for lottery expenditure and time fixed effects. The coefficient of interest β is 0.65, which indicates that the entry rate in winning provinces is 0.65 percentage points higher than the rate in non-winning provinces.

Results are robust to the inclusion of additional control variables in column (2) and province fixed effects in columns (3) and (4). The province fixed effects in column (3) control for unobserved time-invariant province heterogeneity, so the estimator is driven solely by within-province variation. The estimate in column (3) indicates that the entry rate increases by about 0.86 percentage points more for winning provinces than non-winning provinces. Given that the average entry rate is about 9% over the sample period, the effect of the lottery prize represents about 10% of the average. Column (4) shows that the results are robust when we include both controls and province fixed effects. In column (5), results are also robust when we drop from the sample Madrid and Lleida, which are provinces with special characteristics.[13]

Table 6 shows the results for the exit rate. While the coefficient on the effect of the lottery prize on the exit rate is consistently negative, it is significant only in column (5) when the sample excludes Madrid and Lleida. The largely insignificant effect may be explained by the operation of two opposing forces. On the one hand, the income shock increases firm creation and increases competition, which increases the exit rate. On the other hand, the lottery has a positive effect on local demand, which reduces the exit rate.

Figure 2 shows the effect of the lottery prize on firm creation in winning provinces (treatment group) versus non-winning provinces (control group). We use the specification in

[12] All values are measured as of December, and growth is measured as the change between year $t-1$ and year $t-2$.

[13] Madrid is the capital and largest city in Spain, and exhibits unique features such as high lottery expenditure and economic activity. The province of Lleida includes the city of Sort, which has a strong Christmas Lottery tradition and spends large amounts on it (around 3% of total sales).

equation (1) with four lags and four leads of the *Lottery Prize Dummy* variable. The dependent variable is the logarithm of the number of new firms in province j in year t. The figure presents the estimated β coefficients and corresponding 95% confidence intervals. One can see a significant increase in the number of new firms created in the two years after lottery awards in winning provinces relative to non-winning provinces. Moreover, we find that treatment and control groups follow parallel trends before lottery prize awards (the treatment), mitigating concerns about preexisting differential trends.

Results of several robustness checks of our primary findings are reported in the Internet Appendix. Table IA.2 shows that the net entry rate results (i.e., growth rate of number of firms) using the full population of firms (at the province level) provided by the Spanish National Statistics Office are similar to the entry rate results in Table 5. Table IA.3 reports estimates consistent with those in Tables 5 and 6 when we use the logarithm of the number of new firms (*Entry*) and the logarithm of the number of firms liquidated (*Exit*) as dependent variables, respectively. Table IA.4 shows that the entry rate results are robust when we scale number of new firms by population, rather than by number of firms.

We also consider continuous explanatory variables to measure the effect of the lottery on firm creation. We use the lottery prize (in thousands of euros) per capita (*Lottery Prize pc*), the lottery prize divided by GDP (*Lottery Prize/GDP*), and the number of winning tickets per capita (*Winning Tickets pc*). Table IA.5 shows a positive and significant effect on the entry rate for all three variables. Note, in particularly that, column (1) indicates that when a province is awarded €1,000 in lottery prize per capita, the entry rate increases by 0.28 percentage points. Because there are an average of 16,000 firms in a province, this estimate implies that 45 new firms are created for every €1,000 of prize per capita (or one new firm for every €22 of prize per capita).

5.2 Instrumental Variables Estimates

The reduced-form estimates so far show that lottery prizes have a positive and significant effect on entrepreneurial activity. While the results are interesting in their own right, they

cannot be generalized beyond the lottery setup. To provide a more general parameter, we use lottery prizes as an instrument to estimate the effect of disposable income on firm creation.

Table 7 shows our results. In the first-stage regression, we predict disposable income per capita (in thousands of euros) in each province using the lottery prize per capita (*Lottery Prize pc*). Importantly, the first-stage regression includes the total expenditure on lottery tickets at the province level, as the underlying assumption of our empirical strategy is that prizes are as good as randomly assigned conditional on lottery expenditure. Column (1) indicates that disposable income per capita increases by 87 cents for every euro of lottery prize. The F-statistic of this first-stage regression is 399.2, well above the conventional threshold for weak instruments (Stock and Yogo (2005)).

Next, we turn to the effect of disposable income on entrepreneurial activity. In the second-stage regression, the dependent variable is the entry rate. For purposes of comparison, column (2) presents an OLS regression of the entry rate on disposable income per capita (without instrumenting disposable income with the lottery prize). We find that the *Disposable Income pc* coefficient is positive and significant. This estimate indicates that a €1,000 increase in disposable income per capita increases the entry rate by 0.46 percentage points. Note that the OLS estimate may be biased because of the endogeneity of disposable income.

Column (3) shows the second-stage results when disposable income per capita is instrumented with the lottery prize per capita. We find that a €1,000 increase in disposable income per capita increases the entry rate by 0.29 percentage points. The estimate in column (3) is lower than the OLS estimate in column (2). This estimate implies that 46 new firms are created for every €1,000 of prize per capita, or one new firm for every €22 of prize per capita.

Table IA.6 of the Internet Appendix uses alternative dependent variables that aggregate outcome variables of new firms in their first year at the province level. For example, for every year and province, we sum all the assets of new firms created in that year, divided by total population. We use the aggregate outcome as the dependent variable and the instrumental

variables specification in Table 7. A €1,000 increase in disposable income per capita translates into an aggregate increase of €45 in firm assets, €13 in firm sales, and €27 in firm equity, per capita.

5.3 Spillover Effects

We have shown that the lottery prize provides plausible exogenous variation in disposable income after controlling for lottery expenditure. Even with random assignment, however, identification of treatment effects can be biased if there are spillover effects. For example, if the lottery encourages entrepreneurship in nearby provinces that are included in our control group, that would weaken our estimates of the treatment effect. Thus, we examine whether there are spillover effects of the lottery income shock to provinces other than the winning province. That is, we estimate the regression in equation (1), but allow for spillover effects across provinces.

We identify the center of a province by calculating the average coordinates of all municipalities in each province. We use the geographic location of each municipality, represented as the two-dimensional coordinates (X,Y) on a map in geospatial vector data format. To set the spillover area, we include provinces whose center is within a distance of 100, 150, or 200 kilometers from the center of a winning province.[14] For each province, we construct *Spillover 100km*, *Spillover 150km*, and *Spillover 200km* dummy variables that take a value of one if the center of the province is within 100, 150, or 200 kilometers of the center of the winning province, and zero otherwise. We also construct *Spillover 101-150km* and *Spillover 151-200km* dummy variables that take a value of one for the particular ranges of the center of a given winning province, and zero otherwise. These variables measure the spillover effects of the lottery prize on firm creation in nearby provinces.

Table 8 shows the results. Column (1) shows that the *Lottery Prize Dummy* coefficient is

[14] On average, there are 2.5 provinces that are 100 kilometers from the center of a winning province, 3.1 provinces within between 101 kilometers and 150 kilometers, and 4.4 provinces within between 151 kilometers and 200 kilometers.

positive and significant at 0.85 when we exclude the Spanish islands from the sample.[15] This estimate is similar to that in column (2) of Table 5 when we include all provinces in the sample. Columns (2)-(5) show the estimates when we include both the spillover effects variables and the effect of the lottery prize on the winning provinces. The estimated coefficient in column (2) is 0.44 for the spillover effect within 100 kilometers (*Spillover 100km*). This indicates that the entry rate increases by 0.44 percentage points in the spillover region compared to non-winning provinces. The *Lottery Prize Dummy* coefficient remains positive and significant.

The spillover effect declines when we increase the distance of the spillover region to include provinces that are farther away. Column (3) shows that the spillover effect within 150 kilometers (*Spillover 150km*) remains positive at 0.41 and statistically significant. Column (4) shows that the spillover effect to all provinces within 200 kilometers (*Spillover 200km*) of the winning province is smaller but still statistically significant (at the 10% level). In column (5), we estimate the spillover effects of the lottery prize in different provinces according to their distance from the winning province. The spillover effect is positive and significant for provinces within 100 kilometers of the winning province, but it becomes statistically insignificant for provinces that are more than 100 kilometers away.

The presence of a positive spillover effect will tend to bias the *Lottery Prize Dummy* coefficient downward because nearby provinces are affected by the income shock but are included in the control group in our main regression. Indeed, as one can see in Table 8, the lottery prize has an increased effect on the winning province when we control separately for nearby provinces.

Our results suggest that in a very interconnected economy, where many of the goods and services consumed in a local region can be imported from or exported to other provinces, a thorough understating of geographic spillovers is key to the design of policies for the promotion of entrepreneurship and "place-based" policies focused on local agglomeration effects.

[15] We exclude the Spanish islands from the sample to more accurately estimate the spillover effects. The results are similar when we include the islands in the sample.

6 New Firm Outcomes and Survival

Next we study the effect of the lottery income shock on the outcomes of newly created firms, conditional on entry.

We estimate the regression of outcomes of new firms in year t:

$$Y_{i,j,t+n} = \beta_n Lottery\ Prize\ Dummy_{j,t-1} + \theta_n Lottery\ Expenditure\ pc_{j,t-1} + \gamma_n Z_{j,t-1} + \delta_j + \delta_t + \varepsilon_{i,j,t+n} \quad (2)$$

where $Y_{i,j,t+n}$ is the logarithm of assets, the logarithm of number of employees, the logarithm of sales, the logarithm of value-added, the logarithm of wages, leverage (as measured by the debt-to-assets ratio), or the probability of default (as proxied by the Z-score) of firm i in province j in year $t+n$. $Lottery\ Prize\ Dummy_{j,t-1}$ is a dummy variable that takes a value of one for new firms incorporated in provinces that saw the maximum prize per capita awards in year $t-1$. Other variables in equation (2) are defined as in equation (1). By including province fixed effects δ_i, we control for unobserved province-level heterogeneity. Thus, we compare the characteristics of new firms created in the same province.[16]

Table 9 presents estimates at firm creation (year t), and one (year $t+1$), two ($t+2$), and four ($t+4$) years after firm creation. We find positive and significant effects of lottery prizes on the size of new firms as proxied by assets, number of employees, and sales. We also find that lottery awards have a positive and significant effect on the value-added created by new firms in winning provinces. The effects on firm size and value-added can be observed at creation and for up to four years after creation. We conclude that new firms created as a response to lottery prizes are larger and more productive at time of creation, and remain larger and more productive in the long run. In terms of capital structure as proxied by leverage, we do not find a clear pattern between an average new firm and those created in winning provinces. New firms also seem to be less risky at creation as proxied by the Z-score, but differences are

[16] Alternatively, we exclude from our control group, firms created within the next two and three years after lottery awards, and our main results remain unchanged.

statistically insignificant in the post-entry period.

We next examine the effect of lottery prizes on the probability that a newly created firm survives for at least a given number of years. We estimate the regression in equation (2) where the dependent variable is a dummy variable that takes a value of one if the firm survives at least one $(t+1)$, two $(t+2)$, three $(t+3)$, or five years $(t+5)$ after firm creation (t), and zero otherwise. We estimate a linear probability model at the firm level.

Table 10 presents the estimates. We find that firms created in winning provinces versus non-winning provinces are significantly more likely to survive for at least three or five years. The estimates show that a firm created in a winning province has a probability of surviving for at least three years that is 0.5 percentage points higher than in a non-winning province. This effect is higher at 1 percentage point for the probability of surviving at least five years. Our findings suggest that firms created upon a lottery income shock are more likely to survive longer.

Overall, our results indicate that the marginal firm created following the lottery income shock is of better quality. These results are consistent with Sedláček and Sterk (2017), who find that firm quality and growth are influenced by economic conditions at the time of entry. The results are also consistent with the hypothesis that financial constraints hamper growth-oriented entrepreneurship.

7 Demand and Financial Constraints Channels

We implement several tests to identify the role of the local demand and financial constraints channels in explaining the effect of the lottery prize on entrepreneurship. Specifically, we investigate whether the effect of the lottery prize on entrepreneurship is heterogeneous across industries, across provinces with different levels of financial development, and across different types of firms. We also present estimates at the municipality level, to look at smaller units than provinces.

7.1 Industry-Level Analysis

To study whether the effect of the lottery prize on firm entry is heterogeneous across sectors, we analyze industries that depend more on local demand (i.e., non-tradable industries) and industries that depend less on local demand (i.e., tradable industries) following Mian and Sufi (2014). If the effect of lottery awards on firm creation is solely a consequence of an increase in local demand (and not the effect of financial constraints), there should be less of an effect in tradable industries. If financial constraints impair firm creation, however, we should find a significant effect in tradable industries. To analyze this hypothesis, we estimate the relation between lottery awards and firm creation across different industries.

Table 11 shows that our estimates for the *Lottery Prize Dummy* coefficient for tradable industries are of similar size as those 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 0.86 percentage points when we exclude non-tradable industries from our sample. We exclude the construction and non-tradable industries in column (2) and add to that exclusion of the financial sector in column (3). The effect of the lottery on the entry rate is slightly reduced to 0.70 and 0.66, but it remains positive and significant. Column (4) shows that the effect is positive and significant at 0.69 in non-tradable industries. Columns (5) and (6) focus on tradable and manufacturing industries, respectively. We find the impact of the lottery on firm creation remains positive and significant in tradable and manufacturing industries at 0.65 to 0.68. Moreover, the degree of the effect is similar in non-tradable and tradable industries.

We conclude that our results are not driven solely by firms in the non-tradable sector or in the construction sector. These findings are consistent with the hypothesis that financial constraints might hamper entrepreneurship.

Table IA.7 of the Internet Appendix shows the estimates of the new firm outcomes analysis in Table 9 when we exclude non-tradable and construction sectors from the sample. The estimates are similar to those in the full sample with the exception of capital structure. In other words, firms created after the lottery awards rely more on equity capital as a financing source (in both the short and long term). This is consistent with our conjecture

that individuals aiming to start up businesses that do not depend on local economic conditions may face financial constraints that are mitigated by the regional income shock. These results suggest that the lottery prizes help to alleviate financial constraints and provide equity to start a business.

7.2 Financial Development

Financial development may play a role in the effect of the lottery prize on entrepreneurship. It could be that financial constraints create economically meaningful barriers that prevent entrepreneurs from taking advantage of investment opportunities. We use number of bank loans per capita, average amount of debt held by small and young firms (i.e., firms in the lowest quartile of assets during their first year of life in each province), and number of bank branches by province as a measure of local access to credit. We divide the sample into provinces with low and high access to credit according to the median of each of the three variables.

Table 12 shows significantly higher estimates of the *Lottery Prize Dummy* coefficient in the sample with below-median values for all three variables. These results indicate that the lottery prize exerts a greater impact on entrepreneurship in provinces with poorer access to credit. In other words, financial constraints likely play an important role in shaping the effect of the lottery prize on entrepreneurship.

We also analyze whether the impact of the income shock on entrepreneurship is heterogeneous across provinces with different levels of economic development. We divide the provinces by the median value of GDP per capita, labor force participation, housing prices, and vehicle sales per capita. Table IA.8 of the Internet Appendix shows that the effect of the lottery prize on entrepreneurship is more pronounced in provinces with lower economic development.

7.3 Start-Up Capital

Are there differences in the type of firms created after the lottery awards in terms of legal status and capital requirements? To answer this question we estimate equation (1) separately

for different types of firms. We first study the importance of financial constraints in firm creation by exploiting variation in the amount of start-up capital needed to create a new firm (Hurst and Lusardi (2004), Adelino, Schoar, and Severino (2015)). The minimal feasible scale of businesses differs across firm types. Limited liability companies require little start-up capital, while a public limited company requires more start-up capital, probably too much to think it can be financed with lottery prizes.[17]

Table IA.9 in the Internet Appendix shows estimates by the type of firms created after the lottery prize is awarded. We find that the lottery prize has a positive and significant effect on the entry rate for limited liability companies, for which start-up capital is lower. The effect on the entry rate of public limited companies is insignificant and much smaller, as the lottery prize is not enough to meet the capital requirements for public limited companies. This finding is inconsistent with results just be driven by an increase in local demand, because only firms that require low levels of capital to start seem to respond to the lottery prize.

Table IA.10 of the Internet Appendix further displays the effect of the lottery awards on firm creation by dividing the sample according to initial capital requirements. The initial capital requirements are proxied by the average initial capital of new firms in each two-digit industry code. The lottery prize has a stronger effect on firm entry in the sample of industries with lower initial capital requirements. Firms with lower initial capital requirements, those that are more likely to be financially constrained, are those that benefit the most from the income shock.

7.4 Municipality-Level Analysis

To further explore the local demand channel and financial constraints channel with regard to effect on entrepreneurship, we estimate our baseline regression at the municipality level. There are more than 8,000 municipalities in Spain.[18] The municipality-level (reduced-form)

[17] In Spain, the minimum capital required to start a limited liability company is €3,000, while it is €60,000 to start a public limited company.

[18] The data available at the municipality level are limited; the only available macroeconomic variable is population. While we can show that prizes are collected in the province where tickets are sold, we cannot perform this analysis at the municipality level.

regression we use is similar to equation (1):

$$Y_{m,t} = \beta Lottery\ Prize\ pc_{m,t-1} + \theta Lottery\ Expenditure\ pc_{m,t-1} + \gamma Z_{m,t-1} + \delta_m + \delta_t + \varepsilon_{m,t} \quad (3)$$

where $Y_{m,t}$ is the entry rate (number of new firms in year t divided by the number of established firms in year $t-1$) in municipality m; *Lottery Prize* $pc_{m,t-1}$ is the lottery prize per capita (in thousand euros) in municipality m in year $t-1$; and *Lottery Expenditure* $pc_{m,t-1}$ is the lottery expenditure per capita in municipality m in year $t-1$. $Z_{j,t-1}$ includes the same macroeconomic variables as in equation (1) at the province level with the exception of population that is measured at the municipality level. δ_m is a municipality fixed effect and δ_t is a time fixed effect.

Table 13 shows the results. In column (1), the *Lottery Prize pc* coefficient is positive and significant. The coefficient is even larger in column (2) when we add control variables. We conclude that the lottery income shock increases the firm entry rate at the municipality level. The effect is also economically sizable. The estimate in column (2) indicates that if a municipality is awarded €4,000 per capita in lottery prizes, the entry rate increases by 0.15 ($= 0.038 \times 4$) percentage points.[19] This produces less of an effect than at the province level because municipalities are quite small (the median size is 3,000 inhabitants), and spillovers to other municipalities are more likely than are spillovers to larger regions such as provinces.

We also test how the lottery income shock to a municipality affects entrepreneurial activity across sectors. In column (3) we find a significantly reduced effect of the lottery awards when we exclude non-tradable firms. The typical municipality has little industrial activity, so there is less of an effect when we focus on tradable industries. Agglomeration economies or clusters of businesses (e.g., Glaeser, Kerr, and Ponzetto (2010)) might influence the effect of lottery prizes on the rate of firm creation in tradable industries, so, we examine the role of industrial parks on the lottery prize effect at the municipality level. *Industrial Park Dummy* is a

[19] We consider a shock of €4,000 per capita at the municipality level, instead of €1,000, because the standard deviation of the lottery prize is four times higher at the municipality level than at the province level.

dummy variable that takes a value of one in municipalities that are among the top decile of the number of tradable firms and zero otherwise.[20]

Column (4) of Table 13 shows the estimate of a regression that includes the interaction *Lottery Prize pc*$\times$*Industrial Park Dummy*. The interaction term coefficient is positive and significant at the 1% level, and the *Lottery Prize pc* coefficient is positive and significant at the 10% level. The effect of the lottery prize is sizable in tradable industries in municipalities with industrial parks. These findings are consistent with the idea that high entrepreneurial activity may generate human capital externalities and knowledge spillovers, making it easier for potential entrepreneurs to learn how to start a business.

Columns (5) and (6) focus on the entry rate of non-tradable firms, which rely more for success on local demand. In this case, the *Lottery Prize pc* coefficient is positive and significant, and the effect is much stronger. This result indicates that individuals taking advantage of an increase in demand tend to create businesses within the winning municipality. We conclude that both the local demand channel and the concentration of entrepreneurial activity play an important role in explaining our findings.

8 Self-Employment

People might start businesses after the lottery prize is awarded either because they receive an income shock themselves (or someone in their family does) or because the income shock generates new investment opportunities. We repeat the regression in equation (1) using as the dependent variable the growth rate of the number of self-employed individuals between year t and year $t-1$.

Table 14 presents the results. The income shock has a positive and significant effect on self-employment in winning provinces compared to non-winning provinces. Results are

[20] We also require municipalities to be among the top tercile of the number of tradable firms per capita to be included in the group of municipalities with industrial parks. In this way we avoid just capturing the size of the municipalities and we are able to truly identify municipalities with many tradable firms per capita. Using only the number of tradable firms per capita would be a biased measure as that would include many small municipalities.

robust across different specifications. Note in particular the coefficient of interest in column (3), which indicates that the growth rate of self-employed individuals in winning provinces is 0.87 percentage points higher than in non-winning provinces. Given an average number of 41,075 self-employed individuals by province, this corresponds to an increase of about 357 self-employed people.

We also analyze the effect of the lottery prize according to the characteristics of self-employed individuals. These results suggest which individuals are more likely to react to an aggregate income shock by creating a new business. The dependent variable is the growth rate of the number of self-employed individuals by sex, nationality, age, number of employees hired, activity, and sector. Table IA.11 in the Internet Appendix shows that the effect of the lottery prize is stronger for self-employed workers who are male and Spanish nationals. There are no significant differences in terms of age. In addition, we find that the effect is more pronounced for individuals who hire other employees and operate in the manufacturing sector.

9 Conclusion

Entrepreneurship is a key driver of economic growth and job creation. We take advantage of a randomized (unearned) income shock – the Spanish Christmas Lottery – to identify the causal effect of disposable income on entrepreneurship. We show that winning provinces experience a positive differential effect on firm creation compared to non-winning provinces. We find that firm creation is driven by firm entry, rather than a reduction in firm exit. Firms created following the lottery income shock are of better quality. Conditional on entry, firms created in winning provinces are larger; they generate more value-added, and they are more likely to survive longer.

The driver of firm creation due to the lottery income shock is more than investment opportunities and aggregate demand. The income shock has a positive effect on firm creation in the tradable sector, which is less dependent on local demand. The lottery prize effect is

also stronger in provinces with weaker financial development and poorer access to credit. Our results suggest that the increase in entrepreneurial activity in response to income shocks is driven by both an increase in general investment opportunities and a reduction in individual financial constraints.

These results help us understand how public policy can impact entrepreneurship. We know that public policies such as tax rebates or reductions in personal income taxes can have an important role in promoting business. We estimate the elasticity of firm creation to these policies that increase disposable income using the Spanish Christmas Lottery setting. As we analyze how the impact of the lottery income shock on entrepreneurship differs across provinces with different levels of financial development, we can better see the heterogeneous effects of public policies across different regions. Our findings suggest that less financially developed areas benefit the most from public policies intended to promote entrepreneurship.

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Table 1: Summary Statistics for Lottery Variables

This table reports mean, standard deviation, 25th-percentile, median, 75th-percentile and number of observations for each variable by province. Panel A shows the lottery variables. Panel B shows the lottery variables for the province with the maximum prize per capita in each year. Panel C shows the macroeconomic variables. All monetary variables are in constant 2010 euros. The sample covers the period 1992-2015.

	Mean	Standard Deviation	25th Percentile	Median	75th Percentile	Observations
Panel A: Lottery Variables in All Provinces						
Lottery Expenditure pc (€)	56.82	27.92	40.01	52.65	67.74	1,200
Lottery Expenditure/GDP (%)	0.29	0.11	0.22	0.28	0.35	1,200
Lottery Prize pc (€)	21.28	186.33	0.00	0.00	0.68	1,200
Lottery Prize/GDP (%)	0.10	0.83	0.00	0.00	0.00	1,200
Winning Tickets	91.30	346.89	0.00	0.00	10.00	1,200
Winning Tickets pc	0.03	0.19	0.00	0.00	0.00	1,200
Panel B: Lottery Variables in Province with Maximum Prize per capita						
Lottery Expenditure pc (€)	76.49	41.39	46.72	63.17	94.58	24
Lottery Expenditure/GDP (%)	0.34	0.15	0.23	0.32	0.40	24
Lottery Prize pc (€)	748	1,094	184	362	645	24
Lottery Prize/GDP (%)	3.43	4.79	0.88	1.52	3.60	24
Winning Tickets	1,490	835	1,060	1,375	1,831	24
Winning Tickets pc	0.70	0.87	0.16	0.24	0.88	24
Panel C: Macroeconomic Variables						
GDP pc (€ thousand)	19.58	4.86	15.99	18.85	22.68	1,200
Disposable Income pc (€ thousand)	13.46	2.68	11.55	12.98	15.31	850
Housing Price (€ per square meter)	1,205	580	752	1,095	1,528	1,200
Inflation Rate (%)	2.80	1.69	1.89	3.00	3.82	1,200
Unemployment Rate (%)	16.90	8.12	10.35	15.77	21.97	1,200
Population (thousand)	862	1,046	350	564	973	1,200
Loans pc (€ thousand)	18.32	9.98	10.04	16.23	24.93	1,176
Loans per Branch (€ thousand)	19.98	12.72	9.81	16.99	28.09	1,200

Table 2: Summary Statistics for Entrepreneurship Variables

This table reports mean and standard deviation for entrepreneurship variables for winning provinces (24 observations) and non-winning provinces (1,176 observations). Winning provinces are those awarded the maximum prize per capita in each year. The last column shows the t-statistic for the difference in mean between the winning provinces group and the non-winning provinces group. The sample covers the period 1992-2015.

	Non-Winning Provinces	Winning Provinces	t-statistic Difference
Total Firms	15,908	30,486	1.23
	(26,021)	(54,444)	
New Firms	1,044	1,741	1.52
	(1,682)	(2,592)	
Net Entry Rate (%)	5.89	6.47	-0.32
	(8.44)	(8.87)	
Entry Rate (%)	8.58	9.00	-0.35
	(5.11)	(5.64)	
Exit Rate (%)	2.69	2.53	0.19
	(4.49)	(4.53)	
Total Self-Employed	40,351	76,549	-1.20
	(41,494)	(96,051)	

Table 3: Summary Statistics for New Firm Outcomes

This table reports the mean, standard deviation, 25th-percentile, median and 75th-percentile of new firm outcomes. Firm outcomes are total assets, number of employees, sales, value-added (total sales minus outside purchases of materials and services), wages (total amount paid to employees), leverage (debt-to-assets ratio), and probability of default (Z-score) at firm creation. The sample includes new firms created during the period 1992-2015.

	Mean	Standard Deviation	25th Percentile	Median	75th Percentile	Observations
Assets (€ thousand)	499	2,174	19	648	205	392,682
Employees	7.12	215.70	2.00	3.00	5.00	184,252
Sales (€ thousand)	230	704	25	70	185	168,478
Value-Added (€ thousand)	132	400	12	35	100	237,234
Wages (€ thousand)	51	126	7	19	47	249,284
Leverage	0.52	0.68	0.00	0.48	0.75	71,062
Z-score	2.54	9.47	1.00	1.55	3.05	173,824

Table 4: Effect of Macroeconomic Variables on Lottery Prizes

This table presents estimates of the linear probability model of the winning province. The dependent variable is the *Lottery Prize Dummy*, which is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Lottery Expenditure pc_{t-1}		0.537***		0.625***
		(3.66)		(3.53)
GDP pc_{t-1}	0.061**	0.037	0.085*	0.058
	(2.59)	(1.65)	(1.85)	(1.67)
Housing Price_{t-1}			-0.028	-0.016
			(-1.14)	(-0.73)
Population_{t-1}			0.006	0.009*
			(0.86)	(1.69)
Inflation Rate_{t-1}			0.003	0.000
			(0.31)	(0.06)
Unemployment Rate_{t-1}			-0.000	0.001
			(-0.10)	(0.56)
Time Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,150	1,150	1,150	1,150
Adjusted R^2	0.008	0.017	0.010	0.019

Table 5: Effect of Lottery Prizes on Firm Entry

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Lottery Prize Dummy$_{t-1}$	0.647**	0.779***	0.862***	0.837***	0.843***
	(2.25)	(3.17)	(3.59)	(3.23)	(2.71)
Lottery Expenditure pc$_{t-1}$	-10.673***	-4.351	-1.163	0.354	-3.883
	(-2.78)	(-1.15)	(-0.20)	(0.06)	(-0.33)
GDP pc$_{t-1}$		-1.972**		0.822	-0.575
		(-2.20)		(0.31)	(-0.24)
Housing Price$_{t-1}$		-0.605		-1.048*	-0.740
		(-1.32)		(-1.69)	(-1.26)
Population$_{t-1}$		0.207*		0.228	-1.017
		(1.70)		(0.08)	(-0.39)
Inflation Rate$_{t-1}$		0.026		0.064	0.047
		(0.15)		(0.38)	(0.27)
Unemployment Rate$_{t-1}$		-0.011		-0.078***	-0.082***
		(-0.60)		(-2.96)	(-3.06)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	Yes	Yes	Yes
Sample	All	All	All	All	Excl. Madrid & Lleida
Observations	1,150	1,150	1,150	1,150	1,104
Adjusted R^2	0.894	0.903	0.918	0.920	0.922

Table 6: Effect of Lottery Prizes on Firm Exit

This table presents estimates of regressions of the exit rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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.

	(1)	(2)	(3)	(4)	(5)
Lottery Prize Dummy$_{t-1}$	-0.040	-0.112	-0.113	-0.129	-0.246**
	(-0.26)	(-0.84)	(-0.85)	(-1.10)	(-2.33)
Lottery Expenditure pc$_{t-1}$	-5.554***	-1.106	-7.002	-3.009	-6.555
	(-3.21)	(-0.55)	(-1.52)	(-1.21)	(-1.34)
GDP pc$_{t-1}$		0.424		-0.255	-0.179
		(1.33)		(-0.19)	(-0.13)
Housing Price$_{t-1}$		-0.143		-1.069**	-1.215**
		(-0.80)		(-2.16)	(-2.30)
Population$_{t-1}$		0.225***		2.317**	2.436**
		(3.46)		(2.57)	(2.45)
Inflation Rate$_{t-1}$		-0.065		-0.006	-0.020
		(-1.39)		(-0.12)	(-0.40)
Unemployment Rate$_{t-1}$		0.029***		0.016	0.013
		(3.06)		(1.22)	(0.95)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	Yes	Yes	Yes
Sample	All	All	All	All	Excl. Madrid & Lleida
Observations	1,150	1,150	1,150	1,150	1,104
Adjusted R^2	0.956	0.959	0.962	0.963	0.965

Table 7: Effect of Lottery Prizes on Firm Creation: Instrumental Variables

This table presents estimates of the effect of disposable income on firm entry using instrumental variables (IV) methods. *Lottery Prize pc* is the lottery prize (in thousands of euros) per capita. *Disposable Income pc* is the disposable income (in thousands of euros) per capita. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. Column (1) shows the first-stage results of the regression of *Disposable Income pc* on *Lottery Prize pc* at the province level. Column (2) shows the results of an OLS regression of the entry rate between year $t-1$ and year t on *Disposable Income pc* at the province level. Column (3) shows the second-stage results of the regression of the entry rate between year $t-1$ and year t on *Disposable Income pc* instrumented with *Lottery Prize pc* at the province level. The sample covers the period 1995-2010. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	First Stage (1)	OLS (2)	IV (3)
Lottery Prize pc_{t-1}	0.866***		
	(23.78)		
Disposable Income pc_{t-1}		0.462***	0.287**
		(3.47)	(2.16)
Lottery Expenditure pc_{t-1}	-0.970	3.647	3.334
	(-0.43)	(0.79)	(0.69)
GDP pc_{t-1}	6.638***	-4.255*	-3.127
	(6.86)	(-1.72)	(-1.31)
Housing Price_{t-1}	-0.295	-2.202**	-2.254**
	(-0.58)	(-2.09)	(-2.10)
Population_{t-1}	-1.524	-1.499	-1.828
	(-1.41)	(-0.53)	(-0.62)
Inflation Rate_{t-1}	-0.040	0.425***	0.418***
	(-0.69)	(2.75)	(2.64)
Unemployment Rate_{t-1}	-0.000	-0.046*	-0.045*
	(-0.01)	(-1.77)	(-1.72)
Time Fixed Effects	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes
Observations	850	850	850
Adjusted R^2	0.914	0.905	0.905
F-Statistic	399.2		

Table 8: Effect of Lottery Prizes on Firm Creation: Spillovers

This table presents estimates of regressions of the entry rate of firms between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Spillover* $100km$, *Spillover* $150km$, and *Spillover* $200km$ are dummy variables that take a value of one if the center of a given province is within 100, 150 or 200 kilometers from the center of the winning province in each year, and zero otherwise. *Spillover 101-150km* is a dummy variable that takes a value of one if the center of a given province is between 101 and 150 kilometers from the center of the winning province in each year, and zero otherwise. *Spillover 151-200km* is a dummy variable that takes a value of one if the center of a given province is between 151 and 200 kilometers from the center of the winning province in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. $Inflation\ Rate$ is the growth of the CPI. *Unemployment Rate* is the unemployment rate. The sample covers the period 1992-2015 and excludes the three provinces that are islands. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Lottery Prize Dummy$_{t-1}$	0.854***	0.893***	0.929***	0.912***	0.920***
	(3.40)	(3.60)	(3.72)	(3.64)	(3.68)
Spillover 100km$_{t-1}$		0.442***			0.469***
		(2.71)			(2.76)
Spillover 150km$_{t-1}$			0.415**		
			(2.42)		
Spillover 200km$_{t-1}$				0.193*	
				(1.78)	
Spillover 101-150km$_{t-1}$					0.352
					(1.60)
Spillover 151-200km$_{t-1}$					-0.068
					(-0.38)
Lottery Expenditure pc$_{t-1}$	-4.316	-4.607	-4.763	-4.533	-4.769
	(-1.12)	(-1.20)	(-1.20)	(-1.14)	(-1.21)
GDP pc$_{t-1}$	-1.656*	-1.714*	-1.735*	-1.719*	-1.729*
	(-1.85)	(-1.94)	(-1.94)	(-1.91)	(-1.94)
Housing Price$_{t-1}$	-0.719	-0.725	-0.749	-0.736	-0.745
	(-1.52)	(-1.56)	(-1.61)	(-1.56)	(-1.61)
Population$_{t-1}$	0.199	0.207*	0.218*	0.215*	0.214*
	(1.66)	(1.73)	(1.83)	(1.80)	(1.80)
Inflation Rate$_{t-1}$	-0.086	-0.088	-0.087	-0.085	-0.088
	(-0.46)	(-0.47)	(-0.47)	(-0.45)	(-0.47)
Unemployment Rate$_{t-1}$	-0.001	-0.002	-0.002	-0.001	-0.002
	(-0.07)	(-0.09)	(-0.11)	(-0.08)	(-0.11)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,081	1,081	1,081	1,081	1,081
Adjusted R^2	0.903	0.903	0.904	0.903	0.904

Table 9: Effect of Lottery Prizes on Firm Outcomes

This table presents estimates of regressions of outcomes of firms created in year t at the firm level. Firm outcomes are the logarithm of assets, the logarithm of the number of employees, the logarithm of sales, the logarithm of value-added, the logarithm of wages, leverage (debt-to-assets ratio), and Z-score in year t, year $t+1$, year $t+2$, and year $t+4$. *Lottery Prize Dummy* is a dummy variable that takes a value of one for new firms incorporated in provinces that receive the maximum prize per capita in each year (treated firms), and zero for new firms incorporated in other provinces (control firms). The regressions include the same controls (coefficients not shown) as in Table 5. All regressions include province and time fixed effects. 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%, and 1% level, respectively.

		log(Assets)		
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.076*	0.050*	0.044**	0.060***
	(1.92)	(1.99)	(2.13)	(3.24)
Observations	392,434	319,760	239,806	167,055
		log(Employees)		
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.039***	0.025	0.018	0.054***
	(2.70)	(1.34)	(0.89)	(3.59)
Observations	184,246	144,653	107,705	70,100
		log(Sales)		
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.051***	0.088***	0.061*	0.113***
	(3.38)	(4.77)	(1.75)	(5.26)
Observations	168,471	145,044	112,501	75,442
		log(Value-Added)		
	Year t	Year $t+1$	Year $t+2$	Year $t+3$
Lottery Prize Dummy$_{t-1}$	0.069***	0.067***	0.063***	0.083***
	(4.23)	(3.88)	(2.78)	(2.86)
Observations	130,224	110,419	86,078	57,532
		log(Wages)		
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.020	0.014	-0.017	0.043**
	(1.29)	(0.57)	(-0.73)	(2.46)
Observations	249,075	202,570	152,426	100,338
		Leverage		
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.030	0.019**	-0.043	-0.070**
	(1.30)	(2.56)	(-1.29)	(-2.34)
Observations	71,059	57,344	44,949	32,420
		Z-score		
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	-0.216**	-0.008	0.044	-0.050
	(-2.42)	(-0.11)	(0.49)	(-1.02)
Observations	173,817	149,972	116,597	79,096

Table 10: Effect of Lottery Prizes on Firm Survival

This table presents linear probability model estimates of the survival rate defined as the probability that a firm created in year t survives at least 1, 2, 3, or 5 years at the firm level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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%, and 1% level, respectively.

	Survival ≥ 1	Survival ≥ 2	Survival ≥ 3	Survival ≥ 5
	(1)	(2)	(3)	(4)
Lottery Prize Dummy$_{t-1}$	-0.001**	0.001	0.005**	0.010***
	(-2.06)	(0.68)	(2.37)	(3.43)
Lottery Expenditure pc$_{t-1}$	-0.051*	-0.071	-0.154	-0.508***
	(-1.84)	(-1.07)	(-1.54)	(-3.41)
GDP pc$_{t-1}$	0.003	0.002	-0.016	-0.080***
	(0.69)	(0.19)	(-0.76)	(-3.09)
Housing Price$_{t-1}$	-0.007***	-0.009**	-0.010	-0.009
	(-4.00)	(-2.03)	(-1.19)	(-0.85)
Population$_{t-1}$	0.001	0.005	0.005	-0.014
	(0.42)	(1.02)	(0.39)	(-0.63)
Inflation Rate$_{t-1}$	0.000	0.001*	0.001	0.003
	(1.33)	(1.68)	(0.85)	(1.45)
Unemployment Rate$_{t-1}$	-0.000**	-0.000	-0.000	-0.001
	(-2.13)	(-1.01)	(-1.43)	(-1.37)
Time Fixed Effects	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes
Observations	274,392	274,392	274,392	274,392
Adjusted R^2	0.975	0.926	0.857	0.713

Table 11: Effect of Lottery Prizes on Firm Creation by Industry

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. Column (1) shows the results when we exclude firms in non-tradable industries. Column (2) excludes firms in both construction and non-tradable industries, and column (3) adds financial firms to that exclusion. Column (4) includes firms in non-tradable industries, and column (5) includes firms in tradable industries. Column (6) includes firms in manufacturing industries. Industries are classified as tradable or non-tradable following the Mian and Sufi (2014) classification. The regressions include the same controls (coefficients not shown) as in Table 5. 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%, and 1% level, respectively.

	Excluding Non-Tradable	Excluding Non-Tradable & Construction	Excluding Non-Tradable, Construction & Financial	Non-Tradable	Tradable	Manufacturing
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery Prize Dummy$_{t-1}$	0.856***	0.698**	0.656*	0.687*	0.681*	0.652**
	(3.06)	(2.05)	(1.96)	(1.95)	(1.78)	(2.33)
Lottery Expenditure pc$_{t-1}$	1.098	-4.825	-4.698	-6.508	2.479	6.304
	(0.19)	(-0.70)	(-0.68)	(-0.92)	(0.34)	(0.81)
GDP pc$_{t-1}$	0.655	-1.916	-2.071	1.671	-1.121	0.384
	(0.25)	(-0.72)	(-0.81)	(0.46)	(-0.37)	(0.13)
Housing Price$_{t-1}$	-1.037*	-0.670	-0.638	-1.462*	-1.423**	-1.646**
	(-1.68)	(-1.20)	(-1.15)	(-1.78)	(-2.19)	(-2.22)
Population$_{t-1}$	0.186	-1.015	-1.046	0.166	-0.104	2.100
	(0.07)	(-0.37)	(-0.39)	(0.05)	(-0.03)	(0.61)
Inflation Rate$_{t-1}$	0.071	0.062	0.054	0.022	-0.087	-0.146
	(0.42)	(0.38)	(0.34)	(0.09)	(-0.49)	(-0.76)
Unemployment Rate$_{t-1}$	-0.084***	-0.054**	-0.054**	-0.043	-0.035	-0.037
	(-3.14)	(-2.10)	(-2.16)	(-1.25)	(-1.03)	(-1.03)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,150	1,150	1,150	1,150	1,150	1,150
Adjusted R^2	0.913	0.913	0.912	0.887	0.869	0.861

Table 12: Effect of Lottery Prizes on Firm Creation: Financial Development

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. The low and high groups consist of provinces below and above the median of the distribution of number of bank loans per capita, average debt held by small and young firms (i.e., firms in the lowest quartile of assets during the first year of life), and number of bank branches in each province. The regressions include the same controls (coefficients not shown) as in Table 5. 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%, and 1% level, respectively.

	Bank Loans		Small and Young Firm Debt		Bank Branches	
	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery Prize Dummy$_{t-1}$	1.598***	0.147	1.079***	-0.056	0.754***	0.600
	(4.59)	(0.63)	(3.68)	(-0.19)	(3.07)	(0.86)
Lottery Expenditure pc$_{t-1}$	10.904	-10.939	7.192	-43.621	8.752*	-89.114***
	(1.43)	(-1.30)	(1.28)	(-1.62)	(1.98)	(-3.34)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	575	575	575	575	575	575
Adjusted R^2	0.937	0.936	0.923	0.938	0.923	0.942

Table 13: Effect of Lottery Prizes on Firm Creation: Municipality Level

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the municipality level. *Lottery Prize pc* is the lottery prize (in thousands of euros) per capita in each municipality and year. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita in each municipality and year. *Industrial Park Dummy* is a dummy variable that takes a value of one for municipalities that are both in the top decile of the number of tradable firms and in the top tercile of the number of tradable firms per capita, and zero otherwise. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. The macroeconomic controls are measured at the province level with the exception of population, which is measured at the municipality level. Columns (1) and (2) show the results for all firms. Columns (3) and (4) exclude firms in non-tradable industries. Columns (5) and (6) show results for firms in non-tradable indutries. Industries are classified as tradable or non-tradable following the Mian and Sufi (2014) classification. The sample covers the period 1992-2015. Robust t-statistics clustered at the municipality level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	All Firms		Excluding Non-Tradable		Non-Tradable	
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery Prize pc_{t-1}	0.029***	0.038***	0.019*	0.017*	0.282***	0.283***
	(3.20)	(3.58)	(1.74)	(1.65)	(3.96)	(3.98)
Lottery Prize pc_{t-1} × Industrial Park $Dummy_{t-1}$				0.640***		-0.201
				(3.26)		(-0.72)
Lottery Expenditure pc_{t-1}	-0.052***	-0.031***	-0.030***	-0.030***	0.007	0.007
	(-6.23)	(-3.97)	(-3.84)	(-3.84)	(0.92)	(0.92)
GDP pc_{t-1}		3.209	0.986	0.988	-0.664	-0.665
		(1.44)	(0.43)	(0.43)	(-0.26)	(-0.26)
Housing $Price_{t-1}$		-0.795	-0.759	-0.758	0.296	0.295
		(-1.05)	(-0.97)	(-0.96)	(0.32)	(0.32)
$Population_{t-1}$		9.354***	8.332***	8.331***	-4.741***	-4.741***
		(12.25)	(11.12)	(11.12)	(-6.33)	(-6.33)
Inflation $Rate_{t-1}$		-0.372*	-0.240	-0.239	0.414	0.414
		(-1.89)	(-1.10)	(-1.10)	(1.58)	(1.58)
Unemployment $Rate_{t-1}$		-0.069**	-0.080**	-0.080**	0.065	0.065
		(-2.03)	(-2.23)	(-2.23)	(1.57)	(1.57)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69,204	69,204	69,204	69,204	69,204	69,204
Adjusted R^2	0.584	0.587	0.520	0.520	0.104	0.104

Table 14: Effect of Lottery Prizes on Self-Employment

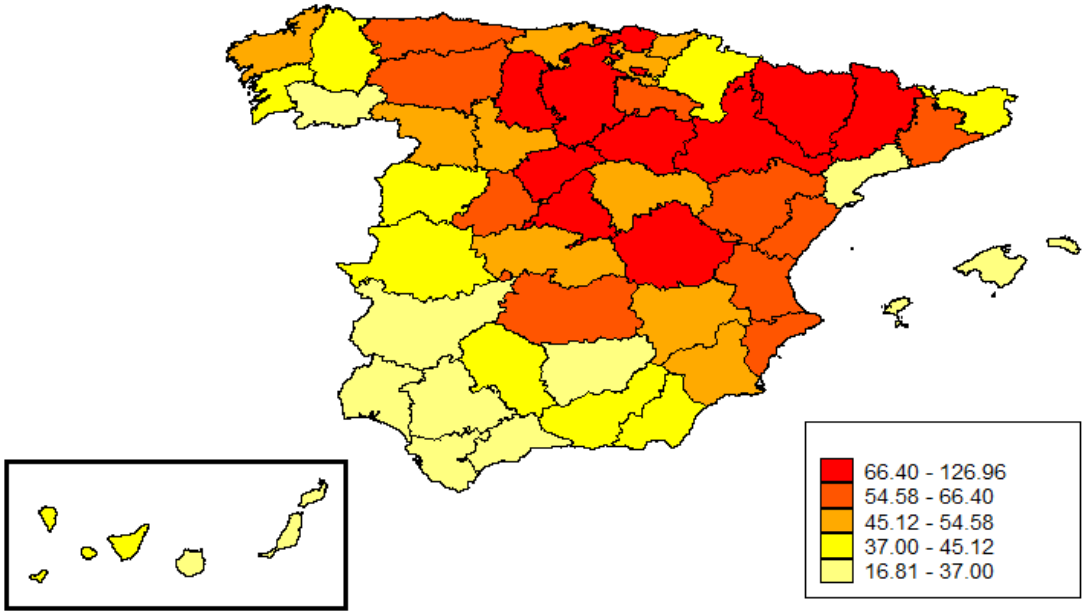
This table presents estimates of regressions of the growth rate of the number of self-employed individuals between year $t-1$ and year t (net entry rate) at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Lottery Prize Dummy$_{t-1}$	0.528**	0.611***	0.874**	0.724*	0.758***
	(2.00)	(2.74)	(2.49)	(1.94)	(3.16)
Lottery Expenditure pc$_{t-1}$	-14.207***	0.624	20.368***	17.615***	-1.210
	(-3.90)	(0.22)	(4.11)	(3.83)	(-0.28)
GDP pc$_{t-1}$		-2.021**		0.286	-2.158**
		(-2.46)		(0.10)	(-2.44)
Housing Price$_{t-1}$		1.008*		-3.048***	1.031*
		(1.90)		(-4.51)	(1.85)
Population$_{t-1}$		0.385**		-13.141***	0.297*
		(2.43)		(-4.23)	(1.69)
Inflation Rate$_{t-1}$		-0.057		0.166	-0.022
		(-0.27)		(0.73)	(-0.10)
Unemployment Rate$_{t-1}$		0.064**		-0.013	0.064**
		(2.53)		(-0.51)	(2.30)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	No	No	Yes	Yes	Yes
Sample	All	All	All	All	Excl. Madrid & Lleida
Observations	550	550	550	550	528
Adjusted R^2	0.655	0.714	0.774	0.788	0.708

Figure 1: Lottery Expenditure and Prize by Province

The map in Panel A shows the average lottery expenditure (in euros) per capita in each province. The map in Panel B shows the average lottery prize (top three prizes in euros) per capita in each province. The sample covers the period 1992-2015.

Panel A: Lottery Expenditure per capita (€)



Panel B: Lottery prize per capita (€)

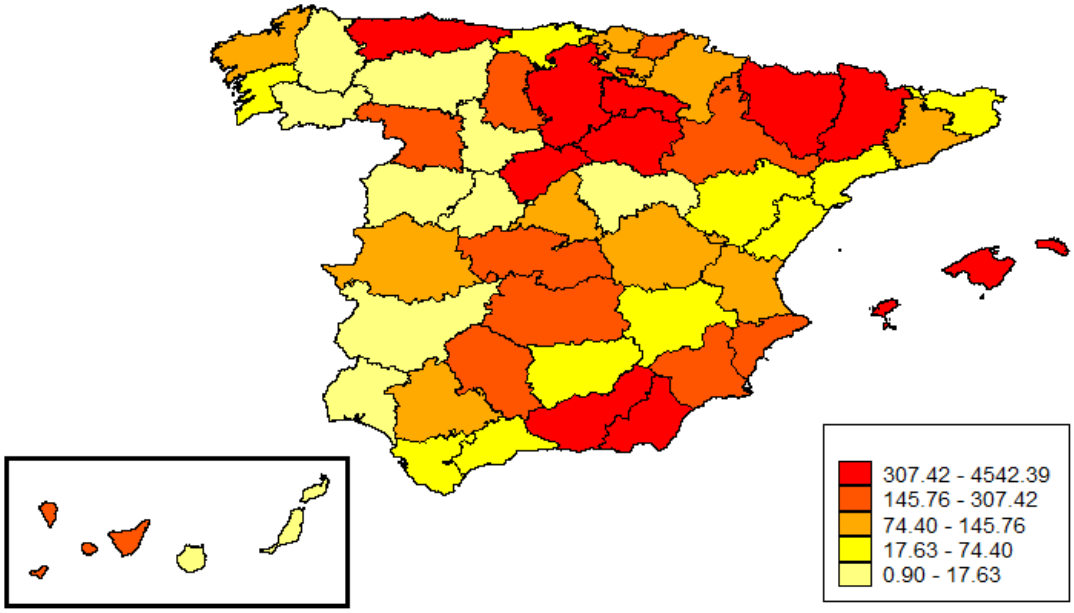
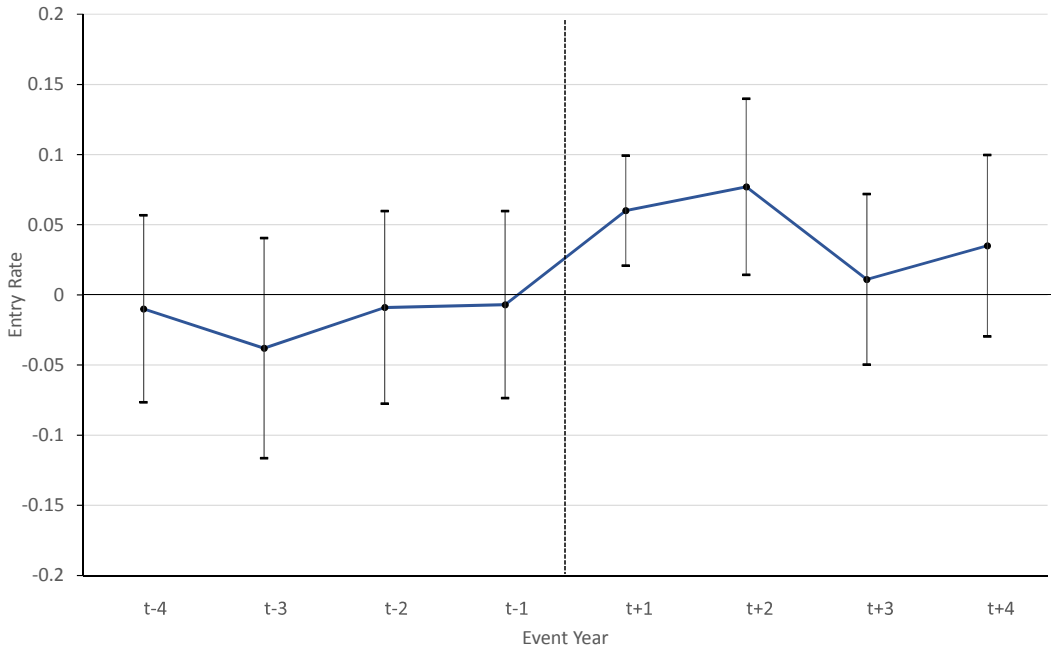


Figure 2: Effect of Lottery Prizes on Firm Creation

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 the number of new firms in each province in year t. The main explanatory variable is *Lottery Prize Dummy*, which is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. The regression includes four leads and four lags of the *Lottery Prize Dummy* variable (year t is omitted). The regressions include the same controls (coefficients not shown) as in Table 5. All regressions include province and time fixed effects. The sample covers the period 1992-2015. Robust t-statistics are clustered at the province level.



Internet Appendix for "Entrepreneurship and Regional Windfall Gains: Evidence from the Spanish Christmas Lottery"

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

In this Internet Appendix we provide additional statistics and robustness tests for the analysis in the main article. Specifically:

- Table IA.1: Summary Statistics of Self-Employment
- Table IA.2: Effect of Lottery Prizes on Firm Creation: Full Population
- Table IA.3: Effect of Lottery Prizes on Firm Entry and Exit
- Table IA.4: Effect of Lottery Prizes on Firm Entry Scaled by Population
- Table IA.5: Effect of Lottery Prizes on Firm Entry: Alternative Explanatory Variables
- Table IA.6: Effect of Lottery Prizes on Firm Outcomes: Instrumental Variables
- Table IA.7: Effect of Lottery Prizes on Firm Outcomes: Excluding Firms in Construction and Non-Tradable Industries
- Table IA.8: Effect of Lottery Prizes on Firm Creation: Economic Development
- Table IA.9: Effect of Lottery Prizes on Firm Creation by Legal Status
- Table IA.10: Effect of Lottery Prizes on Firm Creation: Capital Requirements
- Table IA.11: Lottery Prizes and Self-Employed Individuals Characteristics

Table IA.1: Summary Statistics of Self-Employment

This table reports mean, standard deviation, 25th-percentile, median and 75th-percentile of the number of self-employed individuals by province and category. The sample covers the period 1992-2015.

	Mean	Standard Deviation	25th Percentile	Median	75th Percentile	Observations
Total	41,075	43,387	18,592	30,158	44,643	600
Male	27,697	29,707	12,923	20,369	29,227	600
Female	13,377	13,928	5,766	10,065	14,532	600
Age < 25	861	922	319	617	988	600
Age 25-39	12,162	13,782	4,903	8,603	13,316	600
Age 40-54	18,130	18,617	8,176	13,633	19,914	600
Age >54	9,922	10,335	4,963	7,509	11,104	600
National	38,366	39,343	17,967	29,025	40,599	600
Foreigner	2,709	4,635	479	956	2,448	600
Employees=0	32,974	35,267	15,327	24,729	35,479	600
Employees>0	8,101	8,298	3,291	5,439	9,994	600
Pluriactivity=No	39,184	41,047	17,664	28,707	42,841	600
Pluriactivity=Yes	1,890	2,409	824	1,276	1,963	600
Agriculture	5,669	3,838	3,126	4,803	6,649	600
Manufacturing	2,183	2,609	936	1,463	2,461	600
Construction	5,105	5,870	2,236	3,358	5,827	600
Service	28,119	35,401	10,568	18,756	31,202	600

Table IA.2: Effect of Lottery Prizes on Firm Creation: Full Population

This table presents estimates of regressions of the net entry rate between year $t-1$ and t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. The sample covers the full population of firms in the period 1992-2015. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Lottery Prize Dummy$_{t-1}$	1.016*	0.682*	1.039***	0.859**	0.969**
	(1.99)	(1.75)	(2.93)	(2.30)	(2.21)
Lottery Expenditure pc$_{t-1}$	-40.968***	-5.502	34.488**	29.728***	39.310**
	(-3.65)	(-0.66)	(2.33)	(2.97)	(2.45)
GDP pc$_{t-1}$		-3.844		-6.758	-7.706*
		(-1.65)		(-1.55)	(-1.73)
Housing Price$_{t-1}$		1.475		-1.213	-1.087
		(1.27)		(-1.35)	(-1.13)
Population$_{t-1}$		1.245***		-5.604	-5.358
		(4.17)		(-1.16)	(-1.05)
Inflation Rate$_{t-1}$		0.196		0.663**	0.637*
		(0.72)		(2.16)	(2.00)
Unemployment Rate$_{t-1}$		0.102*		-0.119**	-0.125**
		(1.83)		(-2.26)	(-2.36)
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Province fixed effects	No	No	Yes	Yes	Yes
Sample	All	All	All	All	Excl. Madrid & Lleida
Observations	1,050	1,050	1,050	1,050	1,008
Adjusted R^2	0.800	0.839	0.912	0.916	0.915

Table IA.3: Effect of Lottery Prizes on Firm Entry and Exit

This table presents estimates of regressions of the logarithm of the number of new firms and the logarithm of the number of firms liquidated in year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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% and 1% level, respectively.

	log(Number of New Firms)			log(Number of Firms Liquidated)		
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery Prize Dummy$_{t-1}$	0.072***	0.072***	0.060**	-0.040	-0.038	-0.001
	(3.14)	(3.08)	(2.42)	(-0.55)	(-0.56)	(-0.02)
Lottery Expenditure pc$_{t-1}$	-0.295	0.015	-0.716	-2.314	-3.038	-6.530**
	(-0.30)	(0.02)	(-0.52)	(-1.03)	(-1.28)	(-2.08)
GDP pc$_{t-1}$		0.664***	0.564***		0.786	0.790
		(3.01)	(2.76)		(1.66)	(1.67)
Housing Price$_{t-1}$		0.030	0.072		0.208	0.154
		(0.29)	(0.66)		(1.16)	(0.84)
Population$_{t-1}$		0.292	0.159		-0.228	-0.348
		(1.58)	(0.90)		(-0.49)	(-0.71)
Inflation Rate$_{t-1}$		0.008	0.007		-0.017	-0.015
		(0.62)	(0.51)		(-0.64)	(-0.54)
Unemployment Rate$_{t-1}$		-0.006**	-0.006*		0.002	0.001
		(-2.03)	(-1.89)		(0.30)	(0.12)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	Excl. Madrid & Lleida	All	All	Excl. Madrid & Lleida
Observations	1,150	1,150	1,104	1,150	1,150	1,104
Adjusted R^2	0.978	0.979	0.976	0.975	0.975	0.975

Table IA.4: Effect of Lottery Prizes on Firm Entry Scaled by Population

This table presents estimates of regressions of the number of new firms in year t divided by population in $t-1$ at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Lottery Prize Dummy$_{t-1}$	0.134**	0.039	0.085**	0.073*	0.061**
	(2.10)	(0.65)	(2.44)	(1.95)	(2.03)
Lottery Expenditure pc$_{t-1}$	1.833	0.236	3.129*	1.381**	1.441
	(1.14)	(0.22)	(1.74)	(2.27)	(1.05)
GDP pc$_{t-1}$		0.740***		0.768**	0.621**
		(2.86)		(2.65)	(2.27)
Housing Price$_{t-1}$		-0.301**		0.095	0.121
		(-2.34)		(1.30)	(1.58)
Population$_{t-1}$		0.218***		-0.995***	-1.047***
		(6.52)		(-3.86)	(-3.88)
Inflation Rate$_{t-1}$		0.048		0.028	0.024
		(1.53)		(1.59)	(1.34)
Unemployment Rate$_{t-1}$		-0.014***		-0.010***	-0.011***
		(-2.80)		(-3.22)	(-3.50)
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Province fixed effects	No	No	Yes	Yes	Yes
Sample	All	All	All	All	Excl. Madrid & Lleida
Observations	1,150	1,150	1,150	1,150	1,104
Adjusted R^2	0.505	0.678	0.841	0.882	0.877

Table IA.5: Effect of Lottery Prizes on Firm Entry: Alternative Explanatory Variables

This table presents estimates of regressions of the entry rate of the number of firms between year $t-1$ and year t at the province level. *Lottery Prize pc* is the lottery prize (in thousands of euros) per capita. *Lottery Prize/GDP* is the lottery prize (in thousands of euros) divided by GDP. *Winning Tickets pc* is the number of winning tickets per capita. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. 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% and 1% level, respectively.

	(1)	(2)	(3)
Lottery Prize pc_{t-1}	0.275**		
	(2.23)		
Lottery Prize/GDP_{t-1}		0.067**	
		(2.24)	
Winning Tickets pc_{t-1}			0.296**
			(2.22)
Lottery Expenditure pc_{t-1}	0.302	0.355	-0.206
	(0.05)	(0.06)	(-0.03)
GDP pc_{t-1}	0.921	0.922	0.986
	(0.34)	(0.34)	(0.37)
$\text{Housing Price}_{t-1}$	-1.101*	-1.100*	-1.096*
	(-1.75)	(-1.74)	(-1.74)
Population_{t-1}	0.273	0.282	0.250
	(0.10)	(0.10)	(0.09)
$\text{Inflation Rate}_{t-1}$	0.077	0.077	0.075
	(0.46)	(0.46)	(0.45)
$\text{Unemployment Rate}_{t-1}$	-0.078***	-0.079***	-0.076***
	(-2.92)	(-2.93)	(-2.86)
Time fixed effects	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes
Observations	1,150	1,150	1,150
Adjusted R^2	0.920	0.920	0.920

Table IA.6: Effect of Lottery Prizes on Firm Outcomes: Instrumental Variables

This table presents estimates of the effect of disposable income on new firm outcomes using instrumental variables methods. The dependent variable in column (1) is total assets (in euros) of new firms divided by population in each province in year t. The dependent variable in column (2) is total sales (in euros) of new firms divided by population in each province in year t. The dependent variable in column (3) is total equity (in euros) of new firms divided by population in each province in year t. *Disposable Income pc* is the disposable income (in thousands of euros) per capita. *Lottery Prize pc* is the lottery prize (in thousands of euros) per capita. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. Columns (1)-(3) show the second-stage results of the regression of new firm outcomes on *Disposable Income pc* instrumented with *Lottery Prize pc* at the province level. The sample covers the period 1995-2010. Robust t-statistics clustered at the province level are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Assets pc	Sales pc	Equity pc
Disposable Income pc_{t-1}	44.655**	12.595**	27.121***
	(2.13)	(2.20)	(2.78)
Lottery Expenditure pc_{t-1}	84.828	47.496	179.801*
	(0.50)	(0.38)	(1.78)
GDP pc_{t-1}	-163.441	-86.501***	-123.981
	(-0.99)	(-2.59)	(-1.55)
Housing Price_{t-1}	103.704*	-6.432	25.194
	(1.91)	(-0.47)	(1.59)
Population_{t-1}	49.816	45.933	24.380
	(0.42)	(1.19)	(0.68)
Inflation Rate_{t-1}	9.198	2.973**	4.298*
	(1.12)	(2.37)	(1.83)
Unemployment Rate_{t-1}	2.285*	0.370	0.577
	(1.68)	(1.18)	(1.11)
Time fixed effects	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes
Observations	850	850	850
Adjusted R^2	0.671	0.818	0.419

Table IA.7: Effect of Lottery Prizes on Firm Outcomes: Excluding Construction and Non-Tradable Industries

This table presents estimates of regressions of outcomes of firms created in year t at the firm level. Firm outcomes are the logarithm of assets, the logarithm of the number of employees, the logarithm of sales, the logarithm of value-added, the logarithm of wages, leverage (debt-to-assets ratio), and Z-score in year t, year $t+1$, year $t+2$, and year $t+4$. *Lottery Prize Dummy* is a dummy variable that takes a value of one for new firms incorporated in provinces that receive the maximum prize per capita in each year (treated firms), and zero for new firms incorporated in other provinces (control firms). Industries are classified as tradable or non-tradable following the Mian and Sufi (2014) classification. The regressions include the same controls (coefficients not shown) as in Table 5. All regressions include province and time fixed effects. The sample excludes firms in construction and non-tradable industries and 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% and 1% level, respectively.

			log(Assets)	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.007	0.011	0.001	-0.011
	(0.15)	(0.41)	(0.04)	(-0.46)
Observations	210,673	170,978	128,661	88,236
			log(Employees)	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.042*	0.021	0.018	0.044**
	(1.91)	(0.90)	(0.92)	(2.36)
Observations	99,380	77,654	57,932	38,036
			log(Sales)	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.063**	0.085***	0.086***	0.128***
	(2.67)	(3.71)	(3.98)	(6.98)
Observations	97,008	83,736	64,524	42,958
			log(Value-Added)	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.067**	0.038	0.091***	0.077**
	(2.30)	(1.09)	(4.21)	(2.44)
Observations	71,896	60,817	47,239	31,603
			log(Wages)	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	0.028	0.001	-0.024	0.014
	(1.25)	(0.06)	(-1.06)	(0.61)
Observations	136,450	110,717	83,432	55,266
			Leverage	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	-0.019***	0.006	-0.099**	-0.133***
	(-2.72)	(0.27)	(-2.08)	(-3.18)
Observations	37,287	29,990	23,368	16,165
			Z-score	
	Year t	Year $t+1$	Year $t+2$	Year $t+4$
Lottery Prize Dummy$_{t-1}$	-0.273*	-0.084	0.028	0.023
	(-1.73)	(-0.47)	(0.31)	(0.31)
Observations	99,041	85,576	66,101	44,317

Table IA.8: Effect of Lottery Prizes on Firm Creation: Economic Development

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. The low and high groups consist of those provinces that are below and above the median of the distribution of GDP per capita, labor force participation, housing prices and car sales per capita in each province. The regressions include the same controls (coefficients not shown) as in Table 5. 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%, and 1% level, respectively.

	GDP pc		Labor Participation		Housing Price		Vehicle Sales	
	Low	High	Low	High	Low	High	Low	High
Lottery Prize Dummy$_{t-1}$	1.552***	0.524	1.242**	0.038	0.813*	-0.020	1.470***	0.280
	(2.90)	(1.66)	(2.44)	(0.17)	(1.99)	(-0.09)	(4.10)	(1.22)
Lottery Expenditure pc$_{t-1}$	-49.453	-6.254	6.942	-10.122	8.183*	-18.889	10.878	-9.091
	(-1.29)	(-1.37)	(0.78)	(-1.23)	(2.04)	(-1.29)	(1.28)	(-0.90)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	575	575	575	575	575	575	575	575
Adjusted R^2	0.939	0.931	0.929	0.936	0.948	0.934	0.928	0.937

Table IA.9: Effect of Lottery Prizes on Firm Creation by Legal Status

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. Column (1) presents estimates for the sample of limited liability companies and column (2) presents estimates for the sample of public limited companies. 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% and 1% level, respectively.

	Limited Liability Company (1)	Public Liability Company (2)
Lottery Prize Dummy$_{t-1}$	0.786***	0.196
	(2.72)	(1.55)
Lottery Expenditure pc$_{t-1}$	-6.310	4.176*
	(-0.96)	(1.72)
GDP pc$_{t-1}$	0.931	-0.336
	(0.31)	(-0.40)
Housing Price$_{t-1}$	-1.152*	-0.461**
	(-1.70)	(-2.65)
Population$_{t-1}$	-0.875	-0.061
	(-0.28)	(-0.08)
Inflation Rate$_{t-1}$	0.053	-0.033
	(0.25)	(-0.49)
Unemployment Rate$_{t-1}$	-0.070**	0.011
	(-2.04)	(1.04)
Time fixed effects	Yes	Yes
Province fixed effects	Yes	Yes
Observations	1,150	1,150
Adjusted R^2	0.932	0.751

Table IA.10: Effect of Lottery Prizes on Firm Creation: Capital Requirements

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. *Lottery Expenditure pc* is the lottery expenditure (in thousands of euros) per capita. *GDP pc* is the logarithm of GDP per capita. *Housing Price* is the logarithm of the housing price index. *Population* is the logarithm of the population. *Inflation Rate* is the growth of the CPI. *Unemployment Rate* is the unemployment rate. Column (1) presents estimates for the sample of industries with below median initial capital requirements and column (2) presents estimates for the sample of industries with above median initial capital requirements. The initial capital requirements are the average initial capital of newly created firms in each two-digit industry code. 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% and 1% level, respectively.

	Low Initial Capital (1)	High Initial Capital (2)
Lottery Prize Dummy$_{t-1}$	0.625***	0.174*
	(3.68)	(1.69)
Lottery Expenditure pc$_{t-1}$	3.034	-3.842
	(0.70)	(-1.43)
GDP pc$_{t-1}$	0.899	-0.369
	(0.52)	(-0.35)
Housing Price$_{t-1}$	-0.210	-0.705**
	(-0.52)	(-2.52)
Population$_{t-1}$	2.830	-2.944***
	(1.45)	(-3.05)
Inflation Rate$_{t-1}$	-0.041	0.090
	(-0.36)	(1.10)
Unemployment Rate$_{t-1}$	-0.042**	-0.024**
	(-2.23)	(-2.38)
Time fixed effects	Yes	Yes
Province fixed effects	Yes	Yes
Observations	1,150	1,150
Adjusted R^2	0.916	0.884

Table IA.11: Lottery Prizes and Self-Employed Individuals Characteristics

This table presents estimates of regressions of the growth rate of the number of self-employed individuals between year $t-1$ and year t (net entry rate) by gender, nationality, age, activity, and sector at the province level. *Lottery Prize Dummy* is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in each year, and zero otherwise. The regressions include the same controls (coefficients not shown) as in Table 5. All regressions include province and time fixed effects. 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.

Panel A: Individual Characteristics

	Gender		Nationality		Age			
	Male	Female	National	Foreigner	<25	25-39	40-54	>54
Lottery Prize Dummy$_{t-1}$	0.728***	0.385	0.714***	0.273	0.760	0.360	0.698*	0.578**
	(2.74)	(1.03)	(3.23)	(0.10)	(0.31)	(1.30)	(1.78)	(2.41)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550	550	550	550	550	550	550	550
Adjusted R^2	0.719	0.607	0.736	0.550	0.643	0.743	0.586	0.474

Panel B: Business Characteristics

	Employees		Pluriactivity		Sector			
	Employees=0	Employees>0	No	Yes	Agriculture	Manufacturing	Construction	Services
Lottery Prize Dummy$_{t-1}$	0.166	4.007**	0.600***	1.096	0.718	0.969***	0.845	0.599***
	(0.52)	(2.62)	(2.69)	(1.24)	(1.25)	(3.10)	(1.02)	(3.66)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550	550	550	550	550	550	550	550
Adjusted R^2	0.536	0.545	0.691	0.724	0.500	0.499	0.748	0.616