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

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Abstract

We study the effect of regional disposable income on entrepreneurial activity. Using the randomized assignment of monetary prizes provided by the Spanish Christmas Lottery as exogenous variation in regional disposable income, we find higher firm creation and self-employment in winning provinces. Our estimates imply that 46 new firms are created for every 1,000 euros increase in disposable income per capita. The effect is present in both the non-tradable and tradable industries. In addition, the effect is more pronounced in regions with lower economic, financial, and social development. Conditional on entry, firms created in winning provinces are larger, create more value-added, rely more on equity, and are more likely to survive in the long run. Our results suggest that aggregate demand, financial constraints, and regional development are important drivers of entrepreneurial activity.

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Keywords: Entrepreneurship, Firm creation, Regional income, Local demand, Financial constraints, Social-demographic, Economic activity, Self-employment

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1 Introduction

Promoting an entrepreneurial society is a priority shared by many governments worldwide as new firms are key to economic growth and job creation (Ayyagari, Demirguc-Kunt, and Maksimovic (2011), Haltiwanger, Jarmin, and Miranda (2013)). There are a variety of tools to encourage entrepreneurship including tax breaks to new businesses, reduction in red tape to set up new firms, and subsidized lending to start-ups and small businesses. At the same time, policy tools that target economic activity by increasing disposable income (e.g., reductions in personal income taxes, tax rebates, universal basic income) can also encourage business creation. While the costs of these policies are 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? What is the quality of the firms that are created as a result of shocks to income? The purpose of this paper is to answer these questions.

Measuring the effect of disposable income on firm creation is difficult because many of the variables that affect disposable income might also influence entrepreneurial activity. In this paper, we use exogenous variation in disposable income across provinces arising from the prizes paid by the Spanish Christmas Lottery. There are several features of this lottery that make it suitable for this study. First, the impact of the lottery prize is economically significant – the winning province (i.e., the province awarded with the maximum prize per capita in each year) receives an average income shock equivalent to 3.5% of its gross domestic product (GDP).[1] Second, the Christmas Lottery does not award one big prize to a few individuals, which would be a concern as the distribution of the income shock would be different from that generated by typical policy tools. Rather, the lottery prize is distributed among several thousand individuals sharing the same ticket number.[2] Third, lottery winners

[1] The provinces where the second and third top prizes are sold 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 via minor prizes, approximately 0.1% of GDP.

[2] According to the survey data, 87% of the individuals who participate, syndicate play. They share their tickets with relatives (64%), friends (33%), or co-workers (28%). Lottery winners also plan to share the prize with their families.

are geographically concentrated. Bagues and Esteve-Volart (2016) show that prizes are collected during the same year and in the province where the tickets were sold. This generates significant variation in prizes across provinces. Fourth, lottery players are likely to be "average" individuals since the Christmas lottery is a social event in which 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 province expenditure on lottery tickets. It is important to condition on lottery expenditures since, unconditionally, the probability of winning could be correlated to entrepreneurship. This correlation could arise if, for example, the conditions that lead people to buy lottery tickets are the same that encourage entrepreneurship. In this case, more entrepreneurial provinces would have more tickets and hence would be more likely to win. Indeed, we show that the probability of winning is a function of observables, such as provincial GDP per capita. However, after we control for lottery expenditures, no macroeconomic variable has any explanatory power to predict the winning province. Thus, the lottery seems to provide truly exogenous variation in disposable income after controlling for lottery expenditures.

Our first set of results are from reduced form regressions. We find that the regional windfall gains due to the lottery have a significant effect on entrepreneurial activity. The number of new businesses significantly increases in winning provinces. The effect is economically sizable: the percentage of new firms as a function of existing firms (entry rate) in winning provinces increases by about 0.9 percentage points compared to non-winning provinces in a given year. Considering that the average entry rate is 9% in our sample period, the effect of the income shock represents about 10% of the average. In addition, we do not find a significant effect on the exit rate. This is consistent with the idea that, while some incumbents suffer increased competition from the new businesses, they might also benefit from the increase in local demand.

We analyze how the lottery prize affects the dynamics of firm creation over time. The

rate of firm creation increases at about the same rate in 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 the lottery prize is awarded.

Our main result is to provide an estimate of the response of entrepreneurial activity to income shocks. While high regional income implies an increasing market size and therefore broader opportunities for new firms, a high-income level may deter entrepreneurial activity due to high labor costs. We instrument shocks to disposable income using the size of the lottery prize (per capita) in each province. Our first stage confirms the results in Bagues and Esteve-Volart (2016) that one euro of lottery prize translates into 87 cents of disposable income. The second stage regression implies that a €1,000 increase in disposable 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 of disposable income per capita.[3]

We compare the response to the income shock across types of industries. The effect on firm creation is positive and significant for businesses operating in industries that depend on local demand (i.e., non-tradable industries). This result indicates that higher aggregate demand in the local economy leads to firm creation. However, the effect on firm creation is also positive and significant in tradable and manufacturing industries with a similar magnitude to that in non-tradable industries. Since 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 could also help to explain our results.

Prior studies have long observed that entrepreneurial activity tends to vary systematically across regions (Carlton (1983)). In searching for a theoretical framework to provide a lens through which spatial variation of entrepreneurship could best be interpreted and explained, researchers have gravitated towards models highlighting the extent to which

[3] A €1,000 increase in disposable income per capita implies an increase of €45 in firms' assets, €13 in firms' sales and €27 in firms' equity in the winning province.

entrepreneurial opportunities prevail or are impeded within a spatial context. This has generated an exhaustive literature linking region-specific characteristics that either promote or impair entrepreneurial opportunities to various measures of regional entrepreneurship. Most notably, region-specific measures, such as growth, unemployment, population density, and industry structure have been found to influence the extent of entrepreneurial activity within a geographic space. The heterogeneity among Spanish provinces makes our sample an ideal laboratory to examine the effect of disposable income on entrepreneurship for different levels of financial, economic, and social development. We find that the effect of the lottery prize on entrepreneurship is larger in provinces with lower access to credit, in particular for small, new firms. In addition, we find a more pronounced effect in provinces with lower levels of economic and social development.

Using firm-level data, we examine whether conditional on entry, variation in lottery prizes affects firm outcomes at creation and up to five years after creation. We find that firms created as a response to the income shock are significantly larger (as proxied by assets, number of employees and sales) and create more value-added. 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. Furthermore, new businesses created in winning provinces seem to rely more on equity financing. We also examine the survival of firms created due to the lottery income shock. We find that firms created in winning provinces have higher survival rates than firms created in non-winning provinces. We conclude that firms created due to the income shock are of better quality.

Finally, as an alternative measure of entrepreneurship, we study 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 growth rate of the number of self-employed individuals in winning provinces increases by about 0.7 percentage points compared to non-winning provinces in a given year.

Our study contributes to three strands of the literature. First, our paper contributes 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 sector), 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 firms created as a response to an increase in local demand is mainly driven by young and skilled individuals. Our paper contributes to this literature by exploiting the random income shock generated by the Christmas Lottery in order to deal with the endogeneity of economic conditions. We provide causal evidence that local economic opportunities due to an increase in aggregate demand spur entrepreneurial activity.

Second, we contribute to a growing literature that uses lottery data as an exogenous (unearned) income shock to study a number of individual decisions. This literature focuses on the effects of lottery prizes on labor supply (Imbens, Rubin, and Sacerdote (2001), Cesarini, Lindqvist, Notowidigdo, and Ostling (2017)), individual bankruptcy (Hankins, Hoekstra, and Skiba (2011)), and consumption (Kuhn, Kooreman, Soetevent, and Kapteyn (2011)). In addition, Bagues and Esteve-Volart (2016) use the Spanish Christmas Lottery to study the effect of economic conditions on election outcomes. Our lottery setting has several advantages to study the effect of shocks to disposable income over other settings such as changes in personal income taxes. First, the lottery is played every year, whereas tax policy changes are infrequent. Second, the lottery is played irrespectively of economic conditions, whereas it is likely that tax changes are enacted conditional on actual and expected economic conditions. Finally, the lottery allows us to use a cross-sectional variation as lottery prizes vary by province while finding this source of cross-sectional variation in tax changes is more difficult. A caveat of our lottery setting is that the results may not be the typical response to other forms of unearned income. However, two key aspects of the Christmas Lottery differ from other lotteries – it is a social event and an income shock to several thousand households in the

same geographic area. Thus, the Christmas Lottery provides a unique setting to study how improvements in the economic conditions of a local community affect entrepreneurial activity.

Finally, 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), Holtz-Eakin, Joulfaian, and Rosen (1994)). However, Hurst and Lusardi (2004) report that only for individuals at the very top of the wealth distribution there is 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 and growth using variation in house prices as shocks to the value of real estate collateral. These studies identify the effect of liquidity by comparing full homeowners with partial homeowners and renters as only full owners can fund their venture using their houses as collateral to borrow. These two groups, however, may differ in characteristics such as ability and risk aversion, which are important determinants of entrepreneurship. Our paper adds 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.

2 Christmas Lottery

The Spanish Christmas Lottery (*Lotería del Gordo*) is a national lottery game that has been held since 1812. Nowadays, this lottery is held every year on December 22 and is 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 participate with 80% of the participants between 25 and 44 years old with a college degree, and

around 70% of them do not play other lotteries. The amount of money spent is similar across individuals, with 70% of individuals spending less than €60 and only about 8.5% spending 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 that are allocated to each outlet are randomly assigned. Each number is divided into 165 series, each of these series consists of 10 fractions, and each of these fractions can be divided in up to 10 shares. Thus, depending on the number of shares sold, there could be between 1,650 and 16,500 ticket holders for each number. The price of a fraction is €20, so currently, the cost of buying an entire number is €33,000. One ticket usually corresponds to one fraction. People

The amount of money assigned to prizes is 70% of the money collected (i.e., €2,320 million). The remaining 30% is distributed as commissions for the outlet, 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 awarded ticket of €20 represents approximately 10 times the average household income (€32,000) and a bit more than the average level of assets held by the average Spanish household (€257,000).

3 Data

3.1 Data Sources

We obtain data on monetary awards and on expenditure on the Christmas Lottery for each of the 50 provinces in Spain from "Sociedad Estatal Loterias y Apuestas del Estado". Our sample covers from 1992 to 2015. We observe the province where tickets receiving the top

[4]These 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 the lottery prizes were tax exempt until 2013, in which a 20% tax was imposed for prizes larger than €2,500. See Bagues and Esteve-Volart (2016) for more details about the Christmas Lottery players' characteristics.

three prizes were sold, as well as the total number of tickets sold in each province. We code a winning province by the location of the outlet that sold the winning number. A concern is whether players may buy tickets outside of their residence or exchange tickets with people in their network who live in other provinces. However, using National Accounts statistics, Bagues and Esteve-Volart (2016) show that 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 contains detailed firm-level characteristics and financial data. In addition, Amadeus also provides information on year of incorporation, industry (the three-digit NACE code—the European standard of industry classification) and the province where the firm is located. The other source of information is the Sabi database, an enhanced version of Amadeus for Spain. Sabi is useful because it covers a larger fraction of new and small firms across all industries, and contains information not only on active firms but also on firms that have been already liquidated.[5]

We also obtain information on macroeconomic variables at the province level from 1992 to 2015. The data on disposable income, gross domestic product (GDP), consumer price index (CPI), unemployment, and population are from INE.[6] Data on loans and bank branches are from the Bank of Spain and data on house prices are from several sources.[7] In addition, we obtain data on self-employed individuals and their characteristics from the Ministry of Labor and Social Security.

[5]We perform robustness tests using data aggregated at the province level from the Spanish Central Directory of Enterprises (Directorio Central de Empresas, DIRCE). The data are compiled by the Spanish National Statistics Office (Instituto Nacional de Estadistica, INE) 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.

[6]Data on disposable income is only available for the period 1995-2010.

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

3.2 Summary Statistics

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

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

Figure 1 shows the average lottery expenditure per capita (Panel A) and prize per capita (Panel B) by province during our sample period. There is variation both in terms of the location of provinces in the treatment group and the intensity of the treatment across Spain. Our empirical setting exploits this variation.

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

Table 2 compares averages of the outcome variables across winning and non-winning provinces. The variables are lagged one year to compare these provinces prior to the realization of the lottery. Winning provinces are provinces 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 over the number of existing firms (entry rate), the number of firms liquidated over the number of existing firms (exit rate), and the number of self-employed individuals. Overall, there are no significant differences between the winning and non-winning provinces.

Table 3 reports average characteristics of new firms. We report 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 the probability of default (as proxied by the Z-score). The average new firm has 499 thousand euros of assets, 7 employees, 132 thousand euros of value-added, total wages of 51 thousand euros, a debt-to-assets ratio of 0.52, and a Z-Score of 2.5. Table A1 in the Internet Appendix reports summary statistics for self-employed individuals including the breakdown by characteristics such as gender, nationality, age, number of employees, and sector.

4 Empirical Strategy

We use exogenous variation in disposable income arising from lottery prizes to estimate the effect of disposable income on entrepreneurial activity. Clearly, a simple ordinary least squares (OLS) regression of disposable income on entrepreneurial activity would deliver biased estimates as many unobserved variables could drive both. Instead, we estimate reduced form regressions of entrepreneurial activity on winning province status in Section 5.1 and 2SLS models using the lottery prize per capita as an instrument for disposable income in Section 5.2. In this section we discuss the validity of our instrument focusing on the exclusion restriction.

The exclusion restriction for this empirical strategy requires that the lottery prize impacts 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 that encourage entrepreneurship. Table 4 shows this is a real possibility. We estimate a linear probability model of the lottery prize variable (i.e., a dummy variable that takes the value of one for the winning province and zero otherwise) on several macroeconomic variables. Column (1) shows that GDP per capita 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 per capita, 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, since 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, when we control for lottery expenditure, the GDP per capita is no longer significant in column (2). Columns (3) and (4) show that no other macroeconomic variable has any power predicting the winning province when we control for total expenditures in the lottery at the province level. We conclude that the lottery prize seems to provide truly exogenous variation in disposable income after controlling for total lottery expenditure.[8]

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. We also examine whether the effect of the lottery prize on entrepreneurship is heterogeneous across industries and provinces with different levels of economic, financial and social development.

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

5.1 Firm Entry and Exit

We examine the effect of the random income shock generated by the Christmas Lottery on entrepreneurship. 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 over the number of existing firms in year $t-1$) in province j or the exit rate (number of firms liquidated in year t over the number of existing firms in year $t-1$); $\textit{Lottery Prize Dummy}_{j,t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise;[9] $\textit{Lottery Expenditure pc}_{j,t-1}$ is the expenditure per capita in the lottery in year $t-1$ in province j; $Z_{j,t-1}$ includes the logarithm of the GDP per capita, the logarithm of house prices, the unemployment rate growth, the inflation rate, and the logarithm of the population in province j;[10] δ_j is a province fixed effect and δ_t is a time fixed effect. The coefficient of interest β measures the average difference in the entry rate or exit rate between winning provinces and non-winning provinces.

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 relative to non-winning provinces. The regression in column (1) controls for the lottery expenditure and time fixed effects. The coefficient of interest β is 0.65, which indicates that the entry rate in winning provinces is

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

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

0.65 percentage points higher than in non-winning provinces.

Results are robust to the inclusion of additional control variables (column (2)) and province fixed effects (column (3)). In particular, column (3) includes province fixed effects, which controls for unobserved time-invariant province heterogeneity and therefore the estimator is solely driven by within-province variation. The estimate in column (3) indicates that the entry rate increases about 0.86 percentage points more for winning provinces than non-winning provinces. Given that the average entry rate is about 9% in our 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 Madrid and Lleida from the sample, which are provinces with special characteristics.[11]

Tables 6 shows the results for the exit rate. We do not find a significant effect of the lottery prize on the exit rate, although the coefficient is consistently negative. This negative coefficient indicates that firm exit is lower in winning provinces. Only in column (5), which includes province fixed effects and controls, and the sample excludes Madrid and Lleida, we find a negative and significant effect. The effects of the lottery on the exit rate are twofold. In the one hand, the lottery prize increases firm creation and 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 equation (1) with four lags and four leads of the dummy variable *Lottery Prize Dummy*. 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. We find a significant increase in the number of new firms created in the two years after the lottery in winning provinces relative to non-winning provinces. In addition, we find that

[11] Madrid is the capital and biggest city in Spain and can exhibit unique features such as higher lottery expenditure and economic activity. The province of Lleida includes a city called Sort that has a strong Christmas Lottery tradition and spends a high amount in this lottery (around 3% of total sales).

treatment and control groups follow parallel trends before the lottery prize is awarded (the treatment), mitigating concerns about preexisting differential trends.

We perform robustness checks of our primary findings. Table A2 of the Internet Appendix shows that the net entry rate (i.e., growth rate of the number of firms) results are similar to the entry rate results in Table 5 when we use the full population of firms (at the province level) provided by the Spanish National Statistics Office. Table A3 reports consistent estimates to 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. Table A4 shows that the results are also robust when we scale the number of new firms by population, rather than by the number of firms.

We now consider a continuous explanatory variable to measure the effect of the lottery prize on firm creation. We use the lottery prize in euros thousand per capita (*Lottery Prize pc*), lottery prize in euros thousand scaled by GDP (*Lottery Prize/GDP*), and the number of winning tickets per capita (*Winning Tickets pc*). Table A5 of the Internet Appendix shows that the effect on the entry rate is positive and significant in the three cases. In particular, column (1) indicates that if a province is awarded €1,000 in the lottery prize, the entry rate increases by 0.28 percentage points. Since the average number of firms in a province is around 15,908, the 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 presented so far are informative about the effect of lottery prizes on entrepreneurial activity. While interesting on their own right, they cannot be generalized beyond the Spanish setup. The estimate of the effect of disposable income on new business start-ups, however, can be generalized. To achieve this goal, we implement instrumental variables (IV) methods using two-stage least squares (2SLS) regressions. In the first stage, we predict disposable income per capita (in euros thousand) in each province with the lottery prize per capita (*Lottery Prize pc*). In the second-stage regressions, the dependent variables

are the entry rate.

Table 7 shows ordinary least squares (OLS) and instrumental variables (IV) estimates. Column (1) is a regression of the entry rate on disposable income per capita (without instrumenting disposable income with the lottery prize). We find a positive and significant correlation between firm entry and disposable income. This regression suffers from reverse causality problems, however, an increase in disposable income is significantly associated to an increase in firm creation.

Column (2) shows the first-stage results in which we regress disposable income per capita on the lottery prize instrument (*Lottery Prize pc*). Importantly, the first stage regression includes the total expenditure on lottery tickets at the province level. We find that disposable income per capita increases by 87 cents for every Euro of lottery prize. The F-statistic of this first-stage regression is 399.17, well above the conventional threshold for weak instruments (Stock and Yogo (2005)). Column (3) shows the second-stage results in which disposable income per capita is instrumented with the lottery prize per capita. We find that a €1,000 increase in disposable income increases the entry rate by 0.29 percentage points. The magnitude of the estimate in column (3) is similar to the OLS estimate (in column (1)) and reduced-form estimate (in Table A5). The 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.

In Table A6 of the Internet Appendix we use alternative dependent variables in which we aggregate accounting 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. We use this aggregate amount of assets as dependent variable and use the same specification as in column (3) of Table 7. A €1,000 increase in disposable income per capita is translated into an aggregate increase of €45 in firms' assets, €13 in firms' sales and €27 in firms' equity.

5.3 Heterogeneous Effects

The entrepreneurial activity is affected by the interaction of two sets of factors: personal (micro) factors and environmental (macro) factors. While much of the literature on entrepreneurship has focused on the characteristics of an individual to become an entrepreneur, less attention has been devoted to how these individuals respond to changes in economic conditions under different environmental factors. In this section, we examine whether the effect of the lottery prize on entrepreneurship is heterogeneous across industries and provinces with different levels of economic, financial and social development.

5.3.1 Entrepreneurial Activity across Sectors

We 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) and industries that depend less on local demand (i.e., tradable) following Mian and Sufi (2014). If the effect of the lottery prize on firm creation is solely a consequence of an increase in local demand (i.e., not the effect of financial constraints) the effect should be significantly reduced in tradable industries. In contrast, if financial constraints impair firm creation, we should also find a significant effect in tradable industries. To analyze this hypothesis, we use equation (1) and estimate the relation between the lottery and firm creation across different industries.

Table 8 shows that our estimates for the tradable sector are of similar magnitude to 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 0.70 percentage points when we exclude the construction sector. We exclude the construction and the non-tradable sectors in column (2) and also exclude the financial sector in column (3). The effect of the lottery on the entry rate is slightly reduced to 0.66 but it is still positive and significant. Column (4) shows that the effect is positive and significant at 0.69 in the non-tradable sector. Columns (5) and (6) focus on the tradable and manufacturing sectors respectively. We find the impact of the lottery on firm creation remains positive and significant in the tradable and manufacturing sectors at 0.65-0.68. Moreover, the magnitude of the effect is similar in the non-tradable and tradable sectors. We conclude that

our results are not solely driven by firms in the non-tradable sector or in the construction sector. This finding is consistent with financial constraints also playing an important role in firm creation.

5.3.2 Entrepreneurial Activity and Start-up Capital

We also study whether there are differences in the type of firms created after the lottery prize is awarded based on legal status and capital requirements. We estimate equation (1) separately for different types of firms. We first study the importance of financial constraints for firm creation by exploiting the 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 higher start-up capital, which is probably too high to be financed with lottery prizes.[12] Table A7 in the Internet Appendix shows the 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 in the entry rate for limited liability companies, i.e., when the start-up capital is lower. This result is consistent with the financial constraints hypothesis as firms that require less capital to start are those that benefit the most from the lottery prize. The effect on the entry rate of public limited companies is insignificant and much smaller in magnitude, as the size of the lottery prize is not sufficiently large to meet the capital requirements of public limited companies.

In Table A8 of the Internet Appendix we study the effect of the lottery on firm creation by splitting 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. We find a stronger effect of the lottery prize on firm entry in the sample of industries with lower initial capital requirements. These results suggest that firms with lower initial capital requirements, which are more likely to be financially constrained, are those that benefit the most from the income shock. Our findings are also consistent with the notion that banks are often reluctant

[12] 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.

to finance start-ups because of high uncertainty, information asymmetry, and agency costs (Beck, Demirgüç-Kunt, and Maksimovic (2005)).

5.3.3 Entrepreneurial Activity and Financial Development

We analyze the role of financial development and access to credit on the effect of the lottery prize on entrepreneurship. It could be that financing constraints create economically meaningful barriers preventing entrepreneurs to take advantage of investment opportunities. We use the number of bank loans per capita, the amount of debt held by small and young firms, and the number of bank branches by province as a measure of local access to credit. The debt held by small and young firms is the average amount of debt of small firms (i.e., firms in the lowest quartile of assets) during their first year of life in each province. We use equation (1) and split the sample into provinces with low and high access to credit based on the median of each of these three variables. Table 9 shows that the estimate of the *Lottery Prize Dummy* coefficients are significantly larger for the sample with the below-median number of bank loans per capita, the average amount of debt held by young small firms, and the number of bank branches. These results indicate that the effect of the lottery prize on entrepreneurship is larger in provinces with lower access to credit. This result suggests that the lottery prize has a stronger effect on business creation in regions with lower financial development and access to credit. In addition, the results are consistent with the hypothesis that financial constraints play an important role in shaping the effect of the lottery prize on entrepreneurship.

5.3.4 Entrepreneurial Activity and Economic Development

The role played by economic development in explaining entrepreneurial activity has two contrasting effects. First, the rate of regional unemployment evaluates the existence of a refugee effect, i.e., a positive relationship may be observed between unemployment and entrepreneurship. When the number of salaried jobs becomes rare, the creation of one's own job becomes a more attractive solution than in a situation where there are many jobs

(Parker (2005)). Second, lower levels of economic development may be associated with relatively low levels of demand for the output of the self-employed, and therefore, we could observe a negative effect on entrepreneurial activity.

We analyze whether the impact of the exogenous income shock on entrepreneurship is heterogeneous across provinces with different levels of economic development. We split the provinces by the median value of GDP per capita, labor force participation, housing prices and vehicle sales per capita. Table 10 shows the results. We find the effect of the lottery on entrepreneurship is more pronounced in provinces with lower economic development. This indicates that firm creation increases significantly more following income shocks in provinces with economic slack.

We also study whether there is a significant impact of the lottery on macroeconomic indicators such as GDP per capita growth, house prices growth, unemployment rate growth, inflation rate, and population growth in the years after the lottery prize is awarded. Table A9 of the Internet Appendix presents the results. At the province level, we do not find any significant impact of the lottery on macroeconomic indicators with the exception of the inflation rate. These results are in line with Bagues and Esteve-Volart (2016). They claim that this is because provinces in Spain have a high openness ratio (proxied by trade-to-GDP ratio, defined as the sum of exports and imports divided by GDP). According to Bagues and Esteve-Volart (2016), the openness ratio of the average Spanish province between 1995 and 2007 was equal to 168% (C-Intereg database).

To better understand whether economic openness is important to explain the effects of the lottery on the local economy, we split our sample into low and high economic openness. Table A10 shows that the impact of the lottery prize on GDP growth is not significant in the years after the lottery prize is awarded, but the coefficients in the provinces with a low openness ratio are larger than in the provinces with high openness ratio. There is a significant decrease in the unemployment rate following the lottery prize in provinces with a low openness ratio, while the effect is insignificant in provinces with a high openness ratio. Overall, this is evidence that the local demand shock due to the income shock is not sizable

enough to impact macroeconomic indicators. This evidence is consistent with the notion that local demand shocks do not drive all the results, and financial constraints also play a role in explaining the effect of windfall gains on entrepreneurship.

5.3.5 Entrepreneurial Activity and Social Development

A set of interrelated conditions is likely to hinder entrepreneurship in disadvantaged areas. These obstacles influence both the extent and form of entrepreneurial activity. They also affect the likelihood that new firms, once established, will survive. Impediments to entrepreneurship in deprived communities are seen to include low education, delinquency, or poor urbanization economies. While these obstacles are not exclusive to deprived localities, their prevalence, the likelihood that they will operate simultaneously, and their severity are often greater in poorer communities. Therefore, we would expect individuals in less developed regions to have a larger entrepreneurial response when there is an improvement in their local economic conditions.

Inspired by the theories of new economic geography, population density is a key factor in explaining entrepreneurship. These agglomeration effects, including spillovers and demand effects, may favor entrepreneurial activity. Indeed, spillover effects may appear through pooled labor markets, non-pecuniary transactions or information spillovers. But beyond a threshold, diseconomies of agglomeration such as competition may occur. Urbanization economies are more general spillovers favored by the proximity of other firms or households. Armington and Acs (2002) show that both population density is positively related to firm start-ups in the US. Spain is known to be a country with both highly urbanized and rural regions. Human capital is another important firm creation determinant, and its effect on entrepreneurial activity is not clear. On the one hand, a high regional educational level should stimulate start-up activity as high graduate people can be better at discovering and exploiting entrepreneurial opportunities. But, on the other hand, the high graduates can prefer to choose a paid work as they face little risk of unemployment and high-income levels.

We study whether the effect of the lottery prizes on firm creation varies across provinces

with different levels of social development. We split provinces according to the median of several social development indicators: education (proxied by the proportion of illiterate population), delinquency (proxied by the number of violent death per capita), population density, and tourism (proxied by hotel capacity per capita). Table 11 shows that the effect of the lottery prize is more pronounced in provinces with higher delinquency, lower population density (rural areas), and lower tourism capacity. On the other hand, education does not seem to play a major role. In general, these results suggest that the entrepreneurial effect of an increase in disposable income is more significant in less developed regions.

6 Firm Outcomes and Survival

In this section, we analyze the effect of the income shock on the outcomes of newly created firms, conditional on entry.

We estimate the following regression of outcomes of firms created in year t:

$$\begin{aligned} Y_{i,j,t+n} = \beta_n &Lottery\ Prize\ Dummy_{j,t-1} + \theta_n Lottery\ Expenditure\ pc_{j,t-1} \\ &+ \gamma_n Z_{j,t-1} + \delta_j + \eta_t + \varepsilon_{i,j,t+n} \end{aligned} \tag{2}$$

where $Y_{i,j,t+n}$ is the logarithm of assets, logarithm of number of employees, logarithm of sales, logarithm of value-added, leverage (as measured by the debt-to-assets ratio), or the probability of default (as proxied by the Z-score) of firm i located in province j in year $t+n$.[13] $Lottery\ Prize\ Dummy_{j,t-1}$ is a dummy variable that takes a value of one for new firms incorporated in provinces awarded with the maximum prize per capita in year $t-1$ (treated firms), and zero for new firms incorporated in other provinces (control firms). 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 by performing a within-province analysis. Thus, we compare the characteristics of new firms created in the same province.

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

Table 12 presents the 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 the lottery prize on the size of new firms as proxied by assets, the number of employees, and sales, conditional on entry. We also find that the lottery prize has a positive and significant effect on the value-added created by new firms in winning provinces. The effects on the size and value-added of new firms can be observed at creation and up to four years after creation. We conclude that new firms created as a response to the lottery prize are larger and more productive at creation, and remain larger and more productive in the long run. In terms of capital structure, we do not find a clear pattern between an average new firm and those created in winning provinces. In addition, new firms seem to be less risky at creation but differences are statistically insignificant in the post-entry period.

Table A11 of the Internet Appendix presents the effect on new firms' outcomes when we focus on the tradable sector. We find similar results than in other sectors except in the capital structure of these new firms. In this case, we find that firms created after the lottery prize is awarded rely more on equity capital as a financing source. This is consistent with our conjectures that individuals aiming to start-up riskier businesses (i.e., those that do not depend on local conditions), seem to be facing financial constraints that are alleviated when either them directly, or individual on their network, receive an income shock. Overall, our results show that when the economic conditions of a region improve, entrepreneurs use more equity financing when starting a business that does not depend on the local demand. These results suggest that the lottery prize helps to alleviate financial constraints and provide equity to start a business.

We next examine the effect of the lottery prize 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). We estimate a linear probability model at the firm level.

Table 13 presents the estimates. We find that firms created in winning provinces versus

non-winning provinces have a significantly higher probability of surviving for at least three or five years. The estimates show that a firm created in a winning province has a probability of surviving for five years 1 percentage point higher than in a non-winning province. Our findings suggest that firms created due to the income shock are of better quality as they are more likely to survive longer. The effect on firm survival seems to be driven both by an increase in aggregate demand and relaxation of financial constraints associated with the lottery windfall gains.

7 Self-Employment

In this section, we focus on the effect of the lottery on self-employment. Individuals might start a business after the lottery prize is awarded because they receive the income shock themselves (or any individual in their network) or the income shock generates new investment opportunities. We estimate the regression in equation (1) where the dependent variable is the growth rate of the number of self-employed individuals between year t and year $t-1$. Table 14 presents the results. We find a positive and significant effect of the income shock on self-employment in winning provinces relative to non-winning provinces. Results are robust across specifications. In particular, the coefficient of interest in column (3) is 0.87, 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 that the average number of self-employed individuals by province is 41,075, this corresponds to an increase of about 357 self-employed individuals.

We also analyze the effect of the lottery prize according to the characteristics of self-employed individuals. These results inform us about which individuals are more likely to react to an aggregate demand shock by creating a new business. The dependent variable is the growth rate of the number of self-employed individuals by gender, nationality, age, number of employees hired, activity, and sector. Table A12 in the Internet Appendix shows that the effect of the lottery prize is stronger for self-employed workers that 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 that hire other employees and operate in the manufacturing sector.

8 Conclusion

Entrepreneurship is a key driver of economic growth and job creation. In this paper, we exploit a randomized (unearned) income shock – the Spanish Christmas lottery – to identify the causal effect of disposable income on entrepreneurship. We focus on windfall gains as opposed to inheritances or house prices (which affect the value of real estate collateral) as a shock to income and liquidity.

We show that winning provinces experience a positive differential effect on firm creation relative to non-winning provinces. We find that firm creation is more pronounced in small businesses and self-employment and is driven by firm entry, rather than a reduction in firm exit. Firms created following the income shock are of better quality. Conditional on entry, firms created in winning provinces are larger, generate more value-added, and are more likely to survive longer.

The driver of firm creation due to the income shock is not only investment opportunities and aggregate demand. Indeed, we find evidence of a differential effect on firm creation in the tradable sector, which is less dependent on local demand. In addition, we find that the lottery prize effect is stronger for firms with low start-up capital and in provinces with lower economic, financial, and social development. Our results suggest that the increase in entrepreneurial activity in response to income shocks is driven by both an increase in investment opportunities and a reduction in individual financial constraints.

The results also help to understand how public policy can impact entrepreneurship. Our results suggest that public policies such as tax rebates and reductions in personal income taxes can have an important role in promoting firm creation. Moreover, by analyzing how the impact of the income shock on entrepreneurship differs across provinces with different

characteristics, we can better understand the effect that public policies would have in regions with different levels of development. Our findings suggest that less developed regions would benefit the most from public policies intended to promote entrepreneurship.

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Table 1: Summary Statistics of 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 Spanish Christmas Lottery variables. Panel B shows the Christmas 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	25%	Median	75%	Obs.
Panel A: Lottery Variables in All Provinces						
Expenditure pc (euros)	56.82	27.92	40.01	52.65	67.74	1200
Expenditure/GDP (%)	0.29	0.11	0.22	0.28	0.35	1200
Prize pc (euros)	21.28	186.33	0.00	0.00	0.68	1200
Prize/GDP (%)	0.10	0.83	0.00	0.00	0.00	1200
Winning Tickets	91.30	346.89	0.00	0.00	10.00	1200
Winning Tickets pc	0.03	0.19	0.00	0.00	0.00	1200
Panel B: Lottery Variables in Provinces with Maximum Prize per capita						
Expenditure pc (euros)	76.49	41.39	46.72	63.17	94.58	24
Expenditure/GDP (%)	0.34	0.15	0.23	0.32	0.40	24
Prize pc (euros)	747.82	1093.59	183.77	361.68	644.96	24
Prize/GDP (%)	3.43	4.79	0.88	1.52	3.60	24
Winning Tickets	1489.54	835.21	1060.00	1375.00	1830.50	24
Winning Tickets pc	0.70	0.87	0.16	0.24	0.88	24
Panel C: Macroeconomic Variables						
GDP pc (euros thousand)	19.58	4.86	15.99	18.85	22.68	1200
Disposable Income pc (euros thousand)	13.46	2.68	11.55	12.98	15.31	850
Housing Price (euros per square meter)	1205.37	579.80	751.95	1095.34	1528.41	1200
Inflation Rate (%)	2.80	1.69	1.89	3.00	3.82	1200
Unemployment Rate (%)	16.90	8.12	10.35	15.77	21.97	1200
Population (thousand)	861.59	1046.42	349.77	564.20	973.29	1200
Loans pc (euros thousand)	18.32	9.98	10.04	16.23	24.93	1176
Loans per Branch (euros thousand)	19.98	12.72	9.81	16.99	28.09	1200

Table 2: Summary Statistics for Outcome Variables

This table reports mean, standard deviation and mean differences of winning provinces (24 observations) and non-winning provinces (1176 observations) for our outcome variables. The sample covers the period 1992-2015. *, **, and *** indicate statistical significance at the 10%, 5% or 1% level, respectively.

	Non-Winning	Winning	Difference
Total Firms	15908.333	30486.217	-14577.885
	(26020.77)	(54444.40)	(11890.14)
New Firms	1043.640	1740.826	-697.186
	(1682.08)	(2591.60)	(458.52)
Net Entry Rate (%)	5.889	6.466	-0.576
	(8.44)	(8.87)	(1.78)
Entry Rate (%)	8.584	8.999	-0.415
	(5.11)	(5.64)	(1.18)
Exit Rate (%)	2.694	2.533	0.161
	(4.49)	(4.53)	(0.84)
Total Self-Employed	40350.925	76548.917	-36197.991
	(41494.19)	(96051.17)	(30180.75)

Table 3: Summary Statistics of New Firms

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

	Mean	Standard Deviation	25%	Median	75%	Observations
Assets (euros)	499462	2174231	19001	64308	205001	392682
Employees	7.12	215.70	2.00	3.00	5.00	184252
Sales (euros)	229646	703793	24587	70367	184502	168478
Value-Added (euros)	132285	400439	11836	34883	100058	237234
Wages (euros)	50630	125744	7237	19250	47049	249284
Leverage	0.52	0.68	0.00	0.48	0.75	71062
Z-score	2.54	9.47	1.00	1.55	3.05	173824

Table 4: The Effect of Macroeconomic Variables on Lottery Prizes

This table presents estimates of regressions of *Lottery Prize Dummy*$_t$ on several macroeconomic variables. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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	1150	1150	1150	1150
Adjusted R^2	0.008	0.017	0.010	0.019

Table 5: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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	1150	1150	1150	1150	1104
Adjusted R^2	0.894	0.903	0.918	0.920	0.922

Table 6: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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	1150	1150	1150	1150	1104
Adjusted R^2	0.956	0.959	0.962	0.963	0.965

Table 7: The 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 methods. Disposable income is instrumented with the lottery prize per capita. *Lottery Prize* pc_{t-1} is the lottery prize per capita in each province (in euros thousand) in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *Disposable Income* pc_t is the disposable income per capita in each province (in euros thousand) in year t. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. $Housing\ Price_{t-1}$ is the logarithm of the housing price in year $t-1$. $Population_{t-1}$ is the logarithm of the population in year $t-1$. $Inflation\ Rate_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. $Unemployment\ Rate_{t-1}$ is the unemployment rate in year $t-1$. Column (1) shows the results of the regression of the entry rate between year $t-1$ and year t at the province level on disposable income per capita. Column (2) shows the first stage results of the regression of disposable income per capita on *Lottery Prize* pc_{t-1}. Column (3) shows the second-stage results of a regression of the entry rate between year $t-1$ and year t at the province level on the instrumented disposable income. 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.

	OLS	IV	
		First Stage	Second Stage
	(1)	(2)	(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}	3.647	-0.970	3.334
	(0.79)	(-0.43)	(0.69)
GDP pc_{t-1}	-4.255*	6.638***	-3.127
	(-1.72)	(6.86)	(-1.31)
Housing $Price_{t-1}$	-2.202**	-0.295	-2.254**
	(-2.09)	(-0.58)	(-2.10)
$Population_{t-1}$	-1.499	-1.524	-1.828
	(-0.53)	(-1.41)	(-0.62)
Inflation $Rate_{t-1}$	0.425***	-0.040	0.418***
	(2.75)	(-0.69)	(2.64)
Unemployment $Rate_{t-1}$	-0.046*	-0.000	-0.045*
	(-1.77)	(-0.01)	(-1.72)
Time fixed effects	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes
Observations	850	850	850
Adjusted R^2	0.905	0.914	0.905
F-Statistic		399.17	

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

This table presents estimates of regressions of the entry rate between year $t-1$ and year t at the province level. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. Column (1) shows the results when we exclude firms in the construction sector. Column (2) excludes firms in both the construction and non-tradable sectors and column (3) also excludes financial firms. Column (4) includes firms in the non-tradable sector and column (5) includes firms in the tradable sector. Industries are classified as tradable or non-tradable following the Mian and Sufi (2014) classification. Column (6) includes manufacturing firms. 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 Construction (1)	Excluding Construction & Non-Tradable (2)	Excluding Construction Non-Tradable & Financial (3)	Non-Tradable (4)	Tradable (5)	Manufacturing (6)
Lottery Prize Dummy$_{t-1}$	0.696**	0.698**	0.656*	0.687*	0.681*	0.652**
	(2.27)	(2.05)	(1.96)	(1.95)	(1.78)	(2.33)
Lottery Expenditure pc$_{t-1}$	-4.819	-4.825	-4.698	-6.508	2.479	6.304
	(-0.70)	(-0.70)	(-0.68)	(-0.92)	(0.34)	(0.81)
GDP pc$_{t-1}$	-1.270	-1.916	-2.071	1.671	-1.121	0.384
	(-0.46)	(-0.72)	(-0.81)	(0.46)	(-0.37)	(0.13)
Housing Price$_{t-1}$	-0.779	-0.670	-0.638	-1.462*	-1.423**	-1.646**
	(-1.34)	(-1.20)	(-1.15)	(-1.78)	(-2.19)	(-2.22)
Population$_{t-1}$	-0.794	-1.015	-1.046	0.166	-0.104	2.100
	(-0.28)	(-0.37)	(-0.39)	(0.05)	(-0.03)	(0.61)
Inflation Rate$_{t-1}$	0.048	0.062	0.054	0.022	-0.087	-0.146
	(0.29)	(0.38)	(0.34)	(0.09)	(-0.49)	(-0.76)
Unemployment Rate$_{t-1}$	-0.052**	-0.054**	-0.054**	-0.043	-0.035	-0.037
	(-2.03)	(-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	1150	1150	1150	1150	1150	1150
Adjusted R^2	0.923	0.913	0.913	0.887	0.869	0.861

Table 9: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. In each column, the low and high groups consist of those provinces that are below and above the median of the distribution of number of banks loans per capita, average debt held by small and young firms, 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 Loan		Small and Young Firms 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 10: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure pc*$_{t-1}$ is lottery expenditure per capita in year $t-1$. In each column, 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 11: The Effect of Lottery Prizes on Firm Creation: Social 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. In each column, the low and high groups consist of those provinces that are below and above the median of the distribution of the fraction of illiterate people, number of violent death per capita, population and firm density and hotel capacity 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.

	Education		Delinquency		Population Density		Tourism	
	Low	High	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lottery Prize Dummy$_{t-1}$	0.664	0.701**	0.331	0.936***	0.797**	0.043	0.845*	0.517**
	(0.89)	(2.73)	(0.64)	(2.80)	(2.58)	(0.15)	(1.83)	(2.10)
Lottery Expenditure pc$_{t-1}$	-42.375**	1.251	-21.882	0.148	6.279	-62.293	-78.506*	7.882*
	(-2.11)	(0.23)	(-0.90)	(0.03)	(1.31)	(-1.68)	(-1.75)	(1.84)
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	0.947	0.904	0.932	0.916	0.931	0.947	0.907	0.949

Table 12: The 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, logarithm of employees, logarithm of sales, logarithm of value-added, 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*$_{t-1}$ is a dummy variable that takes a value of one for new firms incorporated in provinces that receive the maximum prize per capita in year $t-1$ (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 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	392434	319760	239806	167055
			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	184246	144653	107705	70100
			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	168471	145044	112501	75442
			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	130224	110419	86078	57532
			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	249075	202570	152426	100338
			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	71059	57344	44949	32420
			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	173817	149972	116597	79096

Table 13: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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.

	Survives ≥ 1	Survives ≥ 2	Survives ≥ 3	Survives ≥ 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	274392	274392	274392	274392
Adjusted R^2	0.975	0.926	0.857	0.713

Table 14: The Effect of Lottery Prizes on Self-Employment

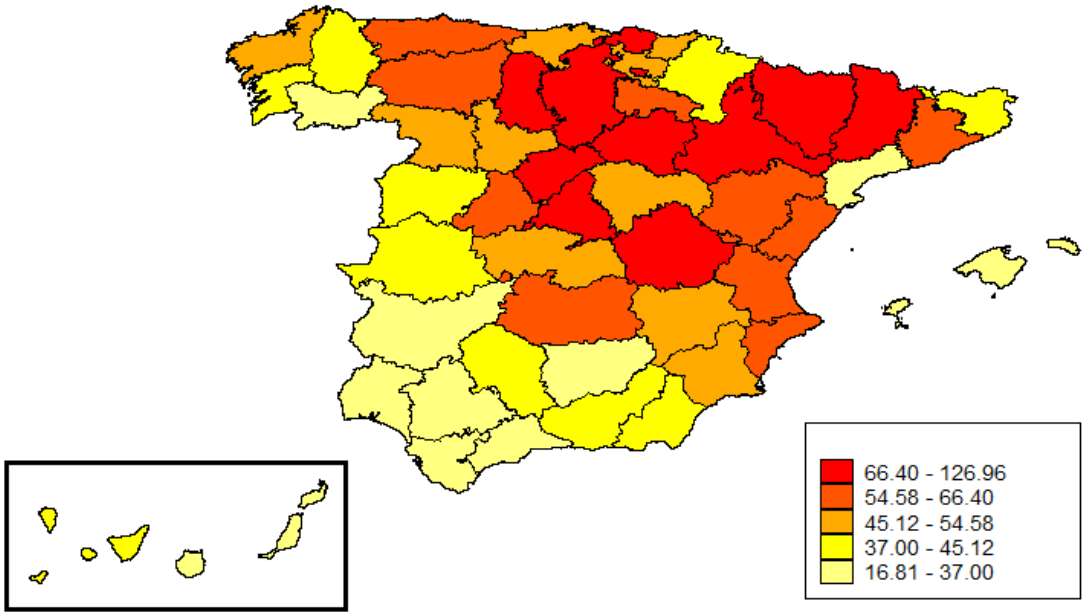
This table presents estimates of regressions of the growth rate of the number of self-employed individuals between year $t-1$ and year t (net entry rate) at the province level. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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 Expenditures and Prizes by Province

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

Panel A: Expenditures per capita (euros)



Panel B: Prizes per capita (euros)

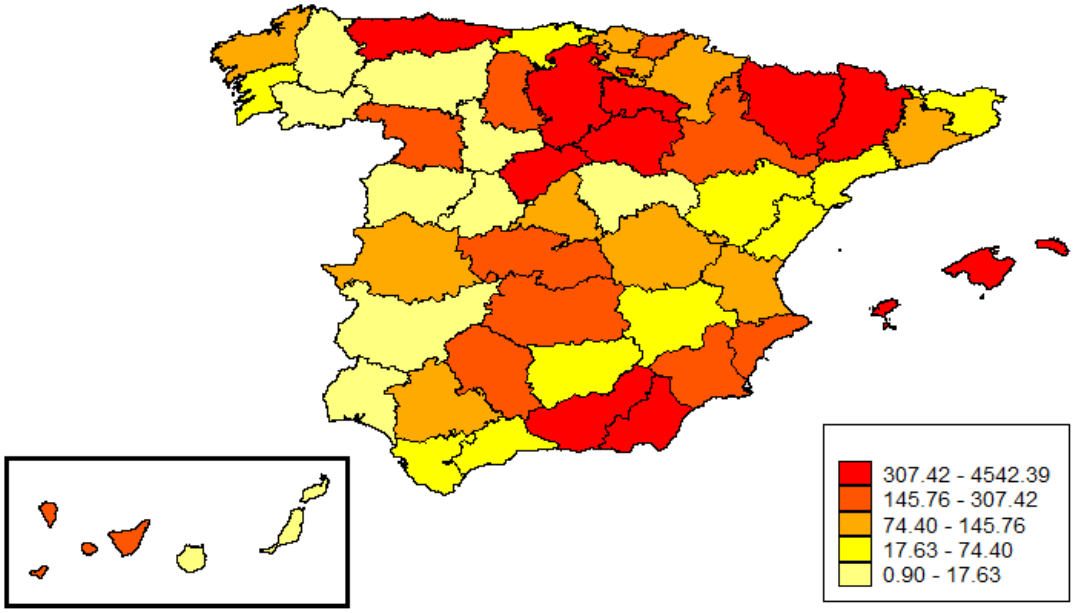
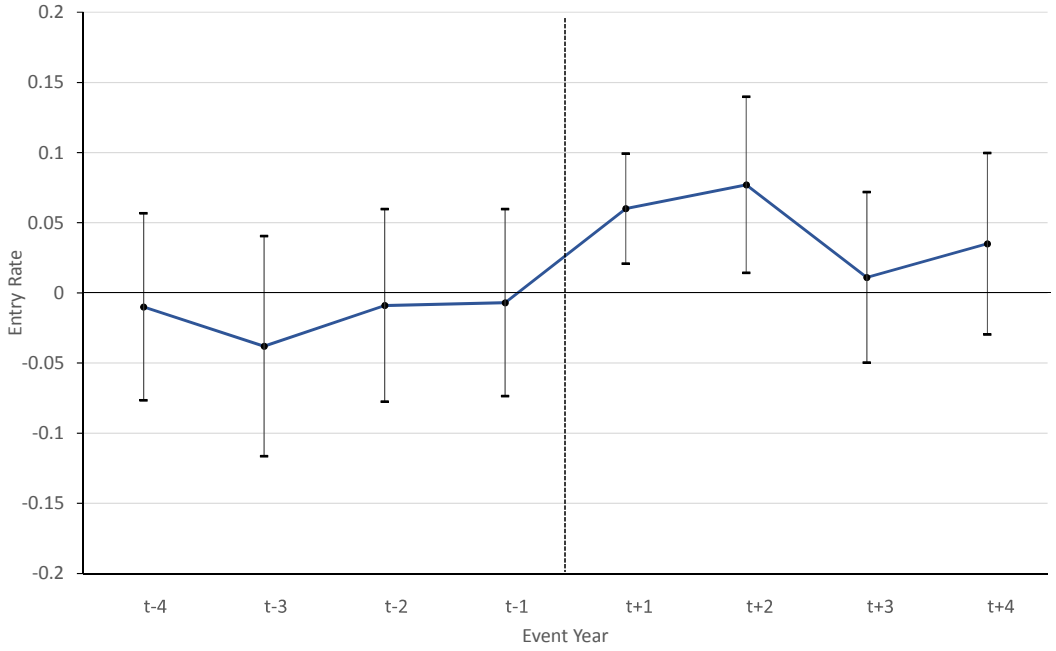


Figure 2: The Effect of Lottery Prizes on Firm Creation

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. The main explanatory variable is *Lottery Prize Dummy*$_{t-1}$ defined as a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. The regression includes four leads and lags of the *Lottery Prize Dummy*$_{t-1}$ variable. 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

This Internet Appendix reports the results of robustness tests:

- Table A1: Summary Statistics of Self-Employment
- Table A2: The Effect of Lottery Prizes on Firm Creation: Full population
- Table A3: The Effect of Lottery Prizes on Firm Entry and Exit
- Table A4: The Effect of Lottery Prizes on Firm Entry Scaled by Population
- Table A5: The Effect of Lottery Prizes on Firm Entry: Alternative Explanatory Variables
- Table A6: Alternative Instrumental Variables Analysis: The Effect of Lottery Prizes on Aggregated Firm Outcomes
- Table A7: The Effect of Lottery Prizes on Firm Creation by Legal Status
- Table A8: The Effect of Lottery Prizes on Firm Creation: Capital Requirements
- Table A9: The Effect of Lottery Prizes on the Local Economy
- Table A10: The Effect of Lottery Prizes on the Local Economy: Openness Ratio
- Table A11: The Effect of Lottery Prizes on Firm Outcomes: Excluding Firms in the Construction and Non-Tradable Sectors
- Table A12: Lottery Prizes and Self-Employed Individuals Characteristics

Table A1: Summary Statistics of Self-Employment

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

	Mean	Standard Deviation	25%	Median	75%	Obs.
Total	41075	43387	18592	30158	44643	600
Male	27697	29707	12923	20369	29227	600
Female	13377	13928	5766	10065	14532	600
Age < 25	861	922	319	617	988	600
Age 25-39	12162	13782	4903	8603	13316	600
Age 40-54	18130	18617	8176	13633	19914	600
Age >54	9922	10335	4963	7509	11104	600
National	38366	39343	17967	29025	40599	600
Foreigner	2709	4635	479	956	2448	600
Employees=0	32974	35267	15327	24729	35479	600
Employees=1	8101	8298	3291	5439	9994	600
Pluriactivity=0	39184	41047	17664	28707	42841	600
Pluriactivity=1	1890	2409	824	1276	1963	600
Agriculture	5669	3838	3126	4803	6649	600
Manufacturing	2183	2609	936	1463	2461	600
Construction	5105	5870	2236	3358	5827	600
Service	28119	35401	10568	18756	31202	600

Table A2: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. The sample includes the full population of firms provided by the Spanish National Statistics Institute 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	1050	1050	1050	1050	1008
Adjusted R^2	0.800	0.839	0.912	0.916	0.915

Table A3: The 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 number of firms exiting in year t at the province level. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure pc*$_{t-1}$ is lottery expenditure per capita in year $t-1$. *GDP pc*$_{t-1}$ is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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.

	Firm Entry (log)			Firm Exit (log)		
	(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	1150	1150	1104	1150	1150	1104
Adjusted R^2	0.978	0.979	0.976	0.975	0.975	0.975

Table A4: The 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 scaled by population in $t-1$ at the province level. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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	1150	1150	1150	1150	1104
Adjusted R^2	0.505	0.678	0.841	0.882	0.877

Table A5: The 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_{t-1} is the lottery prize per capita in each province (in euros thousand) in year $t-1$. *Lottery Prize/GDP*$_{t-1}$ is the lottery prize scaled by GDP in each province (in percentage) in year $t-1$. *Winning Tickets* pc_{t-1} is the number of winning tickets per capita in each province in year $t-1$. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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)
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)
Inflation Rate$_{t-1}$	0.077	0.077	0.075
	(0.46)	(0.46)	(0.45)
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	1150	1150	1150
Adjusted R^2	0.920	0.920	0.920

Table A6: Alternative Instrumental Variables Analysis: The Effect of Lottery Prizes on Provincial Firm Outcomes

This table presents estimates of the effect of disposable income on aggregated new firms' outcomes using instrumental variables methods. Disposable income is instrumented with the lottery prize per capita. *Lottery Prize* pc_{t-1} is the lottery prize per capita in each province (in euros thousand) in year $t-1$. *Disposable Income* pc_t is the disposable income per capita in each province (in euros thousand) in year t. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. $Housing\ Price_{t-1}$ is the logarithm of the housing price in year $t-1$. $Population_{t-1}$ is the logarithm of the population in year $t-1$. $Inflation\ Rate_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. $Unemployment\ Rate_{t-1}$ is the unemployment rate in year $t-1$. The dependent variable in column (1) is the total amount of assets of all the new firms created per province in year t divided by population per province in year t. The dependent variable in column (2) is the total amount of sales of all the new firms created per province in year t divided by population per province in year t. The dependent variable in column (3) is the total amount of equity of all the new firms created per province in year t divided by population per province in year t. Each column shows the results of a regression of the aggregated outcome of new firms in year t (per capita) at the province level on the instrumented disposable income. 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
Fitted 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 A7: The 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*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure* pc_{t-1} is lottery expenditure per capita in year $t-1$. *GDP* pc_{t-1} is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. 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	1150	1150
Adjusted R^2	0.932	0.751

Table A8: The Effect of Lottery Prizes on Firm Creation: Capital Requirements

This table presents estimates of regressions of the entry rate and net entry rate between year $t-1$ and year t. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure pc*$_{t-1}$ is lottery expenditure per capita in year $t-1$. *GDP pc*$_{t-1}$ is the logarithm of GDP per capita in year $t-1$. *Housing Price*$_{t-1}$ is the logarithm of the housing price in year $t-1$. *Population*$_{t-1}$ is the logarithm of the population in year $t-1$. *Inflation Rate*$_{t-1}$ is the growth of the CPI between year $t-1$ and year $t-2$. *Unemployment Rate*$_{t-1}$ is the unemployment rate in year $t-1$. The low and high groups consist of those provinces that are below and above the median of the distribution of initial capital requirements. The initial capital requirements are the average initial capital of all newly created firm 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			High Initial Capital		
	(1)	(2)	(3)	(4)	(5)	(6)
Lottery Prize Dummy$_{t-1}$	0.544***	0.625***		0.225**	0.174*	
	(2.93)	(3.68)		(2.32)	(1.69)	
Lottery Prize pc$_{t-1}$			0.286***			-0.033
			(3.75)			(-0.62)
Lottery Expenditure pc$_{t-1}$	-1.930	3.034	3.050	-1.621	-3.842	-3.913
	(-0.81)	(0.70)	(0.68)	(-0.94)	(-1.43)	(-1.41)
GDP pc$_{t-1}$	-2.307***	0.899	0.971	0.489	-0.369	-0.346
	(-4.05)	(0.52)	(0.55)	(1.06)	(-0.35)	(-0.33)
Housing Price$_{t-1}$	-0.061	-0.210	-0.248	-0.415	-0.705**	-0.717**
	(-0.19)	(-0.52)	(-0.60)	(-1.48)	(-2.52)	(-2.57)
Population$_{t-1}$	0.206**	2.830	2.878	-0.008	-2.944***	-2.951***
	(2.17)	(1.45)	(1.46)	(-0.10)	(-3.05)	(-3.05)
Inflation Rate$_{t-1}$	-0.061	-0.041	-0.032	0.074	0.090	0.094
	(-0.49)	(-0.36)	(-0.28)	(0.92)	(1.10)	(1.15)
Unemployment Rate$_{t-1}$	-0.024*	-0.042**	-0.042**	0.016	-0.024**	-0.024**
	(-1.90)	(-2.23)	(-2.23)	(1.55)	(-2.38)	(-2.32)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed effects	No	Yes	Yes	No	Yes	Yes
Observations	1150	1150	1150	1150	1150	1150
Adjusted R^2	0.898	0.916	0.915	0.825	0.884	0.884

Table A9: The Effect of Lottery Prizes on the Local Economy

This table presents estimates of regressions of GDP per capita growth, housing prices growth, inflation rate, unemployment rate growth, and population growth in year t, year $t+1$, year $t+2$, and year $t+3$ relative to year $t-1$. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure pc*$_{t-1}$ is lottery expenditure per capita in year $t-1$. All regressions include time fixed effects and population weights. 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.

			Δ GDP pc	
	Year t	Year $t+1$	Year $t+2$	Year $t+3$
Lottery Prize$_{t-1}$	-0.101	-0.028	0.362	0.011
	(-0.98)	(-0.34)	(1.53)	(0.03)
Lottery Expenditure pc$_{t-1}$	2.477**	2.385**	4.470**	6.944**
	(2.15)	(2.09)	(2.04)	(2.05)
Observations	1150	1150	1100	1050
Adjusted R^2	0.681	0.680	0.750	0.780
			Δ Housing Prices	
	Year t	Year $t+1$	Year $t+2$	Year $t+3$
Lottery Prize$_{t-1}$	0.787	-0.560	-1.794	-3.716
	(0.92)	(-0.39)	(-1.05)	(-1.46)
Lottery Expenditure pc$_{t-1}$	0.174	-0.947	-4.502	-15.536
	(0.02)	(-0.05)	(-0.15)	(-0.37)
Observations	1150	1100	1050	1000
Adjusted R^2	0.670	0.726	0.749	0.759
			Δ CPI	
	Year t	Year $t+1$	Year $t+2$	Year $t+3$
Lottery Prize$_{t-1}$	0.097***	0.293***	0.357**	0.384
	(3.29)	(3.61)	(2.09)	(1.36)
Lottery Expenditure pc$_{t-1}$	1.938	4.169	6.886*	10.298*
	(1.62)	(1.65)	(1.78)	(1.98)
Observations	1150	1100	1050	1000
Adjusted R^2	0.950	0.951	0.942	0.924
			Δ Unemployment Rate	
	Year t	Year $t+1$	Year $t+2$	Year $t+3$
Lottery Prize$_{t-1}$	-0.168	-0.260	-0.608	-0.227
	(-0.40)	(-1.42)	(-1.49)	(-0.84)
Lottery Expenditure pc$_{t-1}$	0.897	0.933	0.298	-1.701
	(0.77)	(0.79)	(0.13)	(-0.49)
Observations	1150	1150	1100	1050
Adjusted R^2	0.632	0.631	0.771	0.813
			Δ Population	
	Year t	Year $t+1$	Year $t+2$	Year $t+3$
Lottery Prize$_{t-1}$	0.164	0.427*	0.672*	0.932**
	(1.30)	(2.00)	(1.98)	(2.41)
Lottery Expenditure pc$_{t-1}$	-0.647	-1.570	-2.677	-4.265
	(-0.17)	(-0.20)	(-0.22)	(-0.25)
Observations	1150	1100	1050	1000
Adjusted R^2	0.550	0.525	0.495	0.459

Table A10: The Effect of Lottery Prizes on the Local Economy: Openness Ratio

This table presents estimates of regressions of GDP per capita growth and unemployment rate growth in year t, year $t+1$, year $t+2$, and year $t+3$ relative to year $t-1$. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, and zero otherwise. *Lottery Expenditure pc*$_{t-1}$ is lottery expenditure per capita in year $t-1$. The low group consists of those provinces that are in the bottom tercile of the openness ratio. The high group consists of those provinces that are in the top tercile of the openness ratio. All regressions include time fixed effects and population weights. 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.

Panel A: Δ GDP pc

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

Panel B: Δ Unemployment Rate

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

Table A11: The Effect of Lottery Prizes on Firm Outcomes: Excluding Firms in the Construction and Non-Tradable Sectors

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, logarithm of employees, logarithm of sales, logarithm of value-added, 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*$_{t-1}$ is a dummy variable that takes a value of one for new firms incorporated in provinces that receive the maximum prize per capita in year $t-1$ (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 exclude firms in the construction and non-tradable sectors during 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	210673	170978	128661	88236
			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	99380	77654	57932	38036
			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	97008	83736	64524	42958
			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	71896	60817	47239	31603
			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	136450	110717	83432	55266
			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	37287	29990	23368	16165
			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	99041	85576	66101	44317

Table A12: Lottery Prizes and Self-Employed Individuals Characteristics

This table presents estimates of regressions of the net entry rate of self-employed individuals between year $t-1$ and year t by gender, nationality, age, activity, and sector at the province level. *Lottery Prize Dummy*$_{t-1}$ is a dummy variable that takes a value of one if a given province receives the maximum prize per capita in year $t-1$, 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		Activity		Sector			
	Employees=0	Employees=1	Pluriactivity=0	Pluriactivity=1	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