Does Tax Evasion affect firms’ birth rate?

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Abstract

The study of the factors that affect new firm birth is a topic of interest to many parties, either scholars and policy makers.

Literature has investigated regional variation in firms birth rate focusing on demographic factors (population growth), entrepreneurial environment characteristics (industrial specialization, industrial intensity, R&D), financial and economic development of the area (credit market, income growth rate, unemployment), socio-economic characteristics (immigration, social capital, human capital) physical and social infrastructure (regional diversity and creativity). In this study we investigate whether the propensity to evade in a territory can affect new firms formation. As a matter of fact, tax evasion can influence the capability of a firm to raise money to set up a firm but it can also provide additional resources to extend the survival over time, especially when faced with adverse macroeconomic shocks.

Keywords: new firm birth, tax evasion, entry rate

JEL classification codes: C33; H26; K42; M13
1. Introduction

The study of the factors that affect new firm birth is a topic of interest to many parties, either scholars and policy makers. Economic development cannot proceed without a lively entrepreneurial sector, and the role of entrepreneurship as a driver of economic progress has been investigated since the seminal analysis of Schumpeter (1911).

It is well known that a well working financial system is a necessary ingredient for economic growth, since it allows to rise either the quality and the quantity of investment. In a different perspective, there is a large strand of literature (REF) showing how the financial markets conditions affect the real variables during the business cycle, through the credit channel and/or the balance sheet effects.

In this paper we aim to investigate the role of tax evasion among the factors that affect the decision to set up a new business, in order to explain the variation of new firms' birth rate across Italian provinces.

Literature (REF) has dealt with regional variation in firms’ birth rate focusing on demographic factors (population growth), entrepreneurial environment characteristics (industrial specialization, industrial intensity, R&D), financial and economic development of the area (credit market, income growth rate, unemployment), socio-economic characteristics (immigration, social capital, human capital) physical and social infrastructure (regional diversity and creativity). The issue regarding which we aim at deepening the existing knowledge concerns the effects of tax evasion on new business creation, in the presence of credit restrictions. This relationship is justified for the European countries of the Mediterranean area and for many transition economies because they are characterized by a considerable underground production, an industrial structure almost completely unbalanced on the small firm size and high barriers to access to credit in a purely bank-centered financial system. The typical features of small businesses (diminutive size, little commitment of shareholder capital, lack of transparency) make it nearly impracticable for them to access to bond and equity markets directly. For that matter, a large part of their debt is bank debt and thus they are most severely affected by the tightening credit supply, and they may be pushed to alternative and not legal channel providing funding, namely the illegal credit market (usury market) and/or tax evasion.

According to the ECB Survey on small and medium-sized enterprises (SME) access to finance (a demand-side survey, see ECB, 2013) and the OECD Scoreboard (a supply-side survey, see OECD, 2013), following the aftermath of 2007 financial crisis, conditions to access to finance remained tight for SMEs in the Euro area economies. Since 2009, the first year of the ECB SME survey, Euro area SMEs reported a continuous decline in profits, to which SMEs in Italy and Spain contributed strongly. In these latter countries a very large percentage of firms (50%) reported, still in 2013, that access to finance is a very pressing problem, with a peak recorded in Greece (61%), whereas the corresponding
percentage shrinks to 30% in Germany and Belgium. This suggest that credit market conditions are very different across countries, with financial strains in vulnerable Euro countries (“PIGS”).

The other-way interaction going from underground economy/tax evasion to credit market is well documented as well. Recent analysis of Italian financial markets (Cannari and Gobbi, 2010) suggests that the considerable incidence of the underground economy is among the causes that explain the gap in financial development in southern compared to northern regions. Other studies have demonstrated that the presence of illegal activities in the southern regions significantly increases the interest rates (Bonaccorsi di Patti, 2009), while underground economy (namely irregular work) has a significant and negative effect of the credit to GDP ratio (Gobbi and Zizza, 2007).

Generally speaking, tax evasion, has a contrasting effect on the ability of a territory to generate new firms. On the one hand, tax compliant firms in a territory where tax evasion is widespread afford unfair competition, in this sense "honest" entrepreneurs should be discouraged from setting up new business. On the other hand, since tax evasion can be shaped as a source of self-financing to firms, "less honest" entrepreneurs might have an higher incentive to start their business in areas characterized by high tax-evasion. As we will see, our results suggest that this latter effect prevails.

2. Literature review and motivation

This paper aims at bridging two main branches of literature. The former focuses on regional variation in new firm formation (see the special issue of Regional Studies, 1994), with a special attention to the role of the financial markets. The latter deals with the nexus between financial markets and underground activities. Given that credit is a crucial variable allowing the birth of a new firm, the "bridge" is in the role of underground credit, namely in the form of tax evasion.

With regard to the determinants of regional variation in new firm formation, cross countries studies (Klapper et al. 2010) envisage in quality of the regulatory and legal environment, access to finance, and business environment the key explanatory variables for firm birth rate. Similarly, studies investigating new firm formation within a single country (Bartik, 1989, Armington and Acs, 2002; Lee et al. 2004; Rocha and Sternberg, 2005) find as significant explanatory variables tax variables, industrial density, population and income growth, selected public services (fire protection, welfare), financial market variables, human capital, social infrastructures such as creativity and diversity, measures of geographical proximity.

With regard to the literature investigating the nexus between informal economy/tax evasion and financial markets, the cost of accessing credit is ultimately the opportunity cost of operating formally
This also explains why smaller firms which are by their nature characterized by a higher degree of informational opacity face higher cost of access to credit (Berger Udell, 1998) and, in turn, why a larger share of firms that go underground are small/medium size firms. Since access to credit is vital not only for firms’ investment and growth (firms' growth), but at first for firms' birth, informational frictions, the choice to be underground and the new business creation are all strictly interconnected. Although taxation is seen as one of the most important determinants in affecting the decision to start a new firm, none of the studies has so far investigated the role of tax evasion on entrepreneurship. This is an a relevant issue since beyond the commonly envisaged implication that tax evasion engenerates unfair competitiveness, a more subtle analysis reveals that it can also operate as an additional source of funding, especially valuable in presence of credit constraints. In addition, if we consider that most of tax evasion is originated by moonlighting firm, by which we mean a firm that operates simultaneously in the official and unofficial sectors, we get that in territories characterized by flourishing and successful tax evasion, the effective tax burden suffered by moonlighter entrepreneurs (tax evaders) is less burdensome compared to territories where tax enforcement is stricter. This might push more firms to enter the market in areas with lower enforcement, since in presence of lower expected taxes, also less efficient firms enter the market.

We are aware the resorting to illegal channel for providing funding to an entrepreneurial activity has very different effects in the short and in the long run. In other words, this decision could turn out to be short sighted. However, the present article builds on this line of thinking since in presence of credit rationing, many small and medium sized firm might be compelled to adopt such approach.

3. The data set
The panel dataset contains annual observations from 101 Italian provinces over the period 2001 to 2013.

The dependent variable concerning the new firm birth and the exit rates are taken from the Italian National Statistical Institute. Precisely, the birth rate (hereinafter referred to also as entry rate) is measured by standardizing the number of new entrants relative to the number of firms already in existence (ecological approach); similarly, the exit rate is given by the number of firms ceasing their activity relative to the number of firms already in existence. Both the ratios are available for the period 1996-2014.

With regard to tax evasion, the source of data is the Revenue Agency. Precisely, we consider the propensity to evade given by the ratio between tax gap and tax compliance, and it is available for the
period 2001-2013. This latter is measured by the spontaneous fiscal revenues in each province, and the time series individually taken is only available for the period 2001-2010.

The remaining explanatory variables are derived by socioeconomic, socio-demographic and deterrence factors.

The socioeconomic variables include the value added per capita (level and rate of growth), the share of the value added produced in the financial sector, the activity rate (both total and the female activity rate), the unemployment rate, a metric to measure social capital (ISTAT), and a composite indicator built to measure institutional quality in Italy (Institutional Quality Index-IQI, Nifo and Vecchione, 2014).

The importance of the availability of credit is "captured" using a metric to measure banks’ non-performing loans. Specifically, we use the ratio of non-performing loans to performing loans (source, Bank of Italy). An additional financial variable included in the estimated models to test wealth effects represents per capita bank deposits in each province. Finally, we include in the estimated models a standard measure of market concentration in the loan market, the Herfindahl index for loans (Bank of Italy).1

We also include education in the analysis, and we define it as the number of men 24-34 years old who have achieved at most a middle school diploma for every 100 men in that same age group. In addition, we control for the innovative profile of the local productive structure by measuring the proportion of patents and the propensity to export.

4. Exploratory analysis

The dependent variables, the entry and exit rates, vary considerably over time, as it is clear from Figure 1. On average, entry rates are always higher that the outflow rates. However, the business cycle plays an important role in shaping the net inflow of new firms in the market. During economic downturns, the average entry rate declines whereas the exit rate increases or declines less than the inflow: the distance between the blue and the red bars, in Figure 1, shrinks. This is the case for the recession of 2002-2003, for instance, when the entry rate declined and the exit rate showed a mild

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1 We thank Riccardo De Bonis (Bank of Italy), who kindly provided the Herfindahl index data. On some aspects emphasized by the concentration indicator in the market for Italian loans, see De Bonis and Ferrando (2000) and Infante and Rossi (2009), among others.
increase. It is more evident for the recession subsequent to the financial crisis started in 2007: in 2007-2009 the average exit rate raised almost by one percentage point (from 6.3 in 2006 to 7.3 in 2007-2008 and 6.7 in 2009) and the entry rate declined by the same amount (from 7.8 in 2007 to 6.8% in 2009).

Figure 1

The business cycle effect on the new firm birth rate is an easy to understand mechanism. In addition to this the time variability there is ample heterogeneity across Italian provinces, as it is witnessed by the ample gap between the minimum and maximum values recorded for each year of the sample, either in terms of entry rate and for the exit rate.
Differences across territories are worth to be better investigated, to clarify which are the areas where firms’ dynamics are more pronounced. If we compare a province with high per capita income, Milan, and another one with low per capita income, Naples, we find quite surprisingly that the net rate of new business creation is significantly higher in the poorer provinces. We would expect exactly an opposite evidence, since it is usually claimed that the variation of firm birth rates is related to existence of: regional externalities, also originating from a high concentration of firms and benefiting from high personal income growth; infrastructures of services; higher average level of education; entrepreneurial culture (Armington and Acs, 2002). Different explanations might be at the origin of this evidence. First of all a process of catching up, suggesting that in less developed areas there is a more pronounced dynamism in entrepreneurial activity. Second, a different structure of the economic environment, more or less specialised in sectors with high firm turnover. Finally, an explanation could be related to an “illegal” environment favouring a false dynamism, for instance a lower effective tax burden. Actually, Milan and Naples are very different not only for the above listed variables, that favour Milan, but also in terms of propensity to tax evasion, that is considerably higher in Naples.
Interestingly, most of the difference in the net rate of new firm creation is due to an almost double entry rate recorded in the Naples province compared to Milan, whereas in terms of exit rates the two areas are more similar (see Figure 3). Hence, the challenge is to understand whether and to which extent tax evasion might favour the entry rate of new firms.

Starting from this very intuitive and preliminary evidence, we proceed to check for evidence of correlation among our dependent variable, the new firm birth rate, and the explanatory variable which we focus on. The scatter plot reported in Figure 4 and Figure 5 suggest that our intuition might be worth to be further investigated.

As it is clear, there is evidence of significant and positive correlation between new firm formation and tax evasion. In other terms, in provinces where the share of tax receipts concealed to tax
authorities is large we also observe that the entry rate is relatively higher; conversely, in those territories the exit rate is observed to be smaller.

Figure 4: Scatter plot entry rate (vertical axis) and propensity to evade in the Italian provinces
This is consistent with the statistically significant correlation found, in Italian provinces, between the time-averaged birth rate of new firms and the (time-averaged) tax evasion and usury, amounting to, respectively, 0.12 and 0.09. Similarly positive and significant are the geographically-averaged correlations between the listed variables.

5. Empirical framework

The following models study the impact of tax evasion on new firm entry and exit rates in a panel dataset of Italian provinces for 8 years (2004-2012):

\[
Entry_{it} = \beta_1 TaxEvasion + \beta_2 X_{it} + \eta_i + c_t + u_{it} \quad t = 1, \ldots, T \quad (1)
\]

\[
Exit_{it} = \alpha_1 TaxEvasion + \alpha_2 X_{it} + \eta_i + c_t + u_{it} \quad t = 1, \ldots, T \quad (2)
\]
Equation (1) and Equation (2) are the basic function of new firm formation estimated by the literature, where $\eta_t$ is a separate time period intercept, $X_{it}$ is a $1 \times K$ vector of explanatory variables defined in the previous section, $c_i$ is the time-constant unobserved fixed effect and $u_{it}$ are idiosyncratic errors. We do not estimate a single equation putting together entry and exit in a net flow of new entrants since evidence provided above has shown that the two phenomena are driven by different socioeconomic mechanisms.

In a first step, we simply estimate a pooled OLS model. However, these estimates involve some statistical problems. Firstly, time invariant territorial characteristics (fixed effects) may be correlated with the explanatory variables. Secondly, since for several variables included in the vector $K$ causality may run in both directions with firm's birth rate, these regressors may be correlated with the error term and endogeneity may arise. These panel data require an instrumental variable procedure, which is the object of our second step of econometric analysis. The instrumental variables estimator allows the use of multiple instruments to control for the endogeneity and the absence of orthogonality between the residuals and the regressors. Furthermore, the use of robust standard errors takes into account the presence of heteroskedastic errors.

6. Empirical results

6.1 The entry rate and tax evasion

Table 2 shows the pooled OLS and IV panel estimations for new firms' birth rate in the Italian provinces. This latter estimator allows us to control for unobserved provincial-specific effects that are potentially correlated with our determinants of new firms' entry in the market.

In the estimation of the new firm formation, reported in column 2 of Table 2, per capita value added and propensity to tax evasion are treated as endogenous.

| Table 2 The determinants of new firm formation in Italian provinces (pooled and IV) |
|-----------------|-----------------|-----------------|
| New firm entry rate ($E_t$) | Pooled          | IV              |
| Per capita VA    | $2.87e^{-7}(9.41e^{-8})^{***}$ | $9.96e^{-7}(2.71e^{-7})^{***}$ |
| Prop Evasion     | 0.058 (0.017)$^{***}$ | 0.039 (0.018)$^{**}$ |
The first column provides the best results for the new firm birth rate when estimating a pooled OLS, the second column reports the estimated coefficients when using a instrumental variable approach within a fixed effect model. Variables instrumented are per capita value added and propensity to evade, whereas the instruments used are the share of value added in financial services, and social capital.

As it is clear from Table 2, the explanatory variable of interest, tax evasion, is statistically significant and positively affect the formation of new enterprises in both estimates. This result is consistent with the descriptive evidence commented above, and it supports the intuition that the provision of funds to firms through illegal channels, tax evasion, is a strategic resource for new entrants in the market production. This is certainly due to the fact that financial markets play a crucial role in allowing successful entrepreneurship. As shown in Table 2, the degree of bank concentration, as measured by

| Social capital | 0.0004(0.0022)** | - |
| Bank concentration (Herfindhal Index) | -0.18(0.004)*** | -0.06(0.016)*** |
| Education | 8.72e^{-6}(0.00003) | 0.0003(0.00008)** |
| Propensity to export | 0.00002(0.00001) | 0.00009(0.00004)** |
| Patents | -0.000011(4.43e^{-6})*** | -0.00008(0.00002)*** |
| Constant | 0.071(0.004)*** | 0.027(0.01)*** |
| Time dummies | YES | NO |
| N. observations | 811 | 811 |
| R^2 | 0.2360 | |

Robust standard errors in parenthesis. ***, ** and * indicate coefficient significant at the 1%, 5% and 10% levels, respectively.

IV (instruments): h, education, export propensity, patents, value added financial sector, social capital
the Herfindhal index, is statistically significant and negatively influences the birth of new enterprises, thus suggesting that in the considered sample there is some risk of credit rationing.

With regard to the remaining explanatory variables, when significant their sign is consistent with the existing literature.

### 6.2 The exit rate and tax evasion

Table 3 shows the pooled OLS and IV panel estimations for firms' cessation rate in the Italian provinces. This latter estimator allows us to control for unobserved provincial-specific effects that are potentially correlated with our determinants of firms' exit from the market.

The exit rate is negatively and significantly affected by tax evasion: the availability of additional resources allows to survive longer in areas with high tax evasion. Interestingly, it is not the level of the value added to be influential on firms’ exit, rather it is the rate of growth of value added to be the most important socio economic determinant of the exit rate. A role is also played by the quality of institutions.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>The determinants of firm cessation in Italian provinces (pooled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm exit rate (Ex)</td>
<td>Pooled</td>
</tr>
<tr>
<td>Rate of growth per capita VA</td>
<td>-0.036(0.11)***</td>
</tr>
<tr>
<td>Prop Evasion</td>
<td>-0.005(0.002)***</td>
</tr>
<tr>
<td>IQI</td>
<td>-0.003(0.002)*</td>
</tr>
<tr>
<td>Constant</td>
<td>0.07 (0.001)***</td>
</tr>
<tr>
<td>Time dummies</td>
<td>NO</td>
</tr>
<tr>
<td>N. observations</td>
<td>900</td>
</tr>
<tr>
<td>R^2</td>
<td>0.1778</td>
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</tbody>
</table>
Conclusions

In this paper, we investigate the impact tax evasion on new firm formation in Italian provinces during the period 2004-2012. Based upon descriptive evidence, our estimation strategy aims to separately examine entry and exit rates.

After controlling for determinants commonly accepted in literature on regional variation of new firms birth rate, we have seen that this latter is influenced by either the working of the legal market of credit and by illegal sources of funding, namely tax evasion. In a country like Italy, characterized by a large share of underground economy and tax evasion, and a very large share of small and micro firms, credit rationing can easily arise. Therefore, tax evasion may well represent an alternative source of financing with respect to bank credit.

These results pose serious problems of policy. The malfunctioning of the circuit of credit, rationing borrowers considered most unreliable is the main phenomenon triggering the problematic evidence here depicted. The presence of a high proportion of businesses that operate wholly or partly in the informal sector, means that credit restrictions are strengthened. In this perspective, the presence of tax evasion is an additional risk for banks that provide loans in the territory, and determines favorable conditions for further credit restrictions. This line of reasoning shows a first causal link running from tax evasion to credit rationing, however, the opposite causal channel may well be working. Actually, credit rationing is itself an incentive to operate in the informal sector: tax evasion can be an alternative source of funding than bank credit. Therefore, in the presence of a banking system rationing credit to small firms, they may use evasion as an alternative source of financing. In this case, therefore, the causal link runs from the credit constraints to the choice of working in the informal economy.

It clear that in examining the links between the credit market and the weight of undeclared businesses there is the risk of vicious circle: greater restrictions generate greater tax evasion, which in turn generates further restrictions in the channels of the bank loan.

Hence, the bulk of the story our data tell is that to help territories in promoting new business formation, the working of the credit markets is the crucial issue. In terms of policy, an effort by the Government to remove the barriers of access to the credit market in particular for micro and small
business, might have important by sides effects in terms of lower criminal activities. In fact, the use of tax evasion as a self-financing device would be discouraged and the need to resort to illegal credit market too.