



Does judicial efficiency improve productivity? Evidence from Italian farms.

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ABSTRACT

Economic literature shows that credit constraints have a negative impact on farm performance. The problem of credit constraints is particularly severe for the Italian agricultural sector given the structure and the legal status of most farms. The difficulties in providing collateral is even greater in the case of sole holders who represent almost 96% of whole Italian farms due to the direct link between farm and private capital. Credit market performance may be affected by judicial efficiency that guarantees the enforcement of contracts. We use court judicial efficiency as an instrument and exploit the great heterogeneity in efficiency of Italian courts across time and provinces to estimate the causal impact of credit constraints on farms' productivity. We find that less credit constrained farms have a higher Total Factor Productivity. We also find that Italian farms, when faced with a less efficient judicial system, are less credit constrained, probably because banks tend to grant mainly subsidized loans.

Keywords: Total Factor Productivity, credit constraints, judicial efficiency

PAPER

1. Introduction

Our study fits into two important current policy debates in Italy: credit constraints and judicial efficiency. In particular, we investigate the impact of the credit market, through judicial efficiency, for the Italian farming sector. As far as we know, there is no study investigating the relationships between judicial efficiency, availability of credit and economic performance of agricultural holdings.

Many contributions to the economic literature deals with the negative impacts that credit constraints have on farm's investment (Carter and Olinto, 2003; Petrick, 2004b), output (Petrick, 2004a), profit (Foltz, 2004; Fletschner et al., 2010) and productivity growth (Guirkinger and Boucher, 2008). Other studies argue sometime, due to some peculiar settings, credit constraints may have a positive effect on farm productivity (Sabasi and Kompaniyets, 2015) and technical efficiency (Maietta and Sena, 2010).

Other studies analyse the debt structure according to debts length and reach contrasting results (Lambert and Bayda, 2005; Mugeru 2012). While another important part of the agricultural economic literature aims at measuring and empirically analysing the presence of credit constraints (Petrick, 2005; Blancard et al, 2006). As far as agricultural credit market institutions are concerned, in Italy the main creditors are commercial banks, regulated by the National Central Bank. Data for Italy show that the cost of credit for the agricultural sector is higher than for other sectors and varies geographically, being higher in the central and southern regions.

Previously in Italy farm credit was regulated by special regimes that allowed for better conditions of credit access to farmers and amounted to genuine agricultural policy instrument. With several interventions, among which the Legislative Decree 385/93, the introduction of Basil rules and Legislative Decree 141/2010, those special conditions were greatly reduced and the guarantee scheme became more relevant in the relationships between farmers and the credit system (Adinolfi and Capitanio, 2008).

Italian farms are mostly characterised by small size and sole holder, a legal status for which it is difficult to distinguish between farm and private capital, and are generally not required to publicly disclose their financial situation. This is a problem since, due to the de-specialization process of the Italian banking system aforementioned, the rules for the determination of farm credit worthiness are mainly based on financial statement information¹.

¹ The importance of credit access for the Italian agricultural sector is confirmed by two recent Protocols of Agreement signed in 2016. The first one was signed in January by the Italian Ministry of Agriculture and Bank Intesa Sanpaolo, a leading bank in Italy and the second one was signed in March between Italian Ministry of Agriculture and the Italian Banking Association. The issue of farm credit has also been investigated by a recent cognitive survey carried out by the Agricultural Commission Chamber of Deputies, Camera dei deputati XIII Commissione Agricoltura (2015).

In Italy, the lack of collateral is also reported to be one of the main reasons for rejecting farms' credit applications along with poor credit history of the applicant and insufficient farm business income (Jansson et al, 2013).

Credit market performance is affected by judicial efficiency²; an efficient judicial system that guarantees the enforcement of contracts is crucial for the smooth functioning of the credit market, while an inefficient judicial system increases transactions costs and reduces the efficiency of the credit market.

With Italian data, Jappelli et al (2005) showed that improvements in judicial efficiency reduce credit rationing and increase the volume of lending. With an investigation at firm level within the European Union, Maresch et al (2015), show that the better the judicial enforcement system and the higher the creditor protection, the lower the probability that the firms are credit constrained. Fabbri (2010) investigates performances of judicial districts in Spain and finds that differences in the length of civil trials affect the cost of lending.

The mentioned economic literature on the impact of judicial efficiency on credit market does not take into consideration specifically the agricultural sector, for which the Italian bankruptcy law cannot be fully applied (Caiafa, 2012). Moreover, the surveys conducted by the Bank of Italy on the management of debt collection procedures by the biggest Italian banks do not allow to analyse specifically the case of non-performing loans granted to farmers (Generale and Gobbi, 1996 and Carpinelli et al, 2016). Bearing in mind the aforementioned limits, for Italy, the incidence, in terms of amounts, of judicial procedures carried out by banks to recover non-performing loans is estimated around 60% of the 2011-2014 average, the rest being conciliations in extrajudicial settings (Carpinelli et al, 2016).

In this paper, we will use court judicial efficiency as an instrument and exploit the great heterogeneity in the judicial efficiency of Italian courts across time and provinces to estimate the causal impact of credit constraints on farms productivity.

Indeed, Italy provides a good environment to test this causality because the same laws apply across the entire territory but judicial efficiency vary widely across courts.

2. Data and Empirical strategy

The main dataset we use in this paper is the Italian Farm Accountancy Data Network (FADN) for the period 2008-2013. FADN³ is an annual sample survey carried out in EU Member States for evaluating the incomes and business operation of agricultural holdings and the impacts of the Common Agricultural Policy. Italian farm accounts survey contributes to EU FADN with the major proportion of total Farm Returns and collects also additional information. We restrict our sample to farms specialised in the following general type of farming (TF): field crops, horticulture, permanent crops and grazing livestock.

As the aim of the paper is to investigate the relationship between credit constraint and farms' productivity, we use the Total Factor Productivity (TFP) as measure of farm performance.

In the estimation of production functions one of the critical points is that labor and other inputs cannot be treated as independent variables. To address this issue we employed the estimation procedure suggested by Olley and Pakes (1996) and further developed by Levinsohn and Petrin (2003). We estimated TFP at the level of principal TF using value added as output, and labor, land and fixed tangible assets as inputs⁴. Following the approach of Musso and Schiavo (2008) for identifying and measuring the degree of financial constraint, we built a synthetic index using eight dimensions: size (total fixed assets and total current asset), profitability (return on total assets: operating income over total assets), liquidity (total current assets over current liabilities), self-financing capacity (net income over total assets) and solvency (net worth over total liabilities). Moreover, following Adinolfi et al (2012), we considered the peculiarity of agriculture and added three other dimensions: total utilised agricultural area, land/area (agricultural land, buildings and forest over total utilised agricultural area) and investments/land (new investments over agricultural land, buildings and forest). For each of these dimensions, we computed the distance of the value of farm from the average of all the farms belonging to the same TF, and then, we placed the value of the distance in one the quintiles in which the corresponding distribution is divided. Hence, for each farm we obtained eight scores from 1 to 5, where 1 refers to the smallest values and 5 to the highest ones.

Finally, we sum these eight scores and we obtain a synthetic index where higher values of the index are associated to lower degree of credit constraint. The index ranges from 9 to 38. In order to achieve a better interpretation of our results we standardized the score.

² The judicial efficiency has been widely discussed and several studies have been undertaken by the Italian and international scientific community - for a recent review see Ippoliti 2014.

In Italy the debate on judicial efficiency is particularly current as a result of the territorial organization reform dealing with Ordinary Tribunals, Public Prosecutor's offices and Justices of the Peace offices that aimed at reducing the number of courts, suppressing of 220 courts' detached offices and almost 480 Justices of the Peace offices (Law no. 148/2011 of 14 September 2011 and implemented by Legislative Decrees n. 155, n. 156/2012, n. 14/2014).

³ The current FADN legal base is Council Regulation (EC) No 1217/2009.

⁴ The intermediate inputs used in the estimation of the Levinsohn and Petrin method are proxied by total specific costs and intermediate overheads arising from production. It includes, among others, seed, fertilizer, animal feed, water, electricity, and fuel.

For civil and criminal justice, the Italian territory is divided into judicial areas (Circondari) which define the territorial jurisdiction for each tribunal and public prosecutors' office. These areas mainly coincide with the corresponding provinces' area (NUTS 3) with some exceptions.

Within these areas, the courts of first instance tribunals, 165 ante and 140 post territorial organization reform implemented in 2012, administer both civil and criminal justice. The 26 Courts of Appeal are the second instance courts for civil and criminal cases, their territorial jurisdiction (Distretti) are wider than those of tribunals. We use data provided by the Ministry of Justice and in order to cover the two main degrees of justice, we computed the number of trials pending divided by incoming cases (pending/incoming) both for tribunals (at the level of circondario) and Court of Appeal (at district level). In addition, to avoid potential problems that might arise due to jointly determined choices, we use one year lagged variables. Looking at the judicial efficiency, we find a great amount of geographical heterogeneity, confirming that the degree of efficiency vary greatly among circondari and generally seems to be higher in the North of Italy than in the South. The pending/incoming for tribunals range from 2.6 for Bari to 0.56 for Trento, and the pending/incoming for Courts of Appeal range from 5 for Reggio Calabria to 0.8 for Trento. We finally standardized our two indexes of court efficiency.

One of the key econometric problems when estimating the effect of financial stress on farm performance is its endogeneity, because a high level of financial stress is non-random and depends on farm unobservable characteristics. In order to solve this issue, we used an Instrumental Variable (IV) approach. A good instrument should be exogenous with respect to farm performance but, at the same time, should strongly affect the level of credit constraint. We use our efficiency variables as an instrument and exploit the great heterogeneity in the judicial efficiency of Italian courts across time and provinces to estimate the causal impact of financial constraints on farms productivity. As far as we know, an IV approach has never been used in investigating this relationship. We relied on a classical IV estimation strategy, and tried to define a measure of credit constraints and provided evidence of its effect on productivity. We estimated the following fixed effect model:

$$Y_{ijt} = \alpha + \beta_1 CC_{ijt} + \beta_2 X_{ijt} + \mu_i + \theta_t + \varepsilon_{ijt}$$

$$CC_{ijt} = \delta + \gamma_1 Z_{jt} + \vartheta_j + \rho_t + \sigma_{ijt} \quad (1)$$

Where Y_{ijt} is the (ln) total factor productivity of farm i in district j in year t , X are a set of farm size⁵ dummy, CC_{ijt} is our measure of credit constraints, μ_i is a farm fixed effect, θ_t and ρ_t are

year dummies and ε_{ijt} is a standard error term. In the first step equation, Z_{jt} is a measure of court efficiency of district j in year t , while Z_j are district fixed effects.

The fixed effect method has the advantage of controlling for any latent or not observed constant over time variable that characterizes the unit of analysis (farm and circondari). In our case, for example, the estimated fixed effects model helps to eliminate distortions caused by a possible effect of concentration of technology in the "best farms", those who have the best farm holder or which are located in the more productive areas. However, this approach does not allow us to control for changes in these same characteristics that have occurred in a farm over the period under analysis. With the year dummies, we are able to control for shock common to all the farms in the sample.

3. Results

Table 1 reports the results of the effect of credit constraint on farm productivity. In the column (1), obtained using fixed effect estimator and treating the credit constraint variable as exogenous, the results show that the coefficient of credit constraints is positive and significant: the lower is the credit constraint the higher is the performance of a farm in terms of TFP.

In column (2) we show the reduced form of our estimated equation. We find that an increase in the court inefficiency affects positively the TFP, in other words, an improvement of the civil court efficiency is associated with a decrease in the farm's productivity, and this evidence regards especially the efficiency of the Courts of Appeal.

⁵ From the accounting year 2010 farm's size is defined in terms of total Standard Output (SO) of the farm expressed in euro (Reg. (EC) No 1242/2008), previously, until the accounting year 2009, the economic size is measured as the total Standard Gross Margin (SGM) of the farm expressed in European Size Unit (Decision 85/377/CEE). Size is therefore a time varying characteristic. Using farm size we grouped the farms into three classes: Small: $SGM \leq 19.200$ OR $SO \leq 50.000$ which accounts for 34.6% of the sample; Medium: $19.200 < SGM \leq 48.000$ OR $50.000 < SO \leq 100.000$ which accounts for 26.2% of the sample; Large: $SGM > 48.000$ OR $SO > 100.000$ which accounts for 39.3 of the sample.

Table 1 - Fixed effect, reduced form and IV estimations of the effect of court efficiency on farm productivity. Court efficiency measure: the number of trials pending/incoming cases of court in each circondario and Courts of Appeal (CA). Italy, 2008-2013.

	(1) LOGTFP	(2) LOGTFP	(3) Credit Constraint(*)	(4) LOGTFP
	Treated as exogenous	Reduced Form	First stage	IV
Credit constraint	0.258*** [0.005]			0.301* [0.171]
Pending/Incoming Tribunal		-0.000 [0.007]	0.024** [0.011]	
Pending/Incoming Court of Appeal		0.017** [0.008]	0.034*** [0.013]	
Constant	-0.331*** [0.011]	-0.374*** [0.012]	-0.178*** [0.018]	-0.323*** [0.033]
Observations	25,939	25,939	25,939	25,939
R-squared	0.172	0.012	0.172	0.329
Number of id	11,064	11,064	11,064	11,064
Farm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Test F			5.92	

Note: (*) Farm credit constraint decreases as our score increases. *** p<0.01, ** p<0.05, * p<0.1

To control for all forms of endogeneity between TFP and credit constraint we use an IV approach. The results of the two stages of our estimations are reported in columns (3) and (4). In the first stage of IV we find that a standard deviation increase in the court inefficiency of tribunals is associated to around a 0.02 increase in our credit constraint index, i.e. the level of financial stress is reduced. In the same fashion, a standard deviation increase in the inefficiency of the Court of Appeal raises the credit constraint index of about 0.034. Therefore, the higher the court inefficiency the lower the credit constraint. This result is counterintuitive, but we may expect that farms could be quite peculiar in their access to credit market. In column (4) we confirm a positive relationship between the loosening of the credit constraint and the productivity of the farms. All columns include, other than farm fixed effects, size dummies and year dummies.

Overall, our results have two important implications. First of all, they confirm a positive role of the loosening of the credit constraint on the performance of the farms. Secondly, an increase in the court inefficiency reduces the credit constraints faced by each farm. This result may be a puzzle, but we have to consider that the farms are quite peculiar in their debt structure. In order to find a plausible explanation for this counterintuitive result, we explored the official data about subsidized loans to agriculture delivered by the Bank of Italy for the period 2008-2013. These loans are supported by specific incentivizing laws that granted interest rates lower than the market's ones. We divided each regional amount of subsidized loans by the number of farms in each region⁶. We then run a fixed effect regression at the circondario level, and found that whenever the judicial system becomes less efficient, the amount of subsidized loans increases. It seems that in those areas where the courts are less efficient, and subsidized loans are available, banks tend to lend money using this channel instead of the unsubsidized ones. Farms benefit from the subsidized loans that are cheaper and their productivity increases.

4. Conclusion

Our study fits into two important current policy debates in Italy: credit constraints and judicial efficiency. In particular, we investigate the impact of the credit market, through judicial efficiency, for the Italian farming sector. As far as we know, there is no study investigating the relationships between judicial efficiency, availability of credit and economic performances of farms. We exploit the heterogeneity in the judicial efficiency of Italian courts across time and provinces to estimate the causal impact of financial constraints on farms productivity. We find that the loosening of the credit constraints increases the performance of the farms. Secondly, an increase in the court inefficiency reduces the credit constraints faced by each farm. This result may be a puzzle, but we argue, with caution, that probably a relationship between the judicial system and the structure of farms debt does exist. Whenever the inefficiency increases, and subsidized loans are available, banks tend to lend money using this channel instead of the unsubsidized ones. Farms benefit from these subsidized loans, that are cheaper, and their productivity increases. This puzzle deserves further investigations and future research should try to discover if this relationship varies according to type of farming, farm size or owner characteristics. We also believe that further progress in solving this puzzle could provide a better understanding of the relationship between credit and agriculture and shed light on agricultural policy implications.

⁶ Provided by National Statistics Office for the years 2007-2010-2013. We then interpolate to have information for the missing years.

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