THE COSTS OF SME'S FINANCIAL DISTRESS: A CROSS-COUNTRY ANALYSIS

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1. Introduction

This job aims to offer a contribution to the literature that studies the behavior and the value of a SME in financial distress.

Financial distress means severe liquidity problems that cannot be resolved without a sizable rescaling of the entity's operations or structure (Foster, 2005). Financial distress refers to the inability of the firm to pay current obligations on the dates they are due (Baldwin & Mason, 1983). Any enterprise is susceptible to financial distress if it has frequent cash shortages and few revenue streams. Therefore, small enterprises are more likely to experience financial distress. Companies facing insolvency often liquidate assets to settle debts. However, small enterprises have few assets to sell and tend to fall victim to secured creditors who focus on debt collection to the detriment of the firm (Gopinath, 1995). Several streams of research have explored financial distress. The literature on organizational decline describes this phenomenon in terms of a loss of slack or the surplus resources that cushion the firm against environmental jolts.

These studies show some limitations as they do not highlight the factors that limit or increase financial distress costs. In fact, post-crises financial costs are heavily influenced by a number of variables that characterize firm activity: intangible capital, financial partner type (local or not) and provision of financial derivative instruments; while the first two variables are useful to reduce informational asymmetries and thus to facilitate access to (re)financing, the third variable reduces the likelihood of financial crisis. In order to fill this gaps, our work identifies a survey model capable of capturing the main variables that influence financial distress costs. This model is finalized to identify a number of qualitative elements that affect financial distress costs of small and medium-sized enterprises (SMEs).

For greater clarity, we develop a definition of financial distress based on financial criteria. Thus, using an approximation of the Keasey *et al.* (2015) concept of business failure, we consider as financial distress companies those that meet some of the following conditions: (i) its earnings before

interest and taxes depreciation and amortization (Ebitda) are lower than its financial expenses for two consecutive years; and/or (ii) increase in the debt-to-net worth formula for two consecutive periods with concomitant decrease of the denominator. Other previous studies on business failure have used those proxies (Manzaneque *et al.*, 2016).

Methodologically, survey model analyzes SME samples from two European countries, Italy and Germany, whose financial and entrepreneurial systems show significant differences. Data were extracted from Bureau Van Dijk (BvD) databases and panel data methodology was used to control for potential endogeneity and unobservable heterogeneity.

The results obtained applying survey model revealing that parameters are significant and with the expected signs. More specifically, the expected financial distress costs decrease in relation SME's ability to provide themselves with intangible assets, derivative financial instruments and small partner banks (local banks).

2. Theoretical Background

The common causes of financial distress and business failure are often a complicated mix of problems and symptoms but the common causes of SMEs' failure and financial distress can be examined from different perspectives:
- the degree of bank localism;
- the size of the bank, the rating models adopted and, the degree of customer relationship;
- the endowment of invisible intangible assets;
- the endowment of derivative financial instruments;
- the country's system.

The theoretical debate about financial distress is rooted in the studies that explore the causes of credit rationing. In short, studies suggest a series of variables in computing bankruptcy likelihood. For instance, De Bruyn and Ferri (2005), and De Laurentis (2011) suggest to investigate the degree of bank localism (bank proximity). Other authors suggest to investigating the size of the bank, the rating models adopted and, the degree of customer relationship (Berger and Udell, 2006; Modina *et al.*, 2013; Formisano, 2016).

The endowment of intangible assets not visible on the financial statements can affect the financial distress of the enterprise. In this regard there are two different schools of thought. The first current of thought states (Degryse *et al.*, 2010; Roulstone, 2011; Campello and Giambona, 2011; Marrocu *et al.*, 2012; Koksal *et al.*, 2013; Lim *et al.*, 2014; Bulot *et al.*, 2015; Cucculelli and Bettinelli, 2015): «Firm speci-

fic skills, invisible in the budget and that escapes from the traditional analysis, are strategic factors to get out of the business crisis or to alleviate bankruptcy/financial distress costs». More specifically, part of this school of thought states that firm specific skills it allows to get (re)financing under economic conditions to restructure their business. The second school of thought, on the other hand, points out that intangibles not visible at the accounting level are a source of problems which ultimately reflect negatively on the company's ability to contain financial distress costs. In this regard some authors point out that the high intangible capital endowment, since it is not easily perceivable and quantifiable by stakeholders outside the firm, it determines significant information asymmetries between shareholders/management and third lenders (Jostarndt and Sautner, 2010; Gennaioli and Rossi, 2010). These information asymmetries increase when the lender adopts transaction-based banking model rather than relationship-based model, which favour the collection of quantitative and standardized information (hard information).

The theoretical debate about financial distress it lights up further with the analysis of the role of derivatives. Empirical studies show that bankruptcy costs is a further source of incentive for the use of derivatives. In particular, the results of the empirical studies suggest that the use of derivatives and risk management practices are broadly consistent with the predictions from the theoretical literature, which is based upon value-maximising behaviour. By hedging financial risks such as currency, interest rate and commodity risk, firms can decrease cash flow volatility. By reducing the cash flow volatility, firms can decrease the expected financial distress and agency costs, thereby enhancing the present value of expected future cash flows. In addition, reducing cash flow volatility can improve the probability of having sufficient internal funds or attract funding to get out of the financial crisis or to mitigate exit costs from the market. An interesting empirical insight based on this rationale is that firms characterized by specific skills that are faced with high costs of raising funds under financial distress will be more motivated to hedge against risk exposure than average firms. This rationale has been explored by numerous scholars, among others by Haushalter (2000), Mello and Parsons (2000), Allayannis and Ofek (2001) and Haushalter *et al*. (2002).

Our analysis of literature ends with a further aspect: the country's system. The aspects analyzed so far in the literature have to be interpreted in relation to the political, financial and entrepreneurial system of the country. German SMEs (so-called Mittelstand) have their own peculiarities to Italian SMEs. Their business policies tend

to be especially long-term. The "German Mittelstand" companies are some of the most innovative in Europe: 54% of them launched an innovation onto the market in the 1999 - 2006 period. The "German Mittelstand" relies on sound financing models - chiefly equity and bank loans. The high equity ratio and a cautious approach to expansion enable the companies to undertake medium-term and long-term investments, even in times of crisis. Government supports the "German Mittelstand" on key issues like investment in R&D, the skills shortage, foreign trade and investment, financing needs, company start-ups and company hand-overs. The empirical evidence indicates that Germany's Mittelstand is exploiting its full potential to raise funds via alternative financing instruments (Casey and O'Toole, 2014). It should be noted, in particular, German government's policy to achieve a tax and accounting system capable of encouraging the use of derivatives. The same is true for the use of public support programmes given. Unlike bank-firm relationships in Italy, Germany ones have own features (Hainz and Wiegand, 2013): i) Mittelstand companies have close, confidential and long-term-oriented relationship with one main bank, their "house bank"; ii) companies are willing to disclose sensitive economic data; iii) relatively easy access to long-term bank loans, even under difficult economic circumstances; iv) broad supply of public (financial) support programmes on national and Land-level, delivered mainly via house banks; v) the German "house bank" system valorize soft information in rating systems (through-the-cycle ratings).

3. Research hypothesis and data

Most of the data used in the paper are taken from databases maintained by Bureau Van Dijk: Orbis (is the world's most powerful comparable data resource on private companies), Amadeus (a high quality European database), Aida and Mint Italy. From these databases, we gather information on the firm specific data, ownership data, and accounting data for every German and Italian company that satisfies a maximum size threshold.

For Germany and Italy, the databases includes all companies that meet the following criteria: (1) revenues not exceeding €20 m, (2) less than 250 employees, (3) organized in the form of Ltd. Our sample period starts in 1999 (the first year for which we can gather ownership data from the DVDs) and ends in 2006 (the last year before the outbreak of the crisis).

Statistics are based on a sample of approximately 37.787 SMEs and covers the 0.38% of the universe of small and medium sized enterprises active in Italy and in Germany at the end of 2006. The investigation has required

385.671 statistic observations. We consider two measures of risk of bankruptcy. The first measure, Ebitda, is a measure of the degree of financial stress. The intuition is simple: the lower the Ebitda, the greater the company's inability to cover financial expenses. The second, debt-to-net worth, is a measure of the degree of fragility of the entire financial structure; we classifyas deteriorated the financial structure that introduces a increasing in the debt-to-net worth formula for two consecutive periods with concomitant decrease of the denominator. A firm is also considered as financially distressed in the year that immediately follows these events.

From this classification, we can build a variable that captures the probability, ranging from 0 to 1, of a firm becoming financially distressed. We expect this financial distress likelihood to have a positive impact on the cost of financial distress.

In the light of our considerations, we formulate four research hypotheses. Our first hypothesis is [*H1*]: «There is a positive relationship between financial distress likelihood and (ex-ante) financial distress costs. This relationship is considered valid regardless of the country of origin of the enterprise». The analysis continues with the formulation of further three research hypotheses that show, regardless of the country of origin of the enterprise, the negative relationship with the expected financial distress costs (ExpFDC): Intangible assets (hypothesis 2), Banking localism (hypothesis 3) and Derivative financial instruments (hypothesis 4).

With reference to the hypothesis 2 it is believed that the endowment of intangible assets (invisible as regards accounts) on the total assets of a firm [INTAN] is a measure of its ability to do according to a long-term strategic logic and value oriented and so to get (re)financing under economic conditions to restructure the business. For the enterprises subject to restructuring, there are some focal aspects (Buckmaster, 2000; Unger, 2000; Joia, 2000; Ching and Yang, 2000; Harris and Ogbonna, 2001; Dubrovski, 2001; Hoque *et al.*, 2001; Schwarz *et al.*, 2002; Catasùs and Gröjer, 2003; Katcher, 2003): clientele's quality, contractual power with the suppliers, reliability of the plans and sustainability of the investments, R&D investment, process control systems, management skills, credibility of management, brand development, investment in training, after sales, entrepreneurship and management experience, business continuity, and governance. Such data have been picked after an access to BvD databases. The data have opportunely been quantified through a scoring and normalization process and in order to get homogeneous values among 0 and 1 (Min. 0 - Max 1).

For example, Orbis database use qualitative scores to help improve the accuracy of financial strength assessments. These qualitative scores are based on credit rating agency ModeFinance's research on and use of non-financial information, including: Clientele's quality, Contractual power with the suppliers, Reliability of the plans, R&D investment, Process

Control Systems, Investment in training, Sustainability of the investments, Brand development, Credibility of management, After Sale, Entrepreneurship and management experience, Continuity of the firm, Governance. Each qualitative data is scored by Orbis on a scale of twenty-eight to forty-four, forty-four being the highest.

Scores obtained from the single variable were subjected to normalization (Min. 0 - Max 1). The formula used to normalize the scores of the single variables is shown below:

Norm. single variable (e.g. Entrepreneurship and management experience) = 0 + [(average score of total sample - MIN (score of total sample)] ÷ [(MAX (score of total sample) - MIN (score of total sample)] × (1 - 0)

Table 1 highlights the main results of the normalization process.

Tab. 1: normalization process

Focal aspects	Scoring	N. Obs. Total sample	N. Obs. Italian sample	N. Obs. German sample	Average score Total sample	Norm (0-1) Total sample
Clientele's quality	Min 28; Max 44	37787	25715	12072	29	0.20161
Contractual power with the suppliers	Min 28; Max 44	37787	25715	12072	33	0.45641
Reliability of the plans	Min 28; Max 44	37787	25715	12072	30	0.43323
R&D investment	Min 28; Max 44	37787	25715	12072	35	0.59692
Process Control Systems	Min 28; Max 44	37787	25715	12072	32	0.40006
Investment in training	Min 28; Max 44	37787	25715	12072	34	0.56014
Sustainability of the investments	Min 28; Max 44	37787	25715	12072	31	0.48897
Brand development	Min 28; Max 45	37787	25715	12072	37	0.78961
Credibility of management	Min 28; Max 45	37787	25715	12072	40	0.80010
After Sale	Min 28; Max 45	37787	25715	12072	43	0.89988
Entrepreneurship and management experience	Min 28; Max 45	37787	25715	12072	41	0.82243

Business continuity	Min 28; Max 45	37787	25715	12072	39	0.78013
Governance	Min 28; Max 45	37787	25715	12072	38	0.72215

Source: our elaboration on BvD data

Accordingly, the second research hypothesis affirms as follows [*H2*]: «There is a negative relationship between SMEs' invisible intangible assets and expected financial distress costs (ExpFDC). The greatest endowment of intangible assets determines the reduction of the expected financial distress costs. This relationship is considered valid regardless of the country of origin of the enterprise».

Without prejudice to the previous considerations, our research is enriched with the formulation of the following hypothesis [*H3*]: «The negative relationship between SMEs' invisible intangible assets and expected financial distress costs is more evident for the SMEs that relate to local banks. This relationship is considered valid regardless of the country of origin of the enterprise».

The third hypothesis of research is verified using a dummy variables "LOCALB". In particular, we would use a 0,1 dummy variable where a firm is given a value of 1 if is a client of a local bank or a 0 in case of presence of a national and/or international banking group. The typology of partner bank of the enterprise has been individualized by accessing to BvD databases. This variable influences our model in the part that considers the weight of the invisible intangible assets on total assets [INTAN]; the dummy LOCALB variable assumes a critical role in estimating the effects of the intangibles on the expected financial distress costs.

With reference to the fourth and last hypothesis, Smith and Stulz (1985) show that bankruptcy costs is a further source of incentive for the use of derivatives. In fact, by reducing the fluctuations in corporate flows, hedging through derivatives makes it possible to reduce the likelihood of a financial crisis, which can lead to extremely critical situations such as bankruptcy, liquidation or, at the very least, corporate restructuring and the need to bear direct costs (legal costs, administrative costs and the lesser value attributed to assets at the time of liquidation) and indirect (loss of image and consequent reduction in contractual power) of a very high amount.

Based on this model, the likelihood of using derivatives is greater for companies with high financial loss costs. If these costs, as Nance, Smith and Smithson (1993) point out, are a fixed component, then smaller companies will be the ones that will most effectively use hedging derivatives because they have a stronger impact on the

fixed component of costs. In addition, given the ability of derivatives to reduce the company's default probability, they also make it possible to increase the level of indebtedness and thus the value of the enterprise.

In particular, this theory was developed by Stulz (1984), which suggests that by reducing the volatility of company profits and hence the likelihood of financial stress, the company is able to increase its potential debt capability.

If companies increase leverage in response to this higher debt capability, the associated increase in financial burdens will lead to a reduction in taxation and, consequently, an increase in the value of the company.

Starting from the foregoing considerations, the following search hypothesis is examined [*H4*]: «There is a negative relationship between SMEs' derivative financial instruments and expected financial distress costs (ExpFDC). The greatest endowment of derivatives determines the reduction of the expected financial distress costs. This relationship is considered valid regardless of the country of origin of the enterprise».

With reference to the hypothesis 4 it is believed that the endowment of derivative financial instruments on the total assets of a firm [DER] - shows the amount of derivative financial instruments as a percentage of total assets - is a measure of its ability to reduce the likelihood of financial distress.

Our model was designed to provide a representation of the value loss of SMEs in financial crisis.

This section clarifies how "probability of financial suffering" and "ex-post financial aid costs" can be useful drivers in building a model for estimating ex-ante financial distress costs.

In literature we see a rich literary production engaged in the formulation of ex-ante models to estimate the financial distress likelihood (FDL).

Particularly, Grice and Ingram (2001), Pindado *et al*. (2008), Keasey *et al*. (2015) and Gupta *et al*. (2015) underline that the seminal models by Beaver (1966), Altman (1968, 1984) and Ohlson (1980) are revealed suitable in the classification of the sector (better for the manufacturing enterprises) but poorly sensitive to the typology of financial distress of the enterprise. To analogous conclusions the studies of Zmijewski (1984) are reached.

4. Empirical model

The aim of this section is to outline the empirical approach that we use to analyse the FDL. In this regard, we fellow Pindado *et al*. (2008) and Keasey *et al*. (2015), where FDL is specified as a function of three ratios (1):

$$\log\left(\frac{\text{Prob}(\text{Insolvency})}{\text{Prob}(\text{NoInsolvency})}\right) = \beta_0 + \beta_1\left(\frac{\text{EBITDA}_{it}}{\text{TA}_{i-1}}\right) + \beta_2\left(\frac{\text{FE}_{it}}{\text{TA}_{i-1}}\right) + \beta_3\left(\frac{\text{RE}_{it-1}}{\text{TA}_{it-1}}\right) + \varepsilon_{it} \quad [1]$$

This model was chosen because the work of these authors provides evidence that they could obtain a more stable model of FDL in terms of magnitude, sign and significance of the coefficients, using the proposed panel data methodology.

The first ratio can be interpreted as the capacity of the firm to generate operational funds from its assets, independently of any tax, amortization or leverage factors (EBITDA is calculated by adding back the non-cash expenses of depreciation and amortization to a firm's operating income). It is also the main driver of liquidity, conditioning the capacity of the firm to extend credit or renegotiate payments. The second ratio portrays the impact of the weight of financial expenses on the financial distress likelihood and like the other variables in the model, it is scaled by total assets. When this ratio rises, the probability of not being able to comply with its financial obligations is expected to increase. Finally, the ratio of retained earnings represents the cumulative profitability over time, and highlights the usefulness of past profitability in predicting future results and the capacity for self-financing.

FDL variable originates from proposed regression model; its value ranges between 0 and 1. It appears evident as the FDL variable has a positive impact on the (ex-ante) financial distress costs (ExaFDC).

The total value loss of a firm's assets during financial distress, measured at the end of the period of financial crisis is the ex-post financial distress cost (ExpFDC). We can formulate these ex-post costs as a discount factor of the Future Value of the firm, consistent with our formulation of ExaFDC.

Because the majority of these costs have an unobservable nature the discount rate is a function of variables defined earlier as the main determinants of the impact of financial crisis.

Furthermore, because of our expectation of the cost financial distress depends of the financial distress likelihood, we can write the expected costs of financial distress as the weighting of ExpFDC by

the likelihood of financial distress (2):

$$ExaFDC \cong ExpFDC \times FDL \quad [2]$$

Since the value of the of financial distress likelihood (FDL) always ranges from 0 to 1, the ex- ante estimated insolvency costs variable take the highest values when FDL and ExpFDC are high. The lowest values of ExaFDC are obtained when FDL is near zero and ExpFDC are low.

If we take into consideration our definitions of ExaFDC, we obtain a factor that stands for the expected proportion of value loss due to financial distress can be defined as the product between the FDL and a proportion value loss when it occurs (3):

$$ExaFDC = FDL \times e^{\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots + \beta_n X_n} \quad [3]$$

The coefficients of the variables $\beta_1 X_1$, $\beta_2 X_2$, $\beta_3 X_3$, $\beta_n X_n$ presented earlier, are the main determinants of the bargaining position of different claimants during financial distress.

The model experimented here and borrowed by Keasey *et al.* (2015) quantifies ExpFDC as a function of three determining variables: i) the enterprise ability to equip itself by intangible assets (invisible as regards accounts); ii) the privileged relationship with the local banks (reduce asymmetric information) and, iii) financial derivatives usage by SME.

Given that estimating a linear model has a lot advantages from an econometric point of view, we take natural logarithms of both sides of the last equation of the previous section and we obtain the following model (4):

$$\varphi = \frac{1}{\tau} \; LnFDL + \frac{\beta_1}{\tau} \; X_1 + \frac{\beta_2}{\tau} \; X_2 + \frac{\beta_3}{\tau} \; X_3 \dots + \frac{\beta_n}{\tau} X_n \quad [4]$$

LnFDL is the natural logarithm of financial distress likelihood and τ is the horizon of time over which firms formulate expectations for the resolution of financial distress.

Consequently, the estimated coefficients α_1, α_2 and α_3 represent the adjustment rate of the value of the firm due financial distress, devided by the number of periods till the resolution of financial distress (5):

$$\alpha_1 = \frac{1}{\tau}; \; \alpha_2 = \frac{\beta_1}{\tau}; \; \alpha_3 = \frac{\beta_2}{\tau}; \alpha_4 = \frac{\beta_3}{\tau} \quad [5]$$

The model therefore sees the following equation (6):

$$\varphi_{it} = \alpha_1 LnFDL_{it} + \alpha_2 X_1 + \alpha_3 X_2 + \alpha_4 X_3 + \varepsilon_{it} \quad [6]$$

Equation 6 is completed with the attainment of the influential variables in our model (7):

$$\varphi_{it} = \alpha_1 LnFDL_{it} + \alpha_2 INTAN_{it} + \left(\alpha_3 + \lambda_1 LOCALB_i\right) INTAN_{it} + \alpha_4 DER_{it} + \varepsilon_{it} \quad [7]$$

All the variables in formula 7 are scaled by total assets in order to reduce frequently heteroskedasticity problems presents in regression models. In this model, the disturbance term, ε_{it}, is composed by the following investigation elements: $\varepsilon_{it} = \eta_i + d_t + v_{it}$, where v_{it} is a statistical fluctuations (error), and d_t is a yearly dummy variable reflecting macroeconomic factors. Finally, η_i is the SME individual effect; in this study, this variable capture those individual-specific effects that are time constant and impact on financial distress costs. Table 2 shows the number of firms from each country.

Tab. 2: structure of the samples by country

Country	Firms
Italy	25000
Germany	12072
Total	**37072**

The descriptive statistics of the model's variables are reported in table 3.

Tab. 3: descriptive statistics of the total sample

Variables	Mean	SD	Minimum	Maximum
ExaFDC	-0.077	0.687	-2.798	0.579
LnFDL	-1.896	1.723	-6.988	-0.098
INTAN	0.457	0.158	0	1
DER	0.098	0.355	-2.987	0.689

Source: our elaboration on BvD data

Since there is no fixed rule for dealing with outliers we use the procedure of trimming the data to the 99th percentile, as a general rule of thumb.

5. Results and discussion

As can be in table 4, all the coefficients are statistically significant and of the expected sign. Additionally, the m_2 test guarantees that there is no second-order serial correlation. We also performed a Wald test (z_i) of the joint significance of the dummies which is always positive, providing evidence that we need to control for the macroeconomics events that tend to influence all firms.

Tab. 4: estimation results

Model	Basic (Total sample)	LOCALB adj. model	Italian sample	German sample
N. of SMEs	37787	37787	25715	12072
τ	11.09	10.7	12.01	8.4
$LnFDL_{it}$	0.0999 (0.0000)	0.0883 (0.0000)	0.0823 (0.0000)	0.0900 (0.0000)
$INTAN_{it}$	-0.2258 (0.0000)	-1.7867 (0.0000)	-0.1832 (0.0000)	-0.7811 (0.0000)
$LOCALBINTAN_{it}$	-	-1.5678 (0.0001)	-1.4001 (0.6333)	-1.6956 (0.3410)
DER_{it}	-1.0006	-1.1445	-1.5367	-1.8874
z_1	758.2323	326.0089	500.6897	482.3666
z_2	206.2199	212.3456	199.2624	202.5589
t_1	-	9.0000	-	-
t_2	-	11.1025	-	-
m_1	0.0000	0.0000	0.0000	0.0000
m_2	0.0456	0.1022	0.0689	0.0489
m_3	0.5598	0.6589	0.5001	0.4589
Hansen	1658 (33)	1879 (105)	1101 (52)	1178 (78)

Source: our elaboration on BvD data

We ran a regression analysis using panel previously described (Normal: 68.2%; Financial distressed: 31.8%).

It should be noted that logistic regression is a powerful tool, especially in financial studies, as it allows multiple explanatory variables being analyzed simultaneously, meanwhile reducing the effect of confounding factors.

In future studies, we shall include further means such as Conic Multivariate Adaptive Regression Splines (CMARS), Robust Conic Multivariate Adaptive Regression Splines (RCMARS) and Conic Generalized Partial Linear Models (CGPLM). These methods can help to give new perspectives and developments in financial mathematics to make more accurate predictions about financial distress likelihood.

Several studies have been carried out to apply the above methods to various fields of study including finance, industry, business and environment. These include: Özmen *et al*. (2010), Özmen *et al*. (2012), Weber *et al*. (2012).

With reference to our study, the variables investigated are: LnFDL, INTAN, LOCALBINTAN and DER.

The empirical evidence corroborates our initial hypothesis.

As shown in column 1 of table 4, the positive coefficient of the FDL variables confirms hypothesis 1 [*H1*] and supports the evidences emerged by Keasey' studies (Keasey *et al*., 2015) that the FDL is one of the main explanatory variables of financial distress costs.

Additionaly, to confirm the second hypothesis [*H2*], we find empirical evidence supporting the negative relationship between SMEs' invisible intangible assets and expected financial distress costs, since the coefficient $(\text{ß}_{1-\text{Total sample}} \div \text{т} = -0.2258)$ obtained for INTAN_{it} is negative and significant.

The third hypothesis [*H3*] is tested using the dummy LOCALB_{it}. The negative relationship between SMEs' invisible intangible assets and expected financial distress costs (ExpFDC) is more evident for the SMEs that relate to local banks: $\text{ß}_{2-\text{Total sample}} \div \text{т} + \lambda_1 \div \text{т} = -0.2258 - 1.5678 = -1.7936$. This finding confirms the results that emerge from the doctrine: the ability of local banks to attenuate information asymmetries that, especially in the phases of restructuring for financial distress, are critical in the bank-firm relationship.

The fourth hypothesis [*H4*] is tested using DER_{it}. As shown in column 1 of table 4, the negative term $(\text{ß}_{3-\text{Total sample}} \div \text{т} = -1.0006)$ confirms our hypothesis 4. In line with the evidence emerged by literature review, the greatest endowment of derivatives determines the reduction of the expected financial distress costs.

Moreover, the results obtained from our cross-country comparison, provide additional evidence. Without prejudice to previous assumptions, Germany, compared to Italy, recorded more significant coefficients. Considering the first hypothesis [*H1*] as universally valid, the most significant differences can be found in the other three hypotheses of research. In summary, German SMEs have their own peculiarities to Italian SMEs (Abel-Koch *et al*., 2015).

With regard to the second hypothesis [*H2*], the largest coefficient $(\text{ß}_{1-\text{German sample}} \div \text{т} = -0.7811)$ is justified by Germany's highest R&D investments: 33% of German companies invest 1% in R&D (24% invest 2%, 18% invest 4%, and 25% invest more than 4%).

A key to the success of the "Made in Germany" strategy is, moreover, the After Sales, organized efficiently, precisely and in a very short time. Another important factor contributing to the success of the German Industry is the Common Labor Market - synergies through industry training - which shows that there is less competi-

tion in Germany than Italian reality. Certainly, greater financial solidity has been a key driver of the creation of world-leading industry leaders. While the suffering in Italy is 3 times higher than in Germany. Another interesting fact is that 61% of Mittlestand has an Advisory Board or Supervisory Board and 67% of the Advisory Board is made up of owners of other companies.

Business continuity, entrepreneurship and management experience are also important drivers in generational steps.

With reference third hypothesis [*H3*], the coefficient recorded by the German sample ($\beta_{2-\text{German sample}} \div \tau + \lambda_1 \div \tau = -2.4767$) is more significant than the Italian one and in line with our hypotheses. As mentioned earlier, there are several factors that justify these differences. Mittelstand companies show strong relationships with local banks and, in particular, the German "house bank" system valorize soft information in rating systems. This is for the benefit of firms that have skills that are not visible at the accounting level. In addition, the German banking system is characterized by maximum transparency. For example, in Germany, under the Initiative Finanzstandort Deutschland (IFD), banks tell enterprises their rating. In the context of the implementation of the Basel III Accord and to improve financial dialogue between the financial community and the public, IFD, working with the German banking associations, developed a brochure that explains in layman's language the nature of internal and external ratings and the advantages of ratings for SMEs. Although the IFD has been superseded, this brochure is still often referred to as a standard of quality and has contributed to the development of a "rating culture" in Germany.

With regard to the fourth hypothesis [*H4*], German financial system shows peculiarities respect Italian system ($\beta_{3-\text{German sample}} \div \tau = -1.8874$). These peculiarities concern the use of derivatives. Compared with Italian companies, German companies are more likely to use derivatives: 78% of German SMEs than 24% of Italian SMEs. As previously mentioned, German government's policy has been active to ensure a tax and accounting system capable of encouraging the use of derivatives. German firms are more likely to use derivatives than Italian firms. This is consistent with Germany being a open more economy, leading to greater exposure of its firms to financial price risk, especially foreign exchange rates and commodity prices.

Italian companies use less derivatives than German companies. The use of derivatives is more significant among large companies for each category of risk suggesting the presence of economies of scale in the use of such tools. The most heavily hedged type of risk is the exchange rate risk followed by interest rate risk and ultimately credit risk. A recent Bank of Italy's annual report highlights that category of financial risk hedging services presents the most modest use grade. It also emerges that the SME has a low ex-ante perception of exchange rate risk and, above all, the risk

of interest. In addition, entrepreneurs are experiencing strong commercial pressure from banks on this product category, which is not balanced by proper coordination with financing operations.


6. Conclusions

In conclusion, the results of our work are in line with those emerging from the literature that consider the value loss of the enterprise in financial distress strongly correlated to the following aspects: i) the endowment of invisible intangible assets (Degryse *et al.*, 2010; Roulstone, 2011; Campello and Giambona, 2011; Marrocu *et al.*, 2012; Koksal *et al.*, 2013; Lim *et al.*, 2014; Bulot *et al.*, 2015; Cucculelli and Bettinelli, 2015), ii) bank proximity (Modina, 2015; Formisano, 2016), iii) derivative financial instruments (Stulz, 1984; Smith and Stulz, 1985; Nance *et al.*, 1993).

The estimate of the variables LnFDL, INTAN, LOCALBINTAN and DER is useful in building a "matrix" capable of suggesting, at country level, policies for Italian SMEs for tackling the crisis as well as to mitigate the costs of exit from the market (figure 1).

SMEs have financial constraints that, compared with large companies, diminish the benefits of their expertise.

Fig. 1: Policy Matrix
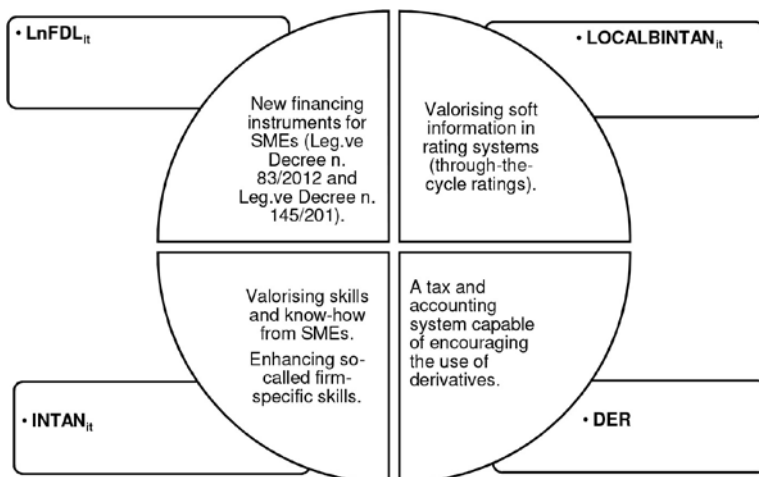
Source: our elaboration

As evidenced by the results of our research, expected financial distress costs are intimately linked to a number of variables considered influential in this analysis: the intangible assets, the close relationship with local

banks and, the use of derivative instruments commonly used for risk management. German firms compared with Italian ones are more immune to financial distress phenomena and have been able to develop antidotes useful to face the crisis painlessly; the motives are different and must be sought in entrepreneurial culture and in the decisive role of Germany's government and local banks to support SME development policies.

German SMEs developed market leadership in global niches thanks to the high capacity of innovation and traditional skills that have kept pace with the technological innovation at a global level. Germany's government acknowledges their importance, and in 2012 launched an initiative to make "German Mittelstand" logo a quality brand that helps businesses both in expanding on global markets and skilled workers recruitment.

The critical role of SMEs in Germany justify the existence of governmental programmes that support their development. In general, the policy of the financial support for the SMEs in Germany is concentrated on the promotion of the investment process, leaving the short-term financing to the private and cooperative bank sector. As a result, a strong relationship between cooperative banks and credit boxes is registered in the SMEs's financing. In the financial field, the hybrid instruments are what is considered to be the enterfloor in architecture. In Germany, the instrument named "Mezzanine Kapital" has been developed with the aim of covering the intermediate spectrum (hybrid) between the own capital and the debt during the last years (Ulrich and Hilmar, 2003). The emergency of this type of hybrid instruments originated as collateral tools of the business of the banks (operations of high performance but of high risks) in The United States and The United Kingdom in the seventies. In the eighties, the hybrid instruments were transformed into the ideal vehicle for the concision of the MBO operations and, at the same time, they were turned into an alternative for investors who look for high performances. In Germany, the hybrid instrument had an important development that helped it being transformed into the third market with a world-importance at present. Mezzanine Kapital constitutes the German version of the financial hybrid instruments whose institutionalization is given through the equity issues of participation in order to attract investors and the divisibility of the application of the fund constituted in the SMEs. Another mechanism present in Germany is the financing through the VC. Taking into account the "Own Capital" financing matter, an intensive field of VC activities through the specific legal figure over societies of participation in capital (KapitalBeteiligungsGesellschaft) has been developed in Germany since the nineties. In order for the banks to achieve a better ratio performance-risk, they may enter a business to finance the process of creation of the Mittelstand companies replacing the traditional loan scheme with the use of the financial hybrid instruments via. For instance, the equity kickers constitute a vehicle that was proved in

order to step up the performance with the receipt of the interests of both parts, agent and principal.

Local banks play an important role in Mittelstand financing. The savings and cooperative bank sector in Germany accounts for a distinctly higher share in credit financing of SMEs than in the Italy; compared to Italian SMEs, German SMEs have longer and closer relationships to their banks. In Germany, intensive competition among banks favours the establishment of long and close bank relations of SMEs, which improves the availability of loans. As shown by recent Bundesbank's annual report, banks, in particular small banks, adopt internal rating methodologies aim a through-the-cycle rather than at point-in-time rating; as already mentioned, such rating systems favor SMEs.

Financial instrument are be designed for the Mittelstand companies with due regard the investors's interests and the capital needs that the Mittelstand companies must face; in this regard, the KfW (Kreditanstalt fuer Wiederaufbau) public bank plays an important role as the country's industrial policy instrument. KfW's supports COSME's promotional activities for start-ups within the "Start-Up Loan – StartGeld". KfW's supports InnovFin's promotional activities for innovative companies. With the help of a guarantee from the European Investment Fund KfW assume 80% of the credit risk normally incurred by the banks. In many cases, this makes the loan financing possible for start-ups. The "Start-Up Loan - Universal" also enables companies to finance succession and takeover projects, an aspect that is becoming increasingly important in light of demographic changes. KfW offers a broad range of promotional programmes for SMEs financing needs, such as the "ERP Innovation Programme" or the "ERP Regional Promotion Programme". The "ERP Innovation program" supports SMEs by providing long-term loans at favourable conditions for close-to-market research and development of new products, processes or services; the aim of "ERP Regional Promotion Programme" is to promote investments in structurally weak regions at particularly attractive conditions.

Taking into consideration the German experience, the following ideas-force emerge for tackling the crisis as well as to mitigate the costs of exit from the market:

- "new financing instruments". Even though Italy shows poor financial culture than Germany, current government policies are moving in the right direction. As evidenced by a recent study (Quintiliani, 2017), at the end of 2012 the legislator intervened to facilitate the debt instruments' issuance for SMEs (mini-bonds, commercial papers, project bonds, equity crowdfunding). In fact, with the "Decreto Sviluppo" (legislative decree n. 83/2012) and "Decreto Destinazione Italia" (legislative decree n. 145/2013), they have eliminated fiscal constraints that hindered the debt capital issuance by companies not

listed on a stock exchange. The lawmaker's goal was to diversify the sources of financing for SMEs in order to reduce the credit crunch and their financial dependence from the banking system. Thanks to the new legislation SMEs, but not "micro-companies", are allowed to issue debt instruments with short term (commercial paper), medium and long-term (mini-bond, project bond, equity crowdfunding);

- "valorising soft information in rating systems". Italian banking system is strongly oriented to using cyclical internal rating systems that value hard information. Small local banks (e.g. cooperative credit banks), unlike large banks, are more willing to evaluate soft information but have some structural limits: small size, poorly qualified staff, and a supply limited at traditional bank lending activities. A new "rating philosophy" is suggested that does not neglect the relationship with the clientele and that encourages "through-the-cycle" evaluation processes capable to capture and mix the positive elements of the statistical model with the positive elements of the judgemental model;

- "valorising skills and know-how". Italian SMEs are characterized by innovation, proactivity and risk appetite, but their small size is a limit in a globalized context that lives a Fourth Industrial Revolution. In this sense, the "National Industry 4.0 Plan" is undoubtedly an important signal, and on this road it will be necessary to continue;

- "a tax and accounting system capable of encouraging the use of derivatives". The current system sees increased taxation on derivatives and their recording on-balance-sheet according to Italian Accounting Standards (OIC 32). This system discourages the use of derivatives and impacts negatively on the company's ability to mitigate financial distress. It is therefore suggested a low taxation and the recording on-balance-sheet as "memorandum item".

It should be emphasized that the present work limits its field of investigation to a few variables without fully addressing other elements of uncertainty which may adversely affect the financial distress likelihood and the value creation of the SME.

An interesting starting point for future research is indeed represented by application of additional methods (RCMARS and CGPLM) useful to mitigate the uncertainty of the forecast and capable to analyzing further variables nonlinearly (environmental, political, social and labor).

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Riassunto

Questo lavoro si pone l'obiettivo di esaminare il ruolo degli intangibili, dei derivati e delle banche locali nel determinare i costi di sofferenza finanziaria delle PMI. In letteratura esistono diversi metodi finalizzati all'analisi della probabilità di dissesto finanziario, ma molti trascurano l'importanza di cogliere l'azienda nei suoi aspetti non meramente contabili; pertanto, è stata condotta un'analisi panel tenendo conto di una serie di elementi qualitativi che influenzano i costi di sofferenza finanziaria delle piccole e medie imprese. I risultati consentono di promuovere la riflessione e stimolare il dibattito sulle politiche di sostegno alle PMI.

Abstract

This paper stresses the importance of the intangibles, derivatives and local banks in determining SME's financial distress costs. Many models exist in literature regarding the estimate of the probability of financial suffering but many of these neglect the importance of variables that are not properly accounting and that characterize business activity. Thus, an analysis was carried out to identify a number of qualitative elements that affect financial distress costs of small and medium-sized enterprises (SMEs). Findings allow to stimulating debate on policies to support SMEs.

JEL: C33- Panel Data Models; G32- Financing Policy, Financial Risk and Risk Management, Value of Firms.

Parole Chiave (Keywords): dissesto finanziario, PMI, banca locale, intangibile, strumento derivato (financial distress, SME, local bank, intangible, derivative instrument).

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