What is worth more for the merit of credit?

Evidence from the credit system in the North Eastern Italian District.

Mattia Mestroni
Department of Management - Ca' Foscari University, Venice

Guido Max. Mantovani
H.E.R.M.E.S. Universities, Strasbourg & Ca' Foscari University, Venice

Elisabetta Basilico
USG, University of St. Gallen, Switzerland & Ca' Foscari University, Venice

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Università Ca'Foscari Venezia

A pre-view

1. Recent crisis proof Basel 1 and 2 regulation bias in risk estimation
2. There is no main single stream on Basel 3 perspectives (especially on implications for SMEs)
3. Innovative foundations to a new rating system must be searched
4. We present evidences that such innovation is needed
5. and propose a Lintner's (1965) certainty equivalent approach for credit scoring

Research Questions

Banks and firms ability to consider corporate risks in their strategy:

1. Is there a relationship between the risk/return profile of northern Italian SMEs and banks' financing decisions?

2. Is there a relationship between the profitability of northern Italian SMEs and balance sheet indicators capturing various risk measures (operational, financial and asset side risks)?

3. Is there a relationship between the profitability of northern Italian SMEs and balance sheet indicators capturing various risk measures (operational, financial and asset side risks), when these firms are classified as leading (LF), stand alone (SA) and suppliers (SF)?

Literature review

1. Basel regulation

   Dullman and Scheule (2003), Dietsche and Petey (2003), Blundell-Wignall and Atkinson (2010), Angelkort and Stuwe (2011), Cardone-Riportella et al. (2011), KPMG (2011), Schizas (2011, 2012), Kaserer (2012), Delimatsis (2012),

2. Credit ratings

   Beaver (1966), Altman (1968), Altman et al. (1977), Platt and Platt (1990), Hesselmann (1995), Baetge (1998), Weber et al. (1999), Brunner et al. (2000), Blochwitz and Eigermann (2000), Gunther and Gruning (2000), Frame et al. (2001),Masschelein (2003), Allen et al. (2004), Berger et al. (2005), Grunert et al. (2005), Cowan and Cowan (2006), Mantovani (2011, 2011)

3. Lintner's Confident Equivalent Methodology and evolutions

   Lintner (1965), Gardenal (2011)

4. SME's networks

   Coase (1937), Alchian and Demesetz (1972), Williamson (1975, 1981), Nacamulli (1985), Rugiadini (1985), Butler (1992), Porter and van der Linde (1995), Boot et al. (2000), Allen and Phillips (2000), Garzella (2000), Broglia Giuggi (2001), Jacobides and Billinger (2006), Cainelli and Iacobucci (2011), Mantovani and Daniotti (2012), Mestroni et al. (2013)

The Lintner-based Approach

We consider confident equivalent (CE): the return on investments (ROI) rate that a firm will sure produce with the 90% of confidence.

Starting from the CE estimation for groups of similar firms through E(ROI) and σ_{ROI}:

$$CE_s = E(ROI_s) - z * \sigma_{ROI,s}$$

$$E(ROI_s) = CE_s + z * \sigma_{ROI,s} = \beta_0 + \beta_j * X_j + \varepsilon$$

Moving to single firm's E(ROI) and average ROI comparison, we can produce a ranking of firms, measured as over performance capacity.

If $ROI_i > E(ROI_i)$ then $CE_i > CE_s$

Bank system allocation efficiency

Comparing average relation of E(ROI) and ROI to the amount of financial resources raised by firms (DEB/OPRE), we are able to determine the efficiency of bank system in resources allcoation.

Table 1: Cross section match between ROI-E(ROI) and DEB/OPRE classification.

		ROI-E(ROI)	
		POSITIVE	NEGATIVE
DEB/OPRE	HIGHER	**1.** Super performers that raise more financial resources than sample average	**2.** Low performers that raise more financial resources than sample average
	LOWER	**3.** Super performers that raise less financial resources than sample average	**4.** Low performers that raise less financial resources than sample average

Bank system price efficiency

Comparing average relation of E(ROI) and ROI to the interest rate (INTE/DEB), we are able to determine the efficiency of bank system in credit pricing.

Table 2: Cross section match between ROI-E(ROI) and DEB/OPRE classification.

		ROI-E(ROI)	
		POSITIVE	NEGATIVE
INTE/DEB	HIGHER	**1.** Super performers that pay less for their raised financial resources	**2.** Low performers that pay less for their raised financial resources
	LOWER	**3.** Super performers that pay more for their raised financial resources	**4.** Low performers that pay more for their raised financial resources

Sample

4.066 manufacturing firms located in the North East of Italy (Trentino Alto Adige, Veneto, Friuli Venezia Giulia), a region with an high presence of SMEs.

Firms are selected considering continuity in balance sheet data from 2006 to 2012, and for each year:

- Total assets ≥ 1.000 €;
- Operating Revenue ≥ 1.000 €;
- Fixed Assets ≥ 1.000 €;
- Shareholders' Funds ≥ 1.000 €;
- Cost of Employees ≥ 1.000 €;
- Firm with an unconsolidated account.

Indexes

4 typologies of risk for a total of 23 indexes:

- ***Technology features***
  - CA/FIAS (%) Currency rate of assets
  - CA/CL (%) Current equilibrium
  - WKCA/FIAS (%) Relative intensity of working capital
  - FIAS/OPRE (%) Absolute intensity of fixed assets
  - RLFA (--) Residual Life of Fixed Assets
- ***Financial strategy***
  - DEB/EBITDA (--) Years for debt re-financing
  - DEBLT (%) Long term debt rate
  - DEB/EQUITY (--) Relative rate of debtness
  - DEB/ORPE (--) Absolute rate of debtness
  - LEV (--) Financial leverage
  - INTE/DEB (%) Financial interest rate
- ***Operative risks***
  - WKCA/OPRE (%) Absolute intensity of working capital
  - DOL-volume (--) Degree of operative leverage on volume changes
  - DOL-price (--) Degree of op. lev. on price changes of x (x=1%)
  - DEB-CRED (dd) Difference between delays on payments to creditors and payments from debtors
- ***Rate of return***
  - ROI (%) Return on Investment
  - ROE (%) Return on Equity
  - ROS(%) Return on Sales
  - AV/STAF (%) Work productivity
  - EBIT/INT (--) Interest Coverage
  - FCFC/OPRE (%) Margin of Free Cash Flow Characteristic
  - FCFO/OPRE (%) Margin of Free Cash Flow Operative
  - TAX (%) Tax rate

New Firm Classification Method

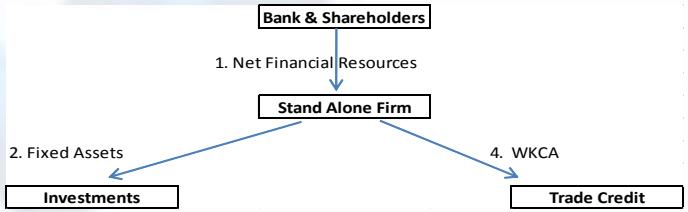
Firm's specific operational risk exposition:

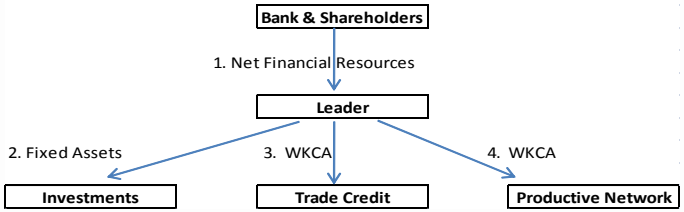
Table 3: Sub-samples based on operating leverage levels – definitions

		DOL-volume	
		High	Low
DOL-price	High	High-Risks	Price-Risk
	Low	Volume-Risk	Low-Risks

Firm's specific role in or out a productive network:

- Stand Alone firm (SA);
- Leader Firm(LF) that support its suppliers (productive network);
- Supplier Firm (SF) financed by the leaders.





Results - Debt and Investment Decisions

Debt availability is strong depending on the past debt level (Regression B) of a firm, and no important correlation is registered with today (Regression A) and past (Regression C) levels of risk variables.

Table 4: Panel Regression Adjusted R-squared for Absolute Indebtedness and Relative Indebtedness

	Dependent Variable	
	DEB/OPRE	DEB/EQUITY
Regression A - years 2007-2012	0.221203	0.050612
Regression B - years 2008-2012	0.831424	0.57834
Regression C - years 2008-2012	0.290982	0.079881

Also investment choices present a higher relation to past than to risk:

Table 5: Panel Regression Adjusted R-squared for Returns On Investments (ROI)

	Dependent Variable
	ROI
Regression A - years 2007-2012	0.10412
Regression B - years 2008-2012	0.154344
Regression C - years 2008-2012	0.138537

Results – Regressions' Precision

The sub samples produces an increasing in R-squared values for Regressions considered:

D) Analyze the relation between the level of ROI and the contemporary level of risks;

F) Analyze the relation between the variation on ROI level and the level of risks.

Table 6: Panel Regression Adjusted R-squared for Absolute Indebtedness and Relative Indebtedness

	Low-Risks	Volume-Risk	Price-Risk	High-Risks
Regression D	*0.155899*	*0.144582*	*0.098044*	*0.178782*
Regression F	*0.584104*	*0.546872*	*0.452113*	*0.53213*

Table 7: Panel Regression Adjusted R-squared for Returns On Investments (ROI)

	Total Manufacturing Sample	Stand Alone (SA)	Supplier Firms (SF)	Leader Firms (LF)
Regression D	*0.156253*	*0.693441*	*0.148303*	*0.605364*
Regression F	*0.511537*	*0.268789*	*0.51904*	*0.252065*

Results – Analyzing Confident Equivalent

Confident equivalent estimation gives the measure of the value of the investment in a specific set of firms, giving also the measure of which type of firm produces the investment's highest values.

Table 8: Certainty equivalent estimated using the highest R-squared regression for every sample and sub sample and considering a 10% confidence interval of a normal distributed variable (z=-1,282)

	Total Manufacturing Sample	Sub Samples						
		Low-Risk	Volume-Risk	Price-Risk	High-Risks	SA	LF	SF
E(ROI)	12.4%	16.6%	9.4%	14.7%	6.8%	5.7%	8.5%	15.8%
σ_{ROI}	41.2%	27.4%	45.1%	45.8%	38.4%	10.0%	11.6%	51.3%
CE	-40.4%	-18.6%	-48.5%	-44.1%	-42.4%	-7.1%	-6.3%	-49.9%

Results – Bank System Efficiency

Confident equivalent estimation gives the measure of the value of the investment in a specific set of firms, giving also the measure of which type of firm produces the investment's highest values.

Table 9: Cross section match between average ROI-E(ROI) ranking and DEB/OPRE levels.

		ROI-E(ROI)	
		POSITIVE	NEGATIVE
DEB/OPRE	HIGHER	25.8%	20.7%
	LOWER	26.2%	27.4%

Table 10: Cross section match between ROI-E(ROI) ranking and INTE/DEB levels.

		ROI-E(ROI)	
		POSITIVE	NEGATIVE
INTE/DEB	LOWER	32.3%	31.6%
	HIGHER	19.6%	16.5%