

The Competence Value

why entrepreneurial finance is useful to estimate the financial value of human capital

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HERMES Entrepreneurial Thinkpad

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Foreword



Milan, 1950 – Agordo (BL) 1958

At that time, could you estimate the 2014's value of this guy?

2014's stock exchange evidence

P/BV = **4.20** (= 1-hardware + **3.20**-software)

Beta = 1.30

50 years flash-back P/BV = **1.1028** (=1+0.1028)

My worry: could we estimate it even in an ex-ante approach?

This should have
been your result...

Agordo (BL), Milan & New York City, 2014
20bn Euros, according to 2014's av. price



Foreword (cont'd)

- In 2004, I published "*Competence Value e merito finanziario delle imprese*" in *Argomenti*: 12 89-116
- In 2014, I'm now publishing "*Competence value emersion: a key to sound practices in entrepreneurial finance. From 'Q' to 'T' ratios in the North-Eastern Italian experience*" in *Int'l Journal of Entrepreneurship and Small Business* <http://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=IJESB>, (Editor: Marie H. Broianne, EM Strasbourg)
- These 10 years of research experience convinced me that **Entrepreneurial Finance is to be understood as the Corporate Finance in incomplete financial markets**, since it contributes to achieve solution for puzzles as
 - Market based vs. Banking based CF approaches (Allen, 2014)
 - EF as (ante-litteram) perspective theory (Yazdipour, 2011)
 - Valuation of unlisted companies (Guatri-Bini, 2005)
- **My aim here is trying to convince you all too while depicting the developments prospects of this approach.**



Agenda

1. Prologue: the roots of competence value
2. Valuing skills in a slavery-free world?
3. Riding the Financial cycles of Entr'I value
4. From Q-Ratio to T-Ratio: measure it!
5. The empirical evidence
6. Epilogue: looking forward



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38,60 $\uparrow 0,26$ (0.67%) 24 ott 17:25

Azienda o codice

Cerca grafico

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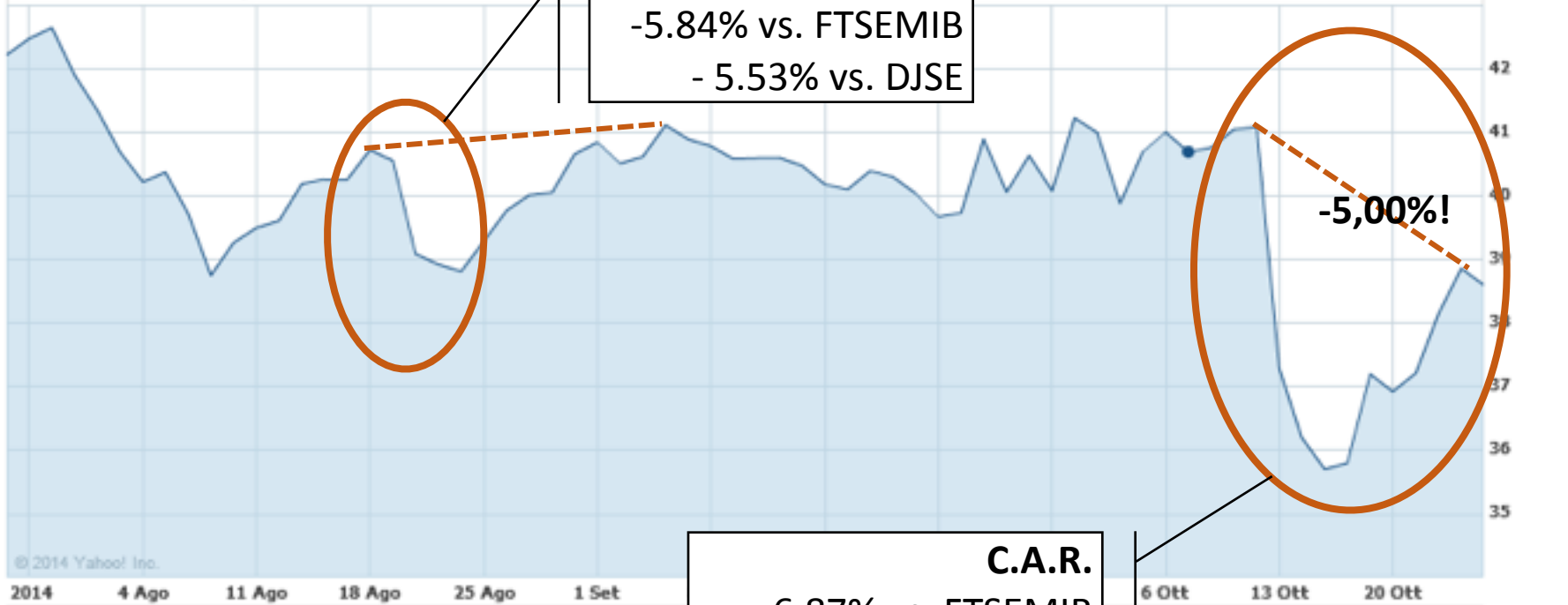
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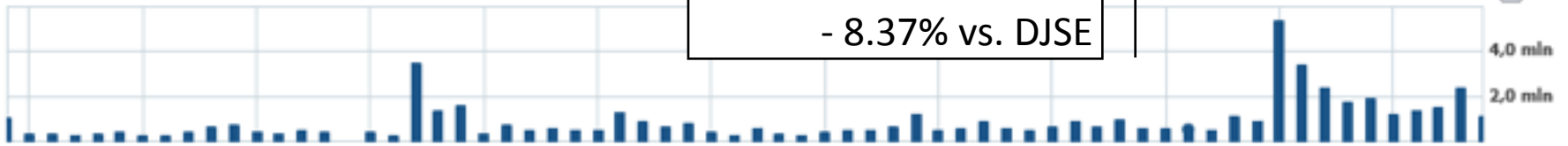
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Volumi: 563.200



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the roots of competence value

- **Intangible assets diverts from competence value**
 - Time horizon is given ex-ante => intangible assets
 - Time horizon is undefined => competence value
 - ! In finance, time is a measurement instrument
- Keyword: **resilience**
- **Can you transform skills into a corporate hallmark?**
 - Intangibles driven market prices
 - Myers, Majluf (1984) approach applies
 - Intangible assets suffer from volatility since their productivity is to be deployed, given the time horizon
 - Competence driven values
 - Options to revamp corporate value applies
 - Competence value contributes to stability if the entrepreneur raise new options and wisely exercise them
- Keywords: **skills pullulating & value emersion**



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The Copeland, Weston (1988) paradox

PROVOCATIO (page 272, Italian edition 1994)

- CAPM/APT supposes any market to be frictionless...
- CAPM/APT supposes any investment to be splittable...
- CAPM/APT supposes any investment to be tradable...
- **...CAPM/APT supposes slavery** for "human capital"!

CAVEAT (pages 130-135, Italian edition 1994)

- Does this scientific-splash source in the Mean/Variance tool? **NO!**
- The problem roots is a lazy (i.e. out of reality) use of stochastic dominance embedded by the math-ers into financial modeling
- In fact, by recurring to 2nd species S.D. you jump-over the utility/risk aversion puzzle. This simplifies M/V but admits slavery!
- By adopting a (more reality-linked) **1st species of S.D. you obtain scientifically sound results, anyway, even in M/V modelling**
 - Cfr: Friedman-Savage (1948) – Arrow (1963) – Lintner (1965)



Why human skills may be valuable (even after the abolition of slavery)

- The inner theoretical background:
 - Think about skills as a productive factor contributing to business economics (**Baumol, 1968**)
 - in entrepreneurial business, skills productivity is joined to that of other assets (**Baumol, 1993**)
 - know-how can be easily spread through learning experiences than through market transactions (**Rullani, 2004**)
- My evolving ideas:
 - (**2004**) competence value is based on its convertibility from an individual feature to a firm hallmark.
 - (**2007**) this triggers a process of (intangible) corporate wealth capitalization.
 - (**2010**) the firm is to be understood as "nexus of risks" managed in order to capitalize such a value.
 - (**2013**) this process is based on the true behaviour of the Entrepreneur and the investor's risk aversion



These ideas require concepts about...

- **Time consumption** (the undefined time-horizons...)
 - In fact, when Entrepreneurs sell in advance their own company shares, they actually transfer the capital-only component of their legal title, while skills remain anyway their own property
- **Getting over** the risk aversion irrelevance for equilibrium as the in **two-funds separation theorem**
 - Sound corporate behavioral finance research confirms that overconfidence is a typical status of the Entrepreneurs (Busenitz, 1999; Cooper et al., 1988) and their funders (Malmendier and Tate, 2005, 2008; Ben-David et al., 2007; Hiller and Hambrick, 2005)
- **Entrepreneurial firms to be intended as nexus of risks**
 - (J. Stuart Mill, 1848) the key difference between management and entrepreneurship is the conscious bearing of risks => i.e. risk endogeneity (vs. exogeneity of financial modelling)



Yes, you can... it's competence value

- (Hisrich and Kearney, 2012, page 15) *“management is the transformation of inputs into outputs through conceptual, human and technical skills”* while *“an entrepreneur is future oriented, seeking opportunities and identifying innovations to fill opportunities”*
- Accordingly, **you're not pricing slaves to be sold. You're valuing the competitive use of knowledge** made by humans
 - i.e. you are assessing their contribution to sustainable wealth
- Since Arrow (1963) & Debreu (1959), the sound theoretical background for this puzzle is the state preference theory
 - SPT explains why the share prices can divert from (be lower than) their value in case of the Entrepreneur's permanence in the firm
- **You can solve the paradox by getting aware that**
 - **This is simply a market incompleteness puzzle (Allen-Gale, 1994)**
 - **That can be solved through a wise use of M/V models (Ross, 2002)**



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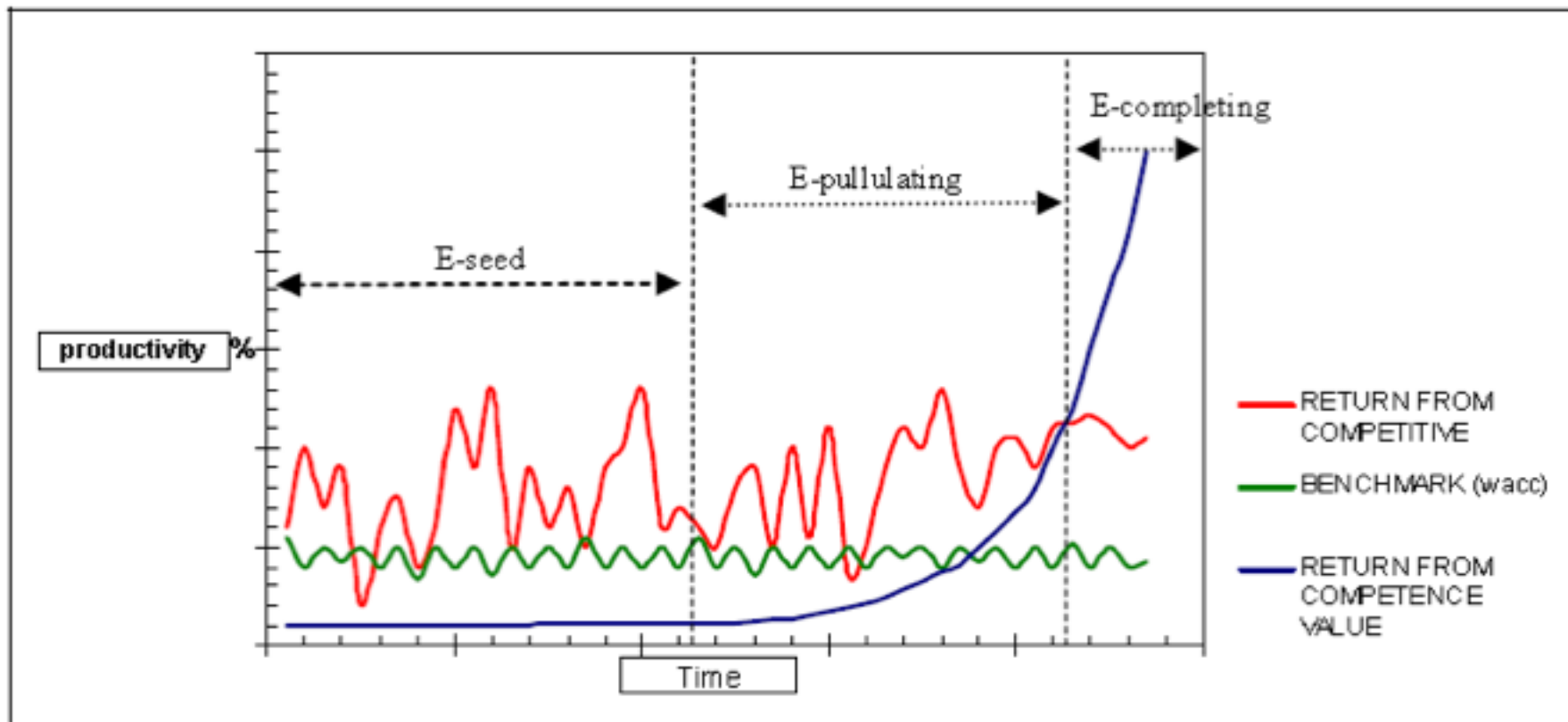
A 3-stage cycle of the Entrepreneurial Value

1. The (competence) value creation is based on skills: no skills means no competence value, for sure. **The first step is to transform knowledge (know-why) into skills (know-how)**
 - However, such skills do not mean market value. In fact, market valuation process (i.e. price) supposes the capability to separate the marginal contribution to productivity of any possible productive input.
2. A further theoretical concept is then required in our model to complete the skills-to-value connection: the **value-emersion**, i.e. the evolution of untradeable (i.e. very person-connected) potential value into the market price of the business (i.e. very capital-connected).
 - Such a connection requires an active entrepreneurial behaviour to spread knowledge into the firm and a financial support to hold up the processing of cycles. **This pullulates value inside the hierarchy**
3. Finally, information asymmetries and agency problems are to be solved in order to put the value on the market (e.g. through an IPO). The value cycle gets **complete**



Return-to-risk profiles are very specific into the three stages

Figure 1 The dynamics of observable business productivity



Source: Mantovani (2014), <http://www.inderscience.com/info/ingeneral/forthcoming.php?jcode= IJESB>

Setting a measurement methodology means...

- To refer to the three stages as a whole, i.e. the **persistency** of the entrepreneurial contribution must be measured, being the common root;
- To **identify the marginal productivity** of the inputs (including skills) while skills and capital are jointed productive factors (drivers) of the entrepreneurial business;
- To avoid considering time as a simple element to compute present value since **time is the required input** to be consumed into the learning cycle of the organization to separate them;
- massive agency problems may arise during the process of skill spread and value emersion, increasing the risk of the investment in the Entrepreneurial challenge. **Risk aversions adaption** to the contingent stage of the cycle must be considered;
- risk aversions can be biased by misperception and information risk while can be forced to divert from normal levels according to the peculiarities of the Entrepreneurial Business. Pure titles do no exists, we are in an **incomplete financial markets framework**.



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Avoid the 2nd species S.D. bias

- the risk premia determination is one of the inner puzzle in valuing private companies
 - Main methodological solution: peer groups
- in entrepr'l valuation you don't have benchmarks to refer to
 - Moreover risk aversions may be biased
- Linter's idea (1965)
 - Manipulate flows (certainty equivalent) instead of discounting rates
 - you will get to the same market equilibrium
- Leibowitz' idea (1994)
 - When utility curves are convex, a confidence shortfall approach in investing...gets you to the same choice as in market equilibrium
- My idea: estimating "shortfall equivalent" may be easier and more affordable than estimating the risk premium...
 - In AEF-LA 2011 I discussed this with Prof. Melnik (Haifa University). He told me that this seems to be consistent with Friedman&Savage, 1948...
 - In WFC-Cyprus 2013, Prof. Schwartz (Emeritus at UCLA) suggested me to adopt an option-based approach to control the competence value
 - In Strasbourg 2014, I found an editor convinced about (Prof. Broihanne)



The market (in)completeness case

The neo-classical model with no growth

$$P = \frac{E(CF)}{k} = BV \frac{r}{k}$$

$$\frac{P}{BV} = \frac{E(CF)}{BV k} = \frac{BV r}{BV k} = \frac{r}{k}$$

In **incomplete markets** $P \leq W_1$ (Allen-Gale, 1994)

(if $P < W_1$ markets are also inefficient)

Markets are complete if $P = W_1 + W_2$ i.e.

The (enhanced) competence value

(Embedding Melnik, 2011 and Schwartz, 2013 suggestions)

$$W = W_1 + W_2$$

$$W_1 = \frac{[E(CF) - E(X)]}{k} = BV \frac{r-x}{k}$$

$$W_2 = \frac{p}{(1+k)^t} \frac{E(X) + E(C)}{k}$$

$$\frac{P}{BV} \rightarrow \frac{W_1}{BV} = \frac{[E(CF) - E(X)]}{BV k} = \frac{r-x}{k}$$

$$\frac{W_2}{BV} = \frac{\left[\frac{p(x+c)}{(1+k)^t} \right]}{k}$$

$$\frac{p}{(1+k)^t} = x \left[1 - \frac{p}{(1+k)^t} \right]$$



The Lintner (1965)'s suggestion

$$\frac{E(CF)}{k} = P = \frac{CE}{R_f}$$

$$\frac{r}{k} = \frac{P}{BV} = \frac{r^*}{R_f}$$

r^* the book return rate based on CE (=CE/BV)

$$\frac{W_1 + W_2}{BV} = \frac{(r - x) + \left[\frac{p}{(1+k)^t} (x + c) \right]}{k} = \frac{r^*}{R_f}$$

A shortfall version based on Leibowitz (1995)

$$r^* = i - SHF + N(\phi)\sigma_i$$

$$k^* = m - SHF + N(\phi)\sigma_m$$

The joint distribution of “ r ”, “ x ” and “ c ” is then used to determine r^* , given a confidence level to be estimated according to the two basics of Entrepreneurial Business Success: “ p ” and “ t ”

In equilibrium $r^*=k^*$. In fact, according to the Lintner’s hypothesis,

$$m - SHF = i - SHF \quad \forall i; \forall \phi$$



Moving from Q-Ratio to T-Ratio

$$Q = \frac{W_1}{BV} = \frac{r-x}{k} = \frac{r_i}{k}$$

$$T = \frac{W_2}{BV} = \frac{\frac{p}{(1+k)^t} (x+c) r^*}{k}$$

According to Lintner

$$\frac{W_1 + W_2}{BV} = \frac{(r-x) + \left[\frac{p}{(1+k)^t} (x+c) \right]}{k} = \frac{r^*}{R_f}$$

The Intato's estimator

$$T^{\wedge} = \frac{r^*}{R_f} - \frac{r_i}{k}$$



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An empirical test

3,046 companies in the Treviso District

Source:
Mantovani (2011, UCLA), Mantovani (2014, forthcoming IJESB)

Industry (translation of the original Italian name)	ATECO Code	SIC Code	# of corporations	Beta	100% of capital	average ROI	median ROI	standard deviation of ROI
Agriculture and hunting services, forestry	01, 02	0	69					
Food and Drink	10, 11, 12	20	100	0,65	13,14	23,32%	22,56%	9,81%
Manufacture of leather goods made of wood, cork, straw	15	26	24	0,50	14,4	23,37%	22,21%	9,13%
Manufacture of clothing, dyeing, tanning fur	17	26	24	1,60	15	16,20%	23,22%	13,63%
Manufacture of footwear	18	26	24	1,53	17	13,86%	22,01%	16,70%
Manufacture of textiles	19	26	24	1,56	17	15,91%	23,82%	11,78%
Manufacture of paper and printing	26	26	24	1,17	18,58	12,40%	23,83%	10,59%
Manufacture of rubber and plastic products	28	28	24	1,02	20,21	11,05%	26,70%	7,84%
Manufacture of glass and artificial synthetic fibers and	29	28	24	1,01	18	10,96%	10,00%	10,79%
Publishing, printing and reproduction of recorded media	27	27	24	0,57	23	7,80%	12,97%	11,20%
Manufacture of chemicals and allied chemical products	28	28	24	0,97	24,25	10,00%	16,67%	11,57%
Manufacture of metal products	33	33	24	1,28	14	13,99%	6,88%	9,68%
Manufacture of machinery and equipment	35	35	24	0,96	26	10,51%	35,73%	10,98%
Metalurgy - Manufacture of processing of metal products and	33	33	24	0,96	26	10,51%	35,73%	10,98%
Manufacture of electrical appliances, etc.	36	36	24	0,91	27	20,36%	36,1	13,21%
Manufacture of machinery and equipment nec	37	37	24	0,89	28	27,5	33,12	16,80%
Manufacture of electrical appliances, etc.	38	38	24	1,26	29	30,9	9,88%	28,35%
Manufacture of machinery and equipment	35	35	24	0,77	31	13,21%	29,43%	11,73%
Manufacture of mechanical, forest and semitrailers	37	37	24	1,24	32	8,80%	38,31%	9,42%
Manufacture of other transport equipment	38	38	24	1,13	41,42	48,09%	15,16,23%	11,98%
Manufacture of building societies	41	41	24	0,76	45	11,86%	59,33%	11,04%
Other manufacturing, maintenance and repair of motor vehicles and	42	42	24	0,59	46	8,71%	8,94%	9,29%
Building societies	43	43	24	0,81	47	7,38%	7,13%	10,42%
Trade, maintenance and repair of motor vehicles and motorcycles	48	48	24	0,92	48	9,36%	53,54	11,78%
Commerce wholesale and commission trade, motor vehicles and motorcycles	51	51	24	0,72	49	8,35%	7,63%	13,09%
Retail (excluding motor vehicles and motorcycles) repair of personal and household goods	52	52	24	0,92	49	10,16%	6,40%	11,58%
Retail (excluding motor vehicles and motorcycles) repair of personal and household goods Land Transportation, pipeline transport, storage and information services	53	53	24	1,62	55	5,6	7,0	2,7
Computer and related activities	73	73	24	0,96	62	63,95	11	63
Hotels and restaurants	55	55	24	0,96	68	16,45%	6,40%	19,90%
Computer and related activities	73	73	24	0,74	69	70,71	26,34%	12,53%
Real Estate	65	65	24	0,92	90	92,92	59,1	9,48%
Recreational Cultural and Sports	79	79	24	1,10	90	11,77%	4,00%	18,57%
Recreational Cultural and Sports	79	79	24	1,10	90	11,77%	4,00%	18,04%
Treviso District total			3046	1,00	99,87%	8,46%	7,58%	12,16%



Inside the black-box

1. The cost of capital (k) of TV-companies is fixed at

$$K = 1.87\% + (9.00\%) \times 1 = 10.87\%$$

Being: 1.87% is the risk-free rate (benchmark Italian Treasury Bond, BTP) at the time of estimation (February 2011)

2. Long term estimation of the Italian stock market indicates 18% as the standard deviation of price return on a yearly base. We fixed a confidence level at 10% which means risk tolerance higher than the one underlying value-at-risk Basel standards (confidence level at 1%), but it is consistent with average relative risk aversion (4.00 - 6.00 according to Bodie, Kane, Markus, 2014) and the correction required for illiquid Italian SMEs.

- In any event, you must remember that this choice should not have an impact over average results affordability according to 1st degree stochastic dominance approach (Lintner and Friedman&Savage).

3. We can compute the market shortfall level for the equity risk premium at 10% confidence as to determine a market maximum tolerated loss, m-SHF:

$$m-SHF = 1.87\% + (9.00\% - 1.28 \times 18.00\%) \times 1 = -12.21\%$$

Inside the black-box (cont'd-#1)

1. the average operating book return for TV-companies (r^*) is 8,45%, while its standard deviation of the distribution is 12.16%.
2. A correction of the standard deviation has to be made according to the skewness of the distribution, mainly due to different expected growth ratio of the corporation. The corrected figure is 20.66%.

$$k^* = -12.21\% + 1.28 \times 20.66\% = 14.28\%$$

3. Given the m-SHF level and the equilibrium overlap with the i-SHF the threshold rate of return (k^*) for competence value estimation is found
4. The same computation can be repeated for any industry in order to identify specific k^* levels. This being the case, the persistency of returns (i.e. competence value) is supposed.

$$k^* \leq r^* = (r - g) + \frac{(r - g) - (r - g)}{(1 + g)}$$



The Treviso's District case

Tobin-Q-Ratio vs. Intato-T-ratio in different industries

Industry (translation of the original italian name)	Q-Ratio	T-Ratio
Agriculture and hunting services, forestry	0,4382	1,3566
Food and Drink	1,2410	1,2299
Manufacture of textiles	0,4131	1,1274
Manufacture of clothing, dyeing, tanning fur	0,8605	1,3579
Manufacture of leather goods made of wood, cork, straw	0,5577	1,2288
Manufacture of wood, cork, straw	0,5346	1,0293
Manufacture of paper and paper products	0,6065	0,9537
Publishing, printing and reproduction of recorded media	0,9120	1,1209
Manufacture of chemicals and artificial synthetic fibers and	1,5666	1,3534
Manufacture of rubber and plastic products	0,8177	1,2594
Manufacture of other non-metallic mineral processing	0,5123	1,3472
Metallurgy - Manufacture and processing of metal products except machinery and equipment	0,9777	1,2198
Manufacture of computers and electronic and optical products, electrical appliances, etc.	0,6858	1,0578
Manufacture of electrical and non-electric domestic appliances	0,8497	0,9332
Manufacture of machinery and equipment nec	0,7140	1,2818
Manufacture of motor vehicles, trailers and semitrailers	0,9439	1,2593
Manufacture of other transport equipment	0,4026	0,8536
Manufacture of furniture	0,7867	1,2205
Other manufacturing	1,0267	1,3729
Building societies	0,9928	1,2014
Trade, maintenance and repair of motor vehicles and motorcycles	1,0295	1,3755
Commerce wholesale and commission trade, motor vehicles and motorcycles	0,9132	1,2593
Retail (excluding motor vehicles and motorcycles), repair of personal and household goods Land Transportation, pipeline transport, storage and auxiliary transport activities	0,6306	0,8767
Hotels and restaurants activities	0,2677	1,2891
Computer and related activities	1,5651	1,4825
Real Estate	0,6301	1,4380
Professional services	1,2434	1,5666
Recreational Cultural and Sports	0,3390	n.a.
Treviso's District as a total	0,7773	1,2818

Low evidence supports funding in short term:
 $Q=0,7773 < 1$

Strong evidence supports investing in Entrepreneurship:
 $Exp(ret)=T/Q=65%$



Inside the black-box (cont'd-#2)

four qualities of corporate performance:

1. **competitive-companies** with high returns $(r-x(=0)>k)$ but without long term skill tillage that might affect the persistence of the corporate performance $(r^*<k^*)$;
2. **competence-based-enterprises** with high competence value $(r^*>k^*)$ but poor short term performance (i.e. $[r-x]<k$);
3. **vulnerable-firms** which destroy value $(r<k)$ but have positive returns, higher than the cost of debt capital only $(r>i>0)$;
4. **excellent-firms** with contribution to the positive gap between mean and median data of the sample because have both goodwill and competence $(r>k + r^*>k^*)$



The Treviso's District case:

Competitive vs. "competent" corporation distribution

Industry (translation of the original italian name)	frequency of Q>1 firms	frequency of T>1 firms
Agriculture and hunting services, forestry	32,92%	19,72%
Food and Drink	56,68%	18,04%
Manufacture of textiles	24,16%	36,26%
Manufacture of clothing, dyeing, tanning fur	45,40%	36,51%
Manufacture of leather goods made of wood, cork, straw	27,51%	56,23%
Manufacture of wood, cork, straw	28,93%	31,57%
Manufacture of paper and paper products	28,97%	42,88%
Publishing, printing and reproduction of recorded media	46,43%	37,05%
Manufacture of chemicals and artificial synthetic fibers and	63,84%	25,93%
Manufacture of rubber and plastic products	43,37%	32,67%
Manufacture of other non-metallic mineral processing	24,96%	57,58%
Metallurgy - Manufacture and processing of metal products except machinery and equipment	49,14%	39,23%
Manufacture of computers and electronic and optical products, electrical appliances, etc.	37,26%	30,06%
Manufacture of electrical and non-electric domestic appliances	46,48%	6,98%
Manufacture of machinery and equipment nec	37,35%	48,55%
Manufacture of motor vehicles, trailers and semitrailers	47,91%	34,61%
Manufacture of other transport equipment	25,79%	15,43%
Manufacture of furniture	40,94%	42,87%
Other manufacturing	51,00%	43,43%
Building societies	49,80%	14,13%
Trade, maintenance and repair of motor vehicles and motorcycles	50,92%	32,06%
Commerce wholesale and commission trade, motor vehicles and motorcycles	47,79%	13,98%
Retail (excluding motor vehicles and motorcycles), repair of personal and household goods Land Transportation, pipeline transport, storage and auxiliary transport activities	37,30%	12,04%
Hotels and restaurants activities	27,25%	29,47%
Computer and related activities	62,53%	32,91%
Real Estate	36,98%	33,04%
Professional services	55,29%	30,41%
Recreational,Cultural and Sports	33,33%	n.a.
Treviso's District as a total	42,11%	31,58%

Missing joint status

42.11% competitiveness (Q=1.6049)
do NOT overlap to 31.58%
(T=1.2828 – 13years' Q=8.8990)
only 9.56% are both!

Lack of selectivity

32.55% (=42.11-9.56)
are competitive now but do not seem to have long term opportunity
22.02% (=31.58-9.56)
Are competence based without having enough short term results
20.44% (estimate)
Are the TV's financially vulnerable firms having operating profits below interests paid to banks



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Epilogue: what's next?

Source: Mantovani (2012, NYU-Poli), Mantovani (2015 forthcoming, Palgrave-MacMillan, New York)

Dependent Variable: PFN_E_M

Method: Least Squares

Sample: 1 580

Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CCC_F_M	0.421543	0.225652	1.868115	0.0623
GLO_M	0.000131	0.000468	0.279617	0.7799
GLP_M	0.117500	0.024176	4.860227	0.0000
QS	-0.437341	0.169977	-2.572946	0.0104
TS	-8.73E-12	3.38E-12	-2.580908	0.0101
C	1.215396	0.254624	4.773297	0.0000
R-squared	0.061777	Mean dependent var		1.641909
Adjusted R-squared	0.053058	S.D. dependent var		3.420451
S.E. of regression	3.328474	Akaike info criterion		5.253873
Sum squared resid	5960.362	Schwarz criterion		5.301288
Log likelihood	-1423.054	Hannan-Quinn criter.		5.272411
F-statistic	7.084910	Durbin-Watson stat		1.969759
Prob(F-statistic)	0.000002			

In a 2nd species S.D. M/V based world, (e.g. Basel-X agr.) asset backed/liquidity finance exists, only, thus aborting (long term) business sustainability

The next challenge
ENTREPRENEURIAL FINANCE

is then to switch
from ASSET-BACKED
corporate finance concepts to
COMPETENCE-DRIVEN

That's where my
next efforts will
move toward

Projects now on the go, where I'm contributing to

CCIAA-Treviso & EC Bruxelles

HERMES-Unis, Strasbourg & Tulane Uni, New Orleans

AoBFE, Los Angeles & FMA, Tampa

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