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THE FINANCIAL VALUE OF ENTREPRENEURSHIP

Using Applied Research to Quantify Entrepreneurial Competence

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ISBN 978-1-137-39149-0 ISBN 978-1-137-36537-8 (eBook)
DOI 10.1057/978-1-137-36537-8

Library of Congress Control Number: 2017940475

Cover image: Détail de la Tour Eiffel © nemesis2207/Fotolia.co.uk

Printed on acid-free paper

This Palgrave Macmillan imprint is published by Springer Nature
The registered company is Nature America Inc.
The registered company address is: 1 New York Plaza, New York, NY 10004, U.S.A.

In Memory of Teofilo Intato (unknown, 1869 – Stabie di Lentiai, Italy 1930), " . . . *because* Hope and Thinking survive humans and let them live forever"

Foreword

The Teofilo Intato's Tale and the Competence Value Concept

"*Pianta'l noghèr*" (*plant the walnut*). This phrase is widely used in the pre-Dolomitic lands on the left-side of Piave, the Sacred Italian River . . . and it is indeed at the root of the competence value concept described in this book. In fact, the farmers now planting the walnut are not expecting to eat its fruits; only her or his daughter/sons and nieces/nephews can do that. Thus, which is the economic rationale of planting it, if any? The tale of Teofilo Intato gives us an answer, by explaining that the pitch has value today . . . even if standard economics (or common sense) are unable to recognize it!

In the times in which we are living, in this dark sparkly dimension of "hic et nunc" (here and now), it is almost as if we lose the need for a future, we lose the need for such a pressing motivation that let humans perceive what they would never see in their lifetime and let them push to act according to such a vision. This book marks an inversion in the trend; it offers a modern but ancient look at that train of thought, at that thirst, at that hunger, at that fever that feeds progress. Even more, it does this in finance, a typical area of short-termism and speculation.

The original methodology to estimate the competence value that you may read in this book is based on an original rearrangement of two of the most intriguing financial models: Lintner's model (1965), to estimate value by recurring to certainty equivalents, and Fisher Black's Zero-Beta model (1972) to price risk without the risk-free benchmark and support. The key innovation proposed by the author is the new concept of time, here intended as a gateway to transforming human knowledge into a

productive factor, no longer to be seen as a purely financial constraint. Still on this topic, Teofilo's experience inspired the model suggesting that the time horizon to refer to estimate the value (of the walnut today) cannot be limited by the human life constraint (or by any other market constraint acting on the time view). Therefore, the efficiency of the pitch choice roots into wisdom, that is, into the view of forthcoming needs (even the unperceived ones, nowadays). The T ratio (what other name was possible?) is the final multiplier you obtain to compute the competence value. It is of inner practical use because it can be competitively used with the widely used Tobin's Q ratio, particularly in the case of unlisted companies. This is why the competence value concept and the T ratio are becoming more and more of a benchmark in entrepreneurial finance practice.

Finally, Teofilo's human story is striking out that to let such a value emerge, you must have the entrepreneurial bravery to challenge the future. The research experience supporting this book is itself an evidence of entrepreneurship. Emerging in 2004 from the small village of Stabie di Lentiai at the bottom of the Dolomites, indeed, Teofilo's village, it strongly pullulates firstly in Treviso, then to a global scale as this book confirms. Guido and his team were stubborn enough to continue the research even when they met serious straits. But this is normal; the true entrepreneur is to be so, having apparently utopist views to pushing vs. events, particularly when it is very difficult to share them with the other, non-dreaming, people. Now that the process gets to a complete stage that make it difficult to revert, we (being with him from the very beginning) can say that Guido imitates Teofilo. They both are interpreters and witnesses to the belief that always puts humans at the center . . . because tomorrow will be better than today only if we accept the guidance of dedication and generosity of the entrepreneurial gospel for initiative and the foresight to "plant a walnut". This way, the time going by is no more a financial constraint but an investment opportunity you can assess in this book. Indeed, the greater legacy given to us by Teofilo Intato.

Agostino Tres & Pierluigi Svaluto-Moreolo, Lentiai, Belluno (Italy)

Acknowledgments and remarks added by the author to the Foreword

After reading the foreword, I felt the need to add a few lines in response to those generous words. In fact, good sentiments alone are not enough for an entrepreneurial challenge, as this book explains. Further commitments are required to complete the entrepreneurial cycle: capital funding, managerial pushing, market views and, chiefly, friendship. This is also true for the research program carried out at Teofilo Intato Foundation since 2004. Therefore, let me add my thanks to the SICRA-Group, which strongly supported the project by contributing generously to the charity during these years. Thank you to the Ca' Foscari University, particularly the folks at Campus Treviso (including its students and their very entrepreneurial brotherhood PiGreco-T), and especially, Past Rector, Professor Carlo Carraro, who gave me an unprecedented push. My thanks also to the local Chamber of Commerce and the H.E.R.M.E.S. Universities in Strasbourg, chiefly Professor Hans Tuemmers, who participated at the start-up presentation of the venture in the Garda Lake and gave it an international perspective. Last but not least, special thanks to staff at Palgrave MacMillan, having seen the opportunity for this book since the Academy of Entrepreneurial Finance Conference 2012 in New York City, and having the patience to wait until the World Finance Conference 2016 (New York), for the final manuscript submission.

Finally, very special thanks are due to that closer circle of a few friends who silently supported my dream from the very beginning: my wife Betty, Fabrizio, Agostino, Marilena, Silvano, Pierluigi, Bepi, Marta, Luigia,

Stefano, Giorgio, Giancarlo, Hans, Ludwig, Rachel, Antonello, Antonella, Milena, and Erica. Even though some of them declare themselves poor in of economics and finance (with the exception of Professor Bertinetti), they caught this was good and daily feed the project with their warm enthusiasm for the project and daily encouragement kept me going. Thanks to you all, guys, the spirit of the "Intact" foundling Teofilo is still alive, more than 85 years after his death, and spreads globally. This mood is fantastic because it is the dream committed by the last direct Teofilo's pro-nephew before death in year 2000: my mom!

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CHAPTER 1

The Root: Why Competence has Value

Abstract Financial markets may set the price for assets, but an enduring economic performance is generated from having the right skills. Although everybody agrees on the existence of the value of human capabilities, financial practice troubles to detect it in full. The question this book tries to solve is: How can you use the tools of financial evaluation to side your intuition when investing in entrepreneurial business and competence growth? The solution proposed is based on the concept of human skills as a productive factor, contributing to business economics. In the case of Entrepreneurial Businesses, skills contribution to corporate performance is a key driver but pullulates from the entrepreneur so that her/his productivity is strongly joined to that of the capital employed into the company.

Keywords Skills as a productive factor · Competence value · Skill accumulation process · Entrepreneurial life-cycle · Endogenous risk · Goodwill vs. Competence-value

The basic idea presented in this book is that skills should be considered productive factors that contribute to business economics. This book tries to answer the following question: How can the tools of financial evaluation be used to guide intuition when investing in entrepreneurial business and competence growth? The valuation methodology proposed here tries to address the shorttermism of widely used methodologies by extending

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_1

them to account for the drivers of skill productivity. By determining the value of human competence, more insight can be gained into the drivers of competence productivity and its contribution to entrepreneurial success.

Since 1968, when Baumol first proposed the concept, the idea that intangibles are protagonists in economics and management has become increasingly popular. In fact, as business models have evolved, they have decreased the hardware requirements and increased the software requirements for business success around the world. Accordingly, the modern firm is a nexus of tangible and intangible assets, including skills, knowledge, managerial capability, and forecasting future needs, whereas corporate risk is the glue of the successful nexus. Tangible assets are easier to detect and valuate, although intangible assets can generate strong asymmetry, as several financial scandals have demonstrated. Intangible-intensive firms are usually characterized by pass/fail distributions of business performance (either too strong or too weak) that make it increasingly difficult for external investors to form expectations. This information asymmetry can lead to the extreme illiquidity of these investments and to difficulty raising both debt and equity capital, which severely limit corporate growth. Similarly, wider adoption of corporate regulation systems based on historical performance and benchmark investments can tighten the financial constraints for intangible investment, as the recent discussions on the Basel agreements demonstrate.

The existence (and value) of many intangibles stems from the special mix of mind, knowledge and inspiration commonly known as human capital, the most tangible intangible concept contributing to the success of any business, at least at this time. Its roots in human nature explain why intangibles are very complex and delicate assets that must be successfully engaged and managed. Their return-to-risk profile is not connected to the mechanics usually embedded in tangibility. The length of time is highly unpredictable. Their allocation is based on relationships rather than on standard economic transactions. This is why it is so difficult to estimate the financial value of any intangible asset (most of all, human capital) let alone to invest money in them. Money invested in intangibles appears sunk; therefore, the most commonly proposed solution for investing in human capital and competence is equity.

In the case of entrepreneurial businesses, skills' contribution to corporate performance may become determinant. In fact, for these special businesses, skills are typically supplied by the entrepreneur such that her/his productivity is strongly connected to the capital employed in the

company (Baumol 1993). The entrepreneur is commonly a very influential equity owner (a major, if not the majority, owner). Particularly in the case of small and medium enterprises (SMEs), she/he truly controls business performance. The entrepreneur's efforts and her/his enthusiasm are critical to business success and to fueling the productivity of the tangible assets used by the firm. Thus, the specific combination of capital and skills in an entrepreneurial business requires both careful management of agency conflicts and a strong grasp of the legal aspects of the firm's life (Ruhul Amin Salim 2005), as indicated by the many legal solutions adopted in venture capital and private equity transactions. In corporate (or even social, public or university) entrepreneurship (Hisrich and Kearney 2012), specific contracts are used to resolve conflicts related to the contribution of skills to business success, usually through a unique mix of hierarchy and agency solutions.

The value of human skills remains potential without a connection to tangible assets. Moreover, its connection to human nature makes it difficult to trade separately from capital "at least since slavery has been abolished" (Copeland and Weston 1988). The impossibility of unbundling skills from capital makes investing in intangibles risky, keeping financial markets incomplete and conflicting with finance theory (Allen and Gale 1994). When financial markets are incomplete, only bundles (i.e., skills +capital) can be traded, since no prices are available for the individual components: skilled assets are worth more than unskilled ones, but the value of competence alone cannot be isolated. Achieving market completeness is challenging: the entrepreneur must embed her/his competence into the firm's structure to complete the market. This process does not require (equity) capital per se, since standard economic transactions do not properly describe skill diffusion. This process chiefly requires time, while liquidity needs are complementary only. Entrepreneurial businesses pass-through the potential value of any intangible to the final financially recognized price.

You can conclude that (a) competence always has (potential) value even if it does not yet have a (market) price but that (b) competence will never have a market price if no one will trust (please note that this is not a mistake: it is written "trust", not "invest") in its sprout or "pullulating" (as it will be preferred in this book). The value creation process that occurs in financial markets requires firstly that a competence be detected, in order to, second, allow liquidity to flow to the firm and, third, to permit skills to be considered as an investment of the firm. Complete financial markets

could facilitate competence detection, but they would also eliminate any economic incentive to trust, since their fair market price will deny opportunities to obtain excess returns. From a financial perspective, competence development is typically a private topic based on trust, clear detection and crafting human capabilities. High average return-to-risk ratios are evidence of the economic advantages of complete markets. Finally, the long-term horizon required to trust in competence must not be confused with illiquidity, nor should its pass-or-fail financial performance be muddled.

True competence must, then, have worth even if it does not yet have a market price. "Competence value" is the brainchild that can support skill disclosure by expressing a financial valuation of its potential.

1 The Economics of Knowledge and the Value of Skills

There is a Venetian tale about two painters at the bottom of the Rialto Bridge selling hand-painted portraits of tourists' faces. A young couple decided to have their pictures painted at the same time, asking each painter to draw one face. The first picture cost ten times more than the second, leading the irritated couple to ask, "Why are you asking for so much more money than your colleague, having spent the same 15 minutes to prepare the painting?" The answer from the older (more experienced) painter was artful: "In my case, you are paying for these 15 minutes along with all the time required to develop my capabilities. Indeed, my colleague is cheaper because he is inexperienced, having only started this morning!" Our question is the following: Who is the more valuable painter? The veteran who has made a long-term investment in skill accumulation or the novice who is immediately able to compete with the senior painter? Or are they equally valuable?

Standard economics is based on exchange: in Latin, the phrase *do ut des* used by the ancient Romans describes this property. The value of an economic exchange stems from the utility gap between what is given and what is provided by the agents participating in the transaction. In fact, deciding to buy anything suggests that the utility obtained will be greater than the price you are asked to pay for it. Clearly, utility is subjective: you can decide to buy something that many others neglect, since such a thing has superior utility in your case. The market is an ambit where utilities are matched by fixing a (possibly unique) price that clears the market. On the other hand, the

utility you extract from the things you buy depends on their use in your own life. The more efficient the use, the higher the utility and, thus, the higher the price you will be willing to pay. Good managers usually extract more utility from purchases and achieve superior economic performance. In this way, they gather capital to be used.

However, you must be careful. The above model has a specific underpinning: inputs must be destroyed to obtain outputs. This means that specific inputs are irreversibly embedded in outputs. Once the transformation is complete, that specific input cannot be embedded elsewhere. In a very old-fashioned manufacturing approach to economics, you cannot use the same (piece of) input twice to obtain further outputs. Indeed, after the Industrial Revolution, energy use is the basis of this concept: coke is transformed into the product. Exchanges are the economic proof of this concept, while the principle of exclusivity in the use of inputs reinforces it. However, this concept does not apply to knowledge, since it can be used more than once and usually increases (rather than decreases) in value during use (i.e., experience leads to greater skill). Moreover, no exclusivity exists in the use of knowledge: the more you use it, the more it spreads into the environment (including the economic environment). Accordingly, in standard economics, the fair value of knowledge should be null, as the marginal cost of its production is zero. However, in efficient markets, a zero value implies no price, with a paradoxical result: there is no economic incentive for knowledge production. Thus, why do we accumulate knowledge if it is so expensive to produce and has no market value?

One possible answer to the above puzzle rests on the fact that skill accumulation is based on a very different concept than capital accumulation: uniqueness. Increasing skills does not require transactions; it requires training! Training involves a trial-and-error loop that allows the trainee to hone existing skills and accumulate new ones. The efficiency of the training process will increase with the quantity of time and knowledge involved, mainly in the diffusion and production of new skills. Since knowledge is unique in nature but not mutually exclusive in use, you can neither manage it nor use it in skills training through standard transactions. In fact, knowledge is transmitted by osmosis rather than through exchange; this means that diffusing knowledge requires no substitutes at all! You simply share: a new layer of knowledge is added to the previous layer, and they are sometimes combined. In the economics of knowledge, value creation is not based on utility gaps (arising from substitution) but on cross-fertilization processes (activated between existing and new layers

of knowledge). This helps explain the differences between knowledge and skills. Knowledge per se has a value unless it is secret, but its return-to-risk profile increases only when it is no longer a secret; that is, when knowledge becomes skills. "Know-why" is worthless unless implemented as "know-how" by developing "know-when" it has to be used! (Fig. 1.1)

According to this paradigm, the economics of knowledge substitutes the exchange concept with a share concept: you do not *buy* knowledge, you *learn* it. In fact, the acquisition of knowledge is based on osmosis. I cannot physically deliver my knowledge to your home; you have to read this book to acquire it. Meanwhile, your use of this knowledge is not exclusive, since I cannot stop any reader from using it. Moreover, your use of my knowledge does *not* destroy it but will, usually, increase it (through its use). Accordingly, the sharing paradigm has an incredible economic advantage compared to the exchange paradigm, which has been masterfully depicted in a Sir J.M. Keynes' sally: If you have a penny and I also have a penny, our wealth will not increase after their exchange; but if you have an idea and I have one, our wealth will double after sharing. A very different view of the fair value of knowledge arises than that depicted by the neoclassical marginalist approach to financial valuation: large excess returns stemming from capitalized (i.e., skilled) knowledge rather than a zero value based on its marginal cost.

The potential value of knowledge is therefore very high, even compared with its cost of production; the gross productivity (i.e., the returns from

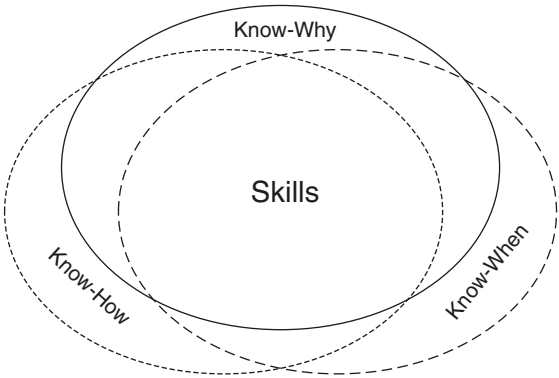

Fig. 1.1 The three components of knowledge are illustrated: why, how, when. Skills arise when you can amalgamate the three components in a fruitful way

investing) is much higher due to the contribution of the stratification of knowledge, which occurs over time. This leads to an economic problem: the proper identification of the nature of the costs of knowledge. In fact, you do not pay for knowledge per se but for the time required to accumulate it and the time that others spend supporting you in the osmotic process of sharing and acquisition. Indeed, the situation is similar to a sunk cost, which allows us to demonstrate the investment nature of such expenditures. The bulk of the cost/investment of knowledge is usually given, being related to its accumulation. The marginal cost of skilled knowledge is positive, *but it relates to the time required to share it* (as the Venetian Rialto Bridge tale clearly illustrates). The marginal cost of a single piece of knowledge/information is indeed zero, but the market price of skills/knowledge is higher than zero, since you pay for the bundle of present knowledge and the time required for its acquisition. This package cannot be unbundled, since you would reduce the osmotic process driving skills and diminish the utility of knowledge to a component of information, that is, to zero. Accordingly, investing in knowledge involves bearing the cost of the time required to accumulate/acquire knowledge and to profit from its deployment and use. The overall process is binomial (pass or fail), but it can be controlled and tested during the osmotic evolution (Fig. 1.2).

The value of knowledge differs from that of intangibles. In fact, the intangible value is still based on the exchange paradigm, while the knowledge value is based on the proposed share paradigm. It is very important to note that the mechanics of these two types of value differ according to the functions of time, since this is helpful for understanding the different measurement tools presented in this book. In the case of intangibles (as in classic capital budgeting choices), time relates to the expected output, such as profit deployment; therefore, the longer the time horizon, the lower the value. In knowledge economics, time instead relates to the required inputs; the longer the time horizon, the greater the probability of accumulating further knowledge. This profound difference in the relationship between time and value has a strong impact on value measurement. Standard financial techniques based on discounted cash flows encounter serious difficulties when valuing skills, since they are all based on time as a profit reducer rather than as a value builder.

The concept that time functions to support knowledge accumulation is useful for persons, corporations and organizations. In these bodies, skills are also accumulated and spread through the organization over time. Since organizations are also social bodies, such processes are facilitated by the

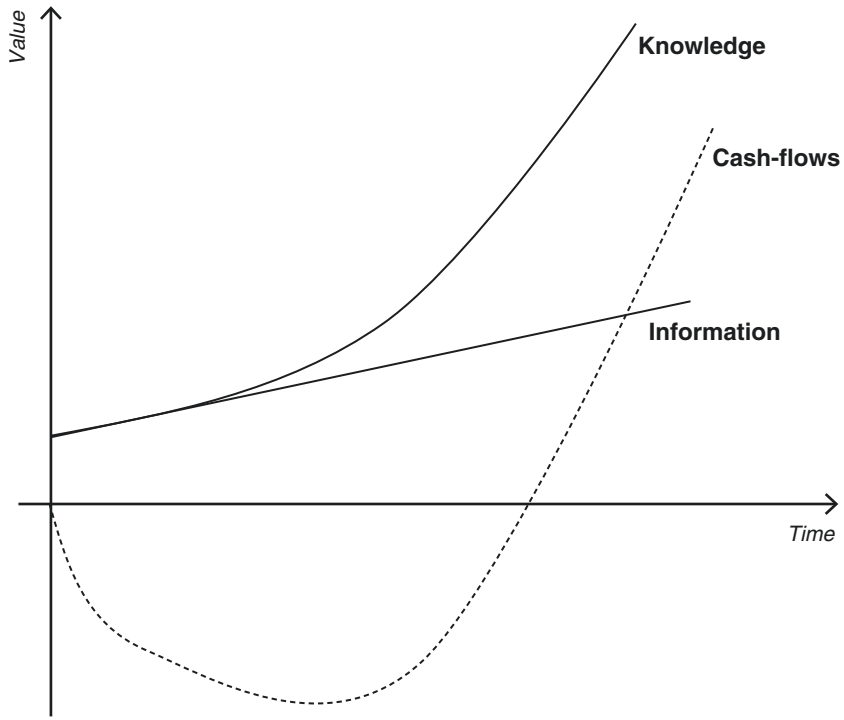

Fig. 1.2 Time evolution of information differs from the one of knowledge. This path is direct consequence of synergies emerging from the accumulation of knowledge. Dynamics of cash flows differ because of financial needs from the accumulation process and the higher efficiency generated from cumulated knowledge

existence of leaders within them, sometimes formally identified in hierarchies. The entrepreneur is typically a leader based on her/his ability to craft knowledge and skills. Leadership might originate from an initial bulk of knowledge owned by the entrepreneur, although it should continue according to his/her ability to develop more knowledge and put it to work (i.e., skills). By contrast, it is not so common that the entrepreneur might have the same capability to lead the process of sharing competences in the firm. Indeed, *the challenge of the entrepreneurial business is transforming personal skills into a corporate hallmark*. To achieve this result, the entrepreneur requires time (and money) to support the process, but she/he must also have the ability to activate the

osmotic process that permits that knowledge to be shared with a team. Several businesses remain one-man shows driven by brilliant entrepreneurs who are unable to share their knowledge with their staff. The economics of knowledge in business add a third stage to the "accumulation" and "skilling" components of knowledge: "pullulation". An organizational process needs time as an input to achieve stronger performance as an output.

The value protection given to entrepreneurial effort by the non-exclusivity principle of knowledge use is an intriguing element of the economics of knowledge and of the dissemination of skills in a firm. In fact, the value remains even with the continuous diffusion of knowledge. Accordingly, the concept of corporate risk must be fully reformulated: it no longer relates exclusively to price volatility but also to the entrepreneurial capability to determine the right gateway to market for the accumulated knowledge. The financial risk of funding an entrepreneurial business is therefore based on a very different concept: it stems from the cash advance (investment) required to bide the time required to cultivate and spread knowledge, while no measure exists of the true ability of the entrepreneur to identify the correct way to deliver knowledge to markets through useful goods or services. Such financing of time is very similar to a sunk cost, while the returns (if any) can be dramatic due to the lack of mutual exclusivity.

As knowledge diffuses into the firm, entrepreneurial risk becomes more of a standard corporate risk because of its diffusion. This can benefit corporate tradability, since markets prefer to address more standardized topics. Greater standardization also implies reduced information asymmetry, which can reduce the effective tradability of assets in financial markets. In other words, the pullulating process contributes strongly to reducing the illiquidity risk of entrepreneurial investment.

2 Entrepreneurial Skill as a Productive Factor in Business Economics

Skills are a productive factor in business economics if their accumulation and use contribute to the sustainable, long-term return-to-risk performance of the firm. This condition gives skilled assets a higher value than that of unskilled assets. As for any other productive factor, skills require maintenance: a job is more expensive than you might expect. However, before they can be maintained, skills have to be accumulated, itself a time-consuming job, where some specifics are to be understood in depth to frame entrepreneurial business economics.

The accumulation of capital stock has been widely examined in economics and other disciplines; all models of accumulations adopted at both the academic and practitioner levels refer to tangible and/or financial assets, that is, they are based on the concept of exchange and fungibility examined above. You can exchange your car for another one; you can reengineer your productive processes to improve efficiency; you can abandon sunk costs in favor of new investments. This means that in the case of stock capital, you can substitute, and you can do that through economic transactions that let you exchange items with other economic agents to extract higher benefits. This creates value for you, since the utility (i.e., the return-to-risk in investments) of the substituting item is higher than that of the substituted item.

In the previous section, we learned that the economics of knowledge suggest that we adopt a non-classical approach to the mechanics of sustaining the accumulation and productivity of human skills: osmosis-based processes substitute for exchange-based processes and contribute strongly to both the return-to-risk performance and the extraction of utility from transactions. Similar complications may arise for the detection of the drivers of the process of competence diffusion in any organization; indeed, a process of collective skill accumulation. In this case, the higher degree of complexity is a direct consequence of the fact that the training process acts on a team rather than on a single person, where the trainer is part of the team and his/her passion impacts team performance. In an entrepreneurial business, the entrepreneur is a trainer and a team member at the same time! In this case, osmosis also takes place in the organization.

The financial profile of the process must be different, too. In the case of skill accumulation, it is characterized by funding requirements over the entire time horizon: to become skilled, you must have enough money to survive the trial-and-error loop of skill accumulation, so that you can access above-average return-to-risk profiles. These risks of process stem from two areas: (a) the exogenous probability of completing the loop and (b) the endogenous option of the trainee to abandon the loop at any time. The skill accumulation process involves the sunk costs (for example, the costs that the more experienced painter tried to recover in the Venetian tale) derived from such risks. The endogenous option lets the entrepreneur abort any standard financing solution for the skill accumulation process and suggests drawing from either equity endowments or a loss from donors to the trainee (for example, the lower price of the junior

painter). In any case, the true margins become very difficult to detect, especially when adopting generally accepted accounting principles that suggest caution; that is, to deduct any sunk cost from current (or short-term) profits before the investment process is completed.

An intriguing financial aspect of the skill pullulating process in the firm is the economic sensitivity of skills to time due to the contribution of time elapsing to skill maintenance. In standard investments, time negatively impacts the value of cash flows. The longer the time horizon, the lower the value given a positive discount rate. This is because standard valuation techniques suppose that the time distribution of cash flows is given, namely, that there are no significant relationships between the length of time and the level of a specific cash flow. In fact, time is given as an input in any formula to compute the present value, while no opportunities to assume specific managerial decisions about the time to value trade-off are considered, at least outside the financial market. In skilled businesses, *time is the gateway to knowledge accumulation, to manage the endogenous risk and to put skills to work; therefore, time is the foundation of knowledge productivity and transforms it into a productive factor*. Indeed, passing time requires replenishment of the resources used to transform skills into competence by pullulating the knowledge into the organization. The more time passes, the more disruptive the returns that can be achieved. From a financial perspective, this implies a trade-off between sunk costs to bide time and sunk costs to increase economic performance through higher profitability. Time is no longer an instrument of present value but key to managing the productivity of knowledge.

The behavioral characteristics of the entrepreneur also matter. In entrepreneurial business, leadership is a key factor in the contribution of skills to business economics. In fact, we have already seen how leadership may help bring knowledge into the firm and transform it into skills that diffuse into the corporation. The firm is intended as a nexus of stakeholders, each with return-to-risk expectations (i.e., for their own performance) vs. corporate performance. The stakeholders have an economic incentive to maintain contracts as long as they can benefit from the transactions carried on through the firm. When these incentives disappear, the contract is abandoned. The firm is said economically sustainable (i.e., it is a long-term performer) when a stakeholder's decision to abandon the firm does not destroy the nexus. In an entrepreneurial firm, the nexus exists but the leadership of the entrepreneur (as a stakeholder) may become a critical driver to pullulate skills and keep the nexus sustainable in the long run.

If the entrepreneur exercises the option to exit the business (the endogenous component of business risk), there may be severe consequences if the skills were not transferred to the corporate structure. The capabilities to control corporate risk and to craft the governance structure of the firm are also key determinants of the marginal contribution of skills to the overall productivity of the firm.

To understand the real contribution of entrepreneurial skills to firm performance, we must first address a widely diffused misconception in managerial literacy: "entrepreneur" does not exclusively refer to an innovator. In fact, the key identifier of an entrepreneur is the bearing of risk, as John Stuart Mill explained in 1848. The view of the entrepreneur as an innovator only developed in the middle of the twentieth century when entrepreneurs were socially appointed to find new technological methods to produce. This idea of entrepreneurship is embedded in the old-fashioned mechanical approach: destroy inputs to create outputs. It bears no relation to the modern economics of knowledge. Reality has always been different; the entrepreneur is indeed an innovator but from an overall corporate perspective rather than from an exclusively technological view. What occurred over the last century was related to the specific needs of that historical period, particularly those arising after the Second World War. In the same way, a correct view of entrepreneurship must be considered. According to Hisrich and Kearney (2012) "the term entrepreneurship has historically referred to the efforts of an individual who takes on the odds in translating a vision into a successful business enterprise" (Corporate Entrepreneurship, p. 10). Thus, entrepreneurship represents a mode of management, usually using (and crafting) knowledge and skills to manage risky businesses. Still, the differences between entrepreneurship and management are sizeable in managerial studies and approaches: according to Hisrich and Kearney (2012), managers accomplish their jobs *through* people (and assets), whereas entrepreneurs do so *with* people (using assets).

This means that even the view of entrepreneurship as a fundamental characteristic of SMEs is outdated: the entrepreneurial spirit is not rooted in SMEs but in risk-control capabilities. The main difference between entrepreneurship in SMEs and entrepreneurship in large companies relates to the initial stock of knowledge and its maintenance. In SMEs, the entrepreneur usually confers the bulk of his/her knowledge to the firm (because of the sharing principle) and assumes leadership of the entire

firm, whereas in large companies, the entrepreneurial spirit might be already seeded. While large companies have economic incentives to develop competences and keep them within the firm through specific agency agreements, in SMEs, the entrepreneur is self-motivated to keep his/her competences current. SMEs usually involve less reversibility of the dependency between the entrepreneur and the firm's sustainability.

Firms exist because it is more convenient to produce goods and services through them. The economic production of a firm is joint: you cannot distinguish among the contributions of specific inputs in the final output. This means that you cannot unbundle the key inputs and, therefore, cannot identify the marginal contribution of the input to total production: it becomes difficult to set a fair price for the effort of each input. Economic results and corporate risk can only be correctly identified at firm level without discussing the marginal contribution of any productive factor. Their productivity is indeed joint, while all the inputs are (economically) embedded in the final output. The case for entrepreneurial skills makes no difference; the joint productivity concept still applies. The more innovative you are in satisfying unmet needs through new goods and services, the higher the entrepreneurial contribution to their production, that is, the greater the impact of knowledge and skills to their economic value. At the concept stage, the entire value of goods and services is based on an idea and the capacity to transform that idea into reality; it is based on entrepreneurship only. As the idea becomes a prototype, the contributions of the corporate team increase along with those of the tangible components. In the long run, corporate capability will be determined by the opportunity to create new products and services without encouragement from any leader. At this last stage, the entrepreneurial contribution has no differentiated qualitative contribution than that generated by the other productive factors.

The entrepreneurial spirit is the instrument that allows the dream to become reality, meaning that is the way to govern the firm's risk. This is because of the relationship between the competence of the entrepreneur and the ability to manage or craft risk. This point is worth analyzing more deeply. Again, it is necessary to address a misconception in managerial studies. The broader idea is to think about risk as an exogenous element: you cannot craft it; you can only try to protect yourself against downside risk (usually through hedging or insurance). This approach is correct if knowledge is homogenously diffused, say, never! Consider the example of a racer driving a "normal" car: *ceteris paribus*, competence will increase the safety of the drive, whereas his/her lower risk aversion might incentivize reckless driving.

This means that the exogenous risk is always the same, but the true risk exposure depends on skills (and their impact on risk aversion), namely, on the endogenous component or risk control, which relates to knowledge. The same situation occurs in entrepreneurship: increased knowledge does affect the true risk exposure of the challenge, while lower risk aversion might lead the entrepreneur to take too many risks in the business.

The agency problem that results from the combination of joint production and risk crafting should now be clear: How can you share economic performance between the risk moderator (mainly the entrepreneur) and all the other corporate stakeholders (mainly the funders of the elapsing time)? The question is deeply important to the long-term sustainability of the company. The chosen agency agreement may strongly impact it, mainly in the case of relations between the entrepreneur (supporting knowledge) and the financial capital (supporting productive capital). The joint productivity of invested capital and skills is the key problem in sound value measurement in entrepreneurial economics. The final output (business return) is unique, while the inputs are all identifiable in their nature, even if not always in their dimension. This is why it is very difficult to assign returns according to their marginal contributions if markets (both capital and labor) remain incomplete. The neoclassical approach to entrepreneurial business is then useless for a clear reason: capital can be separated from humans but competence cannot. Thus, when entrepreneurs sell their company shares, they are actually transferring the capital-only component of their legal title (the exchange paradigm applies), while their skills remain obviously theirs (the osmosis paradigm applies). This is why the selling price of shares can differ from (i.e., be lower than) their going-concern value. In fact, in going-concern scenarios, excess returns are supported by the contribution of the entrepreneur's competences, while in post-selling scenarios, no skill contributions exist.

A specific characteristic of entrepreneurial expertise refers to its convertibility from an individual feature to a firm hallmark, triggering a process of (intangible) corporate wealth capitalization. Once the process of skill transfer to the organization has been completed, wealth generation at competitive rates of return is due to increased productivity of corporate capital (only) due to the incorporation of human competence (i.e., the corporate returns are no longer person-related and the marginal productivity separation puzzle dissolves). At that moment, the corporate selling price and the going-concern value will converge, being based on the same return-to-risk expectations; thus, information risk (Allen and Gale 1994)

no longer exists. However, during the competence distribution period, the selling price will increase to the going-concern value, since competences are being "cloned" from the entrepreneurial brain onto the firm structure, thus remaining within the firm boundaries even if the entrepreneur sells shares. The corporate return-to-risk ratio is still satisfactory (vs. expectations) but it is affected by idiosyncratic information risk (Mantovani 2012) due to the marginal productivity separation puzzle. Accordingly, (i) markets are incomplete since the fair value exists conceptually but is not reflected in market prices because of a lack of trading, and (ii) contracts between agents are also incomplete, so information asymmetry increases along with the associated risk premium.

A very similar puzzle occurs in the typical managerial framework of the theory of the firm, even under very restrictive and unrealistic conditions (Modigliani and Miller 1958). Undertaking public ownership of a corporation and separating the means of ownership and control implies entrusting the firm to the competence of the management staff. The division of the increased wealth that is produced by managerial competence is negotiated between ownership and management through the agency contract that governs their relationship. Serious agency problems may arise, of course. The acquisition of skills by paying wages below their real economic contribution increases the value of property rights in equity capital but increases risk, since businesses require the continuity of managerial competence supply and skill development. Conversely, when corporate ownership and control overlap, principal–agent problems can arise in the transferability of property rights over the company and thus reduce the value of the firm. In this case, the necessity of an agency contract between the seller and the buyer relates to the persistence of competence after the deal is concluded (Williamson et al. 1999).

The quest for entrepreneurial business concepts (Covin and Slevin 1991) should now be quite clear:

- Skills and capital are jointly productive factors (drivers) of entrepre neurial business;
- The time required for the learning cycle in the organization is the element that separates them;
- The core measurement question is the identification of their marginal production;
- Massive agency problems may arise during the process if their own ership is independent.

Similarly to the cases of so-called "human capital" and even "business expertise", we face a special type of intangible asset with an economic profile that is found in the cycle of knowledge production and transfer and in capital markets. Increasing the portability of entrepreneurial skills via the market (i.e., together with the indistinct capital) will also increase the possibility that market prices incorporate the value of expertise. The conversion of competence value into a market price, however, can provide an extraordinary economic incentive to accumulate and cultivate entrepreneurial skills and channel money into entrepreneurial finance transactions.

3 The Cycle of Skill Contributions to Firm Performance

Herein, I propose an entrepreneurial business model based on the evolution of entrepreneurial expertise and its value.

As we have seen in the preceding paragraphs, competence evolves in three stages:

- **Knowledge** accumulation is the *know-why* stage, namely, the acquisition of raw materials for the next steps;
- **Skilling** is the *know-how* stage in which practice is added to the accumulated knowledge;
- **Experience** is the final stage, the *know-when* stage in which inspiration contributes to knowledge.

In the **first stage**, no practical results are usually obtained, since you simply become aware of new concepts and understand their mechanics. An excellent example of the knowledge stage was depicted by Albert Einstein concerning the Theory of Relativity: he became aware by observing that in railway stations, sometimes you think your train is moving when the opposite train is moving and yours is still stopping. That sensation does not complete the acquisition process; you must understand why you experienced the sensation (in fact, Einstein developed formulas that could explain what happened at the railway station). In economics, the first stage is based on the time spent acquiring knowledge; very few capital investments are usually required. In a typical corporate finance framework, such outflows are considered sunk costs, while in an entrepreneurial finance view, they are considered investments in human capital. The

problem relates to the mechanics of the risks involved in such an investment: the knowledge accumulation stage may not be completed, and its completion is a guarantee neither of its future productivity nor of proceeding to the next stage. The risk of confusing costs and investments here is very high.

Skilling knowledge involves experimentation with its use at a practical level. During this stage, some new knowledge is added to that previously accumulated; the application of previous knowledge can inspire how you put your theoretical ideas to work. Engineers are often good examples of leaders in this stage, since their experience permits them to apply ideas developed at more abstract level. In successful SMEs, it is quite typical to find some partners who are more know-how-oriented helping the more know-why-oriented partners apply their ideas. Trust is the glue connecting these people and building a team with superior capabilities, as demostrated by superior economics. However, at this step, the process is not yet completed: the prototype is produced but it has not been tested in the market. Meanwhile, the determinants of the firm performance are learned by the humans that form the team. In other words, spending money at this stage is investing in a human-related process with strong connections to specific people and their true behavior. Still, here, the endogenous component or risk matters.

The **competence stage** increases knowledge further by adding the capability to **decide on timing**. Inspiration is often the basis of the efficient use of knowledge; good ideas require good timing to be used. The case of Android software is a clear example: the company had know-why and know-how but only after its acquisition by Google could the correct timing to enter the market be chosen.

The three steps of knowledge evolution do not provide a complete description of the process from a financial perspective. In fact, the value of knowledge is usually considered "potential" until it acquires a market price. That is why accountants prefer not to include the value of knowledge (at any step) into official financial reporting. To be completed even at the financial level, competence must be given a market value. The creation of (competence) value is based on skills: no skills implies no value, but such skills do not imply market values. The passage of time as instrument for incorporating efficient learning into organization processes now spreads to the market, which must learn to appreciate competences; this also requires time. A additional element is required to complete the skills-

to-value connection in our model, value emersion, namely, the evolution of untradeable (i.e., highly person-connected) potential value into the market price of capital. Value emersion requires that skills be cultivated and transformed into competence, which can then be further disseminated throughout the corporation.

By integrating the evolution and the economics of knowledge, three stages of the entrepreneurial business can be observed: (i) in the entrepreneurial seed (E-seed) phase, skills are cultivated in order to be transformed into competences requiring capital investment (this being the value-creation phase); (ii) in the entrepreneurial pullulating (E-pullulating) phase, firm investments lead to better performance, although they still depend on the entrepreneur's commitment to the organization (i.e., the competence value is created but it is not fully established in the firm); and (iii) in the entrepreneurial completing (E-completing) phase, budding competence is becoming complete, knowledge is fully embedded in the organization, and the financial system increasingly detects its value (i.e., the competence value emerges as a market value) (Fig. 1.3).

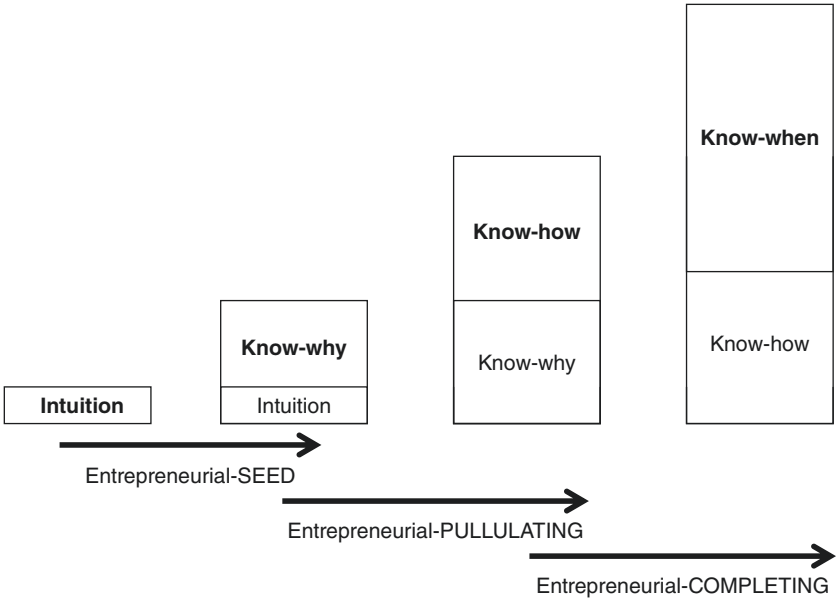

Fig. 1.3 The three stages of the Entrepreneurial life cycle contribute to cumulate knowledge and to produce skills

Return-to-risk profiles are highly specific in each of the three stages. During the E-seed phase, the returns are lower than expected and the risks are higher than supposed because yearly budgets are spent transforming skills into competence; the corporate value is (apparently) very low because the current return gaps are perceived as sunk costs to be recovered only over the two next phases. In the E-pullulating phase, the competitive advantage of competence emerges as a gross margin increase, while the sunk costs due to competence management are decreasing; this contributes to corporate risk reduction along with the reduction of the unfairly paid competence use. In this second phase, corporate value increases, but a gap with the potential (fair) value still exists due to the difference between the going-concern value and the market value. In the E-completing phase, the competitive advantage is fully acquired by shareholders and transformed into market value through goodwill values. At this stage, managerial decisions involving capital budgeting for further E-seed phases and governance-related choices may be required. Even if the return-to-risk profiles of the three stages are specific, valuation must refer to the three as a whole, making the persistence of the entrepreneurial contribution the common root, where a lack of persistence implies no value emersion (Zahra and Covin 1995).

According to the above-depicted model, we can understand how easily errors can be made confusing the competence value with the value of goodwill in standard valuation processes, concluding that no goodwill means no competence: the typical mistake observed in the use of Basel-related tools thus arise as an information risk that reduces capital allowances to SMEs. We will discuss this topic further in the next section, but some key points are presented here. Goodwill is a negotiable value because it assumes that the purchaser is able to fully appropriate the benefits that might be derived from investing. This means that goodwill is already instilled in the organization through competitiveness. Conversely, competence value is a non-negotiable value, the starting point of a potential state, since it is not entirely possible without completing the osmotic cycle of knowledge transfer to the company structure. The marketability of the competence value is far from that of goodwill (remember, slavery is a crime), but the corporate return-to-risk ratio is already improved. Moreover, the bankruptcy risk has been consequently reduced, thus allowing debt-funded processes to take place even if granted by legal entrepreneurship commitment (covenants). The full shareholder performance occurs later in the third stage.

Time is the key point in the above process, as it is a key driver of the economics of knowledge. The absence of time makes the conclusion of the cycle impossible, but the required amount of time is fully uncertain. In fact, you cannot predict the amount time you need to achieve complete knowledge, much less the length of time needed to become fully skilled. From an economic perspective, the contribution of time to skill enforcement is a direct consequence of the marginal productivity processes present in knowledge accumulation. Consequently, while the usual productive factors are characterized by decreasing marginal productivity, knowledge may exhibit increasing marginal productivity, at least at the beginning of the process. The declining marginal productivity of standard productive factors can be easily modeled through simple mathematical functions, but the time path of knowledge accumulation cannot be modeled easily, since the serial correlation is due to processes inside the human mind. In practical terms, this means that you may observe (apparently) very unproductive periods during which the human mind is (actually) testing the possible solutions to a problem until the correct one is found; at that moment, productivity increases dramatically. Accordingly, what you can measure/see in knowledge can dramatically differ from what is really produced; the Latin word "*otium*" best describes this apparently unproductive time. In other sections of this book, you will learn how to manipulate classic financial valuation tools to address this particular function of time and identify sound methodologies to detect the financial value of entrepreneurial competences. We anticipate that standard discounting techniques may be biased due to the different time functions described above.

The know-why accumulation phase is strongly determined by the invisible marginal productivity of knowledge. Producing a package of know-why expertise typically involves a trial-and-error process in which the frequency of errors reduces the (apparent) marginal productivity. Meanwhile, the experience gained through such errors is the true gateway to success in the forthcoming phases. Research and sports are typical fields that demonstrate this process: current defeat allows you understand how to win next challenge. In this phase, the capability to control the trial-and-error process is relevant to mastering entrepreneurial risk. This happens by detecting and separating true "lazy" time from "*otium*" time. An optimal entrepreneurial finance transaction should be able to provide funds during *otium* time and to reduce cash support during lazy time. This approach would also be optimal for controlling the agency conflicts that can arise from each entrepreneurial finance transaction.

When know-how starts to accumulate competence along with know-why, the puzzle of time productivity becomes even more complicated. This situation is very similar to that distinguishing basic from applied research: putting theoretical concepts into practice can be as difficult as discovering new theoretical knowledge; therefore, the productivity of time may become increasingly uncertain. One possible advantage of measuring time productivity during the know-how phase relates to the experimental approach that is typically adopted. In fact, the learning-by-doing approach is used during this stage. The measurement of success in learning-by-doing processes is clearly easier than is measurement in trial-and-error processes. In fact, you can more clearly distinguish between pass and fail steps, since steadily accumulated know-why helps clarify the connections between the current results and previous successes/failures. An optimal allocation of financial resources should thus be more closely related to the true increase needed to be successful in completing the package; therefore, it requires the true participation of the investor in the overall process and its monitoring.

Similar considerations exist for the know-when packaging into skills. In this case, the situation may be complicated, since the diffusion of overall experience is based on a training program involving the entire organization and hierarchy of the company, which adds some uncertainty. The advisory services of the financer are required during this stage, since the training process and its evolution will be easier to control for an external firm stakeholder. Being based on social behavior, training efficacy will be even more difficult to control, while true recognition of the final achievement of result will be difficult to measure. You must consider that this component of skills is particularly critical in the required transformation of skills from a personal hallmark to a distinctive corporate characteristic. The more the why–how–when triad is structured and connected, the easier it will be to make it a true component of the overall corporate heritage, increasing the probability of entrepreneurial success.

We can conclude that time is a true gateway to higher levels of productivity to be achieved through the more intensive use of skills in the entrepreneurial business. This is why time can no longer be a simple instrument of measurement, but it becomes a real input factor, which has to be measured to maximize its benefits. Accordingly, extended time horizons no longer represent a way to reduce the financial value of any investment as a consequence of lower discounting multipliers; they can represent a use of time to achieve higher level of productivity that would

otherwise be missed. While the relation between time and productivity can be very difficult to correctly detect, it seems to be a unique way to increase the overall (potential) value of an entrepreneurial initiative. This is why we suggest that in an entrepreneurial business, you must to think of time as a key productive factor, that is, one contributing to sound long-term skill productivity. Each entrepreneurial finance transaction will be at risk of default if time is considered a rigid component of the financial product as in standard corporate finance transactions.

4 Goodwill vs. Competence Value and Competence Value vs. Intangible Assets

If you think carefully about the features of the time in the process of joint production of capital and skills (Orser et al. 2007), you can identify a common matrix for the dynamics of the four variables (i.e., cash, time, payoff risk and risk aversion/premium) underpinning the value of competence and that are very useful for avoiding the information risk bias elaborated above (Reuber and Fischer 1999).

According to the above-depicted model, we can understand how easily the *competence value* can be confused with the value of *goodwill*, concluding that no goodwill implies no competence. However, this is due to the misperceptions of the true roots of the return-to-risk paths of the entrepreneurial business: the typical mistake one can observe in the use of Basel-related tools arises from an information risk that reduces capital allowances to SMEs. In fact, *goodwill* is a *negotiable* value because it assumes that the purchaser is able to *fully appropriate* the benefits that might derived from investing, i.e., it is *already* instilled in the organization through competitiveness. *Competence value is non-negotiable*, a starting point that leads to a potential state because it is *not entirely feasible* without completing the cycle of knowledge transfer to the company structure and *without the entrepreneurial behavior*.

In entrepreneurial business cycles, goodwill is not an asset but the final evidence of the competence persistence in the corporate nexus during the different stages of the cycle. You may think of goodwill as a consolidated competence value in the corporate organization. The *requirement of persistence* needs specific entrepreneurial finance tools to support the transformation process of competence value into goodwill. Long-term financial tools are required to allow time to act as a productive factor and contribute in the

meanwhile to control the agency profile of the entrepreneurial behavior. This leads to a correct perception of the resident risks vs. the behavioral ones. Perhaps structured debt funding with legal entrepreneurship commitment (covenants) provides good support. We will discuss this topic in Chapter 4. Full shareholder's performance is considered later, in the third stage. This leads to a discussion of entrepreneurship from a financial perspective.

– ***Goodwill*** is an intangible capital asset with value according to the competitive advantage of the firm. Its economic paradigm is based on the input–output logic, similar to any other standard productive factor. The input of this process is the corporate competitiveness, and the output is expressed in higher returns-to-risk ratio of capital investment. Similarly, in the case of any other productive factor, input destruction through a consumption process is a necessary condition for the production of the output itself (Rullani 2004): time is the technical condition that allows this destructive process to occur. As with any commodity, however, it is possible to reconstruct the input by providing maintenance or replacement investments, which are capable of affecting the process of depreciation (i.e., the process of capital consumption). Unlike physical capital goods in which the technical component contributes significantly to the amortization of the business, in the case of goodwill, the reverse can also happen (i.e., the value of goodwill may increase rather than decrease). This is because the competitive pressure (as input in the goodwill generation process) also significantly depends on the dynamics of the economic environment surrounding the company; to exploit this relationship is indeed the essence of the managerial job, once skills are rooted in the firm. Thus, the depreciation of goodwill is not consistent with what happens for tangible assets in the real world of business. The proof is that recent accounting standards state that goodwill value adjustments can be performed either on the basis of the findings of an *impairment test* (Bini and Guatri 2003) or as a result of joint verification of the impacts of the decisions of businesses and environmental dynamics on the value of goodwill. While this vision makes accounting data more closely approximate the carrying amounts of those financial markets, it maintains the principle of the consumption of the input for the realization of the output. This is also why goodwill is usually considered in the financial analysis ratio supporting funding decisions whereas the competence value is not included.

– ***Competence value*** is a corporate intangible asset with a value based on the potential use of the knowledge stock accumulated. This economic paradigm is based on the osmotic use of resources. It is based on an initial process in which entrepreneurial knowledge spreads into the firm and contributes to its structure (such as the ability to perform a particular production activity). When the process is completed, such an input is not destroyed as usual but cloned and becomes improved knowledge; thus, the initial knowledge must follow the release of more knowledge. Time is no longer merely a technical element but a different input with productivity stemming from the amount needed for cross-fertilization of the knowledge input and that which occurs independently in the structure. In the knowledge accumulation phase, time is a factor of production, creating major problems of perception and agency: there is no improvement in the immediate *performance* economic (because you have to wait for the completion of knowledge accumulation), thus leaving space for opportunism that consumes resources that would otherwise be used differently. By contrast, as the process of accumulation progresses, the complexity of the capital and skills bundle grows, affecting overall corporate productivity. Consequently, we will observe the initial emergence of market value due to the conversion of *competence value* into goodwill in the true sense. Indeed, this is the essence of entrepreneurial art at work in business economics.

CHAPTER 2

Contributions of Skills to Entrepreneurial (and Small Business) Economics

Abstract The success of an entrepreneurial challenge is based on the transformation of competence value into financial market values. To achieve this goal, the entrepreneurial challenge must ride a three-stage entrepreneurial life cycle: seed, pullulating, completing. Human skills are the key contributor to the cycle completion since they distinguish the essence of the entrepreneurial bravery: the ability to craft risks as John Stuart Mill explained since 1848. Such an ability evolves during the cycle, too, as the return-to-risk profiles dynamics in each stage of the entrepreneurial life cycle demonstrate. Time is no more a measure of performance deployment, but a true mean required to cultivate and harvest skills. In fact, when the overall entrepreneurial cycle terminates, the entrepreneurial business is fully transformed into a managerial corporation.

Keywords Entrepreneur's behavioral risk · Time functionality in skill accumulation · Entrepreneurial life cycle · Entrepreneurial seed stage · Entrepreneurial pullulating stage · Entrepreneurial completing stage

Based on the most recent evolution of entrepreneurship studies (e.g., see Baumol 1986, although there are studies dating back to 1968) and the previous exposition, we propose an entrepreneurial business concept based on the transformation of *competence value* into market value using time and the entrepreneur's behavior to implement efficient learning processes

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_2

within the firm. I call this the entrepreneurial lifecycle: in fact, the cycle ends when the entrepreneurial business is fully transformed into a managerial corporation.

1 The Entrepreneurial Lifecycle and the Growth of Firms

The entrepreneurial cycle cannot be interpreted correctly by adopting standard concepts from management studies. As Hisrich and Kearney correctly explain, "*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*" (Hisrich and Kearney 2012, p. 15). As John Stuart Mill suggested in 1848, the key difference between management and entrepreneurship is the bearing of risk. In fact, return-to-risk profiles are very specific for each stage of the entrepreneurial lifecycle. Since the nature of risk is a key element in defining the financial value of any initiative, the entrepreneurial cycle cannot be fully interpreted through standard financial conceptual frameworks, as they focus on the managerial profile of risk. In corporate finance, the value creation process typically relates to the emersion of the net present value of the assets, for example, goodwill. On the other hand, in entrepreneurial finance, this value creation process is filtered by – that is, it relates to – the actual behavior of entrepreneurs, who "*assume the major risks in terms of equity, time and career commitments by providing value for a product of service*" (Hisrich and Kearney 2012, p. 11). Entrepreneurial finance is based on a behavioral risk model that clearly separates the treatment of resident risk (the corporate finance risk) from that of behavioral risk (the entrepreneurial finance risk); indeed, Yazdipour (2011) proposed an *ante litteram* perspective theory. Still, Hisrisch and Kearney help us better distinguish between the two approaches as follows:

> To an economist, an entrepreneur is one who brings resources, labour, vision, materials and other assets into combination that increase product or service value and introduce and implement change, innovation and a new order. To a psychologist, such a person is typically driven by certain forces – the need to attain something, to experiment, to accomplish or perhaps to escape authority. (Hisrich and Kearney 2012, still on p. 11)

If you (i) keep in mind the different risk concepts in entrepreneurship and management, and (ii) compare the dynamics of productivity that determine the returns and risks of the entrepreneurial challenge over the entire cycle with those of a standard competitive company, you can detect the differences between the two financial approaches (corporate vs. entrepreneurial) and distinguish between competence-driven and NPV/goodwill-driven value creation processes.

Recall that (competence) value creation is based on skills: a lack of skills implies no value. However, such skills do not imply market values: no active behavior to spread knowledge into the firm prevents the existence of market values. A further theoretical concept must be added to value creation to complete the skills-to-value connection in our model: "value emersion", that is, the evolution of the untradeable (highly person-connected) potential value into the (highly capital-connected) market price of the business. Value emersion requires a skill tillage process to first transform them into human competences and to then disseminate them within the corporation, which becomes more competitive. A three-stage entrepreneurial cycle can be observed: (i) in the **E-seed** phase, skills are cultivated so that they can be transformed into competences that require capital investment (in this phase, competence value is created); (ii) in the **E-pullulating** phase, firm investments lead to better performance, although the firm remains dependent on the entrepreneur's commitment to the organization (the competence value is created but is not embedded in the firm); (iii) in the **E-completing** phase, competence is complete and the corporation benefits from fully embedded knowledge (the competence value has a market value).

2 The Expected Productivity of Competence, the Going Concern Firm and the Governance Tools to Increase Competence Productivity

Figure 2.1 shows the three stages from an economic and financial perspective: the red line depicts the productivity of a competitive (goodwill generating) corporation, while the blue line depicts the productivity of a competence-driven firm, both of which are compared with the expected returns generated by intangible capital (i.e., the cost of capital, in standard financial theory) indicated by the green line.

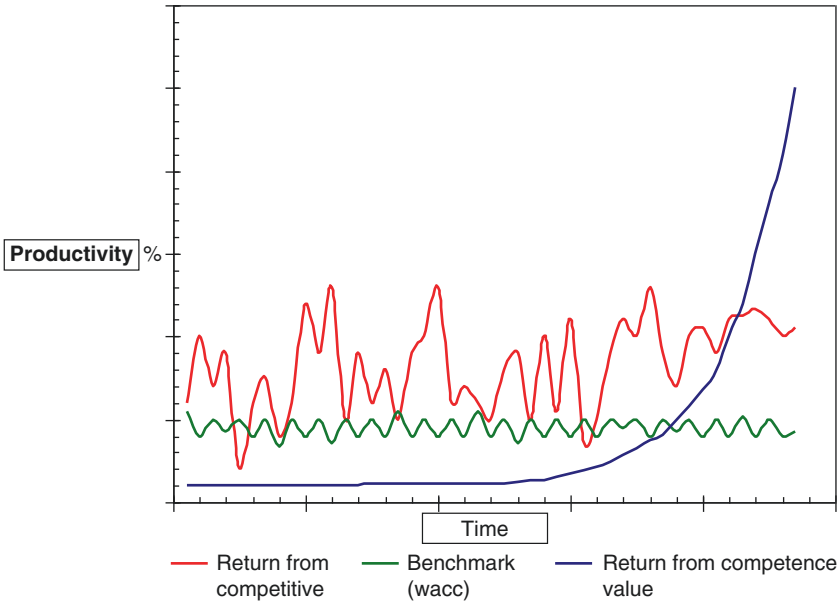

Fig. 2.1 Productivity for competitive and competence-based companies

During the **E-seed** phase, entrepreneurial returns appear lower than expected, while the risks are higher than supposed. This pattern can be a misperception: flows from the firm are low because of compensation between good margins and yearly budgets, which are spent by the entrepreneur to transformation skills into competence. Such investments cannot be properly accounted for, at least using standard accounting principles. These investments seem similar to sunk costs, as determined by the true behavior of the entrepreneur who is building competence but appears to do nothing but spend money. This contributes to the misperception. Corporate value is therefore very low because the large gaps in current returns versus the benchmark are perceived to be persistent, with little control over their recovery in the next phases. The short-termism that typically affects the modern financial system may further inflate the misperception. It can also be justified by the objective difficulty of detecting the true efficacy of the skill tillage process. Considerable information asymmetry also helps explain why business angels with competences

similar to those of the entrepreneur are key corporate investors during this first phase of the entrepreneurial cycle. In fact, they contribute more to the process by their action than by providing financial support.

During the **E-pullulating** phase, the potential competitive advantage from accumulated competences starts to emerge. Gross margin increases faster, while the sunk costs of competence administration tend to decrease. This helps reduce (or appears to reduce) corporate risk due to the use of unfairly compensated competences; in fact, sound entrepreneurial behavior retains profits within the company. In this second phase of the entrepreneurial cycle, corporate value increases with the increase in financial flows, but a gap between potential (fair) value and market value still exists due to the sizable percentage of behavioral risk (Yazdipour 2011) embedded in the corporate flows. However, the higher fair value is more closely related to the entrepreneur than to the efficiency of the corporate nexus. These issues should help you understand the main difficulties that professional advisors encounter in estimating risk premia to embed in discount rates during this phase: no sound models exist for determining behavioral risk premia.

During the **E-completing** phase, the competitive advantage is fully acquired by the corporation, which grows increasingly independent of the entrepreneur's behavior. Corporate performance growth surpasses the benchmark, and the gap between potential and market value is reduced via the emergence of a goodwill value, since cash flows grow much higher than those of strongest performing competitor. At this stage, it is highly probable that the entrepreneur would prefer to move into a new E-seed phase or to leave the company and start up a new venture, possibly as a business angel. Governance-related choices might be required since an agency problem emerges: who is entitled to the higher value, that is, how is the value is to be divided between the entrepreneur and the corporate stakeholders? This important agency problem is very difficult to solve at the practical level.

Even if the return-to-risk profiles of the three stages are very specific, valuation should refer to all three profiles as a whole, since the persistence of the entrepreneurial contribution is the common denominator. The value that becomes visible during the last phase existed in the seed phase, but it was invisible because of the difficulty of detecting the persistence of the competence contribution to corporate performance over the entire cycle. A lack of persistence implies no value emersion (Zahra and Covin 1995): persistence is thus critical to measuring the competence

value because this is the essence of the entrepreneurial art. Persistence is also the basis of the governance gamble.

According to the above-depicted model, we can now better understand how easily the *competence value* can be confused with the value of *goodwill*, leading one to conclude that no goodwill indicates no competence value. However, this confusion is due to the misperception of the true roots of the return-to-risk paths of the entrepreneurial business; excess returns are the key determinant of goodwill, and the key determinant of the competence value is the persistence of the performance path. This is also the typical mistake one can observe in the use of Basel-related tools, particularly in their application to SMEs; the role of concentrated ownership, along with a more intense interest in the performance level rather than the performance persistence, generates an information risk that reduces capital allowances. In fact, *goodwill* is a *negotiable* value because it assumes that the purchaser is able to *fully appropriate* the benefits that might be derived from investing, namely, the value is *already* instilled in the organization through competitiveness. *Competence value* is instead a *non-negotiable* value, a starting point that leads to a potential state because it is *not entirely feasible* without completing the cycle of knowledge transfer to the company structure and *without entrepreneurial behavior*. In entrepreneurial business cycles, goodwill is not an asset per se, but the final evidence of competence persistence within the corporate nexus during the entire cycle. Persistence requires specific entrepreneurial finance tools to support the transformation of competence value into goodwill. Long-term financial tools are required to help control the agency profile of entrepreneurial behavior and to maintain correct perceptions of resident risks vs. behavioral ones. Structured debt funding with legal entrepreneurship commitment (e.g., covenants) may provide adequate support. Full shareholder performance will be considered only later in the third stage. The following sections will explain the components of entrepreneurial performance that have to be given up in the short term, namely those that are subordinate in the forthcoming stages, to achieve financial results.

This leads us to discuss entrepreneurship from a financial perspective.

3 The E-seed Phase: Subordinate Returns to Innovate

The E-seed phase is the most innovative. In fact, this is the phase during which innovation is realized and tested through the acquisition of know-why. The entrepreneur needs a long time to complete this phase, which

typically results in a prototype. The larger the knowledge component of the prototype, the smaller the hardware component, as is widely demonstrated in digital businesses. This makes assessing the results of this phase particularly difficult.

The use of resources in non-standard processes in the E-seed phase tends to absorb cash. Accordingly, the rate of return from the business may be very slim, if not negative; in fact, it is highly probable that the overall absorption of resources may require more money than could normally be generated from peer investments. The high risk embedded in entrepreneurial businesses makes it difficult to determine whether such absorption is an investment or a cost; usually, the latter classification is preferred. As a direct consequence, the rate of return appears particularly low.

A very efficient economic environment should correctly distinguish between investments and costs. Similarly, it should detect when lower productivity is due to the use of resources during accumulation processes, such as those arising in the E-seed phase. In practice, this does not happen: the true economic cost of knowledge accumulation is the requirement for subordinate returns.

Subordinate returns must be considered very carefully. In fact, the term "subordinate returns" does not mean losing money: it indicates the readiness to postpone financial returns over a longer time horizon in order to complete the accumulation process. This implies a very patient investor: the overall average return of the investment may be very high, but its standard deviation may be even higher. An example may help clarify this point. In Table 2.1, compare the performance of three investments (a, b and c), each producing yearly average annual return of 10% over a 10-year period. The second investment (b) subordinates returns for at least 8 years but has high returns during the last 2 years that produce the same overall long-term average return as the first investment. As you may gather from the standard deviation in the table, investors in the second investment must be more patient (because of the first 8 years have poor financial performance) and have superior risk tolerance, since the volatility of the second investment is much higher (18.71%) than that of the first investment. Now, consider the third investment: the evidence of return subordination becomes clearer. In fact, the final return is still 10%, on average, although the volatility rises to 41.09% because the higher returns of the last 2 years offset the large losses (or investments?) observed during the first 8 years (Table 2.1).

Table 2.1 Examples of return subordination

year	*Returns of investment*			*Fair value of the investment*		
	a	*b*	*c*	*a*	*b*	*c*
0				100.00	100.00	100.00
1	10.00%	2.00%	–5.00%	110.00	102.00	95.00
2	10.00%	2.00%	–5.00%	121.00	104.04	90.25
3	10.00%	2.00%	–5.00%	133.10	106.12	85.74
4	10.00%	2.00%	–5.00%	146.41	108.24	81.45
5	10.00%	2.00%	–5.00%	161.05	110.41	77.38
6	10.00%	2.00%	–5.00%	177.16	112.62	73.51
7	10.00%	2.00%	–5.00%	194.87	114.87	69.83
8	10.00%	2.00%	–5.00%	214.36	117.17	66.34
9	10.00%	48.79%	97.73%	235.79	174.33	131.18
10	10.00%	48.79%	97.73%	259.37	259.37	259.37
Average	10.00%	10.00%	10.00%			
Standard Dev	0.00%	18.71%	41.09%			

The above example helps us understand the specific appetite for risk that an investor in the first stage of the entrepreneurial cycle must have. They must be ready to hold underperforming (losing) investments for a long time. The high risk arising from the behavior of the entrepreneur makes it difficult to make a sound assessment of the fair value reported in the columns of the table; the market prices for investments b and c will be usually lower than 100.00 at time zero. Indeed, this is subordinating returns. As the example should clarify, such subordination requires high productivity at the very end of the time horizon; otherwise, the financial profile will not be satisfactory.

4 The E-pullulating Phase: Subordinate Maturity to Create a Corporation

The E-pullulating phase requires subordinating maturity, meaning a rigid plan for knowledge dissemination into the organization cannot be imposed. In fact, the transmission of knowledge occurs through an osmotic process, which requires time: you learn from a person based on to amount of time you spend with that person. When this process takes place within a team, all the interactions among its components need

to be aligned to conclude that the skills have truly been transferred. In addition, the process is complete if the team is able to trigger further cycles of knowledge and competence acquisition independently. Only when this target is achieved can you truly say that competence has been integrated into the corporate hierarchy.

From a financial perspective, the E-pullulating phase is distinguished from the previous because of the stronger returns observed in this stage. In fact, the knowledge accumulated during the previous phase now produces returns. Such returns have the following features: they are usually above normal levels with lower than normal volatility, since they benefit from the knowledge accumulation that took place in the previous E-seed stage; on the other hand, they are highly person-related such that the absence of the entrepreneur usually involves lower corporate returns and increased volatility. Above-normal returns permit self-financing of knowledge dissemination to a team, although there are no guarantees that the process will be completed; you have no guarantees that the team will be in tune with the entrepreneur and you cannot trust in the capacity (or willingness) of the entrepreneur to transmit the acquired knowledge to the team. This is why several entrepreneurial businesses get stuck in this stage without completing the cycle: they maintain high performance but are always at risk because of the personal link that characterizes such financial results.

The **time subordination** that characterizes this stage has a large impact on the financial profile of the investment. In fact, the above-normal financial performance generated by the entrepreneur's skills has a very small impact on the return-to-risk profile of the investment when the duration of a stage increases. The additional time will contribute to higher and more stable returns that may even benefit the financial investor, although the risk of an unexpected decrease in business returns increases over time. Accordingly, investors needs to more flexibility and patience, along with the ability to understand the true reasons for delays in this stage of the entrepreneurial business cycle. In other sections of this book, a more formal treatment of this topic will be provided with reference to the concept of risk aversion. It is important to highlight now that the risk stemming from the uncertainty of the time horizon is very different from that stemming from volatility. In fact, paradoxically, volatility decreases during this stage, while economic risk increases because the firm has persisted. This means to subordinate time during this entrepreneurial phase.

5 The E-completing Phase: Subordinate Tradability to Create Market Value

At the beginning of the E-completing phase, the entrepreneur's skills are a true corporate hallmark. It is now time for the company to farm these skills to achieve even higher performance with lower than normal risks because of their superior competence. The problem in this stage is making financial investors aware of this characteristic, since financial markets are less efficient than expected, particularly for private companies. Accordingly, the tradability of corporate securities remains low until the market is fully aware of the corporate conditions.

Allen and Gale (1994) proposed a valid model to address this problem by stating the existence of an information risk in addition to a payoff risk. While the payoff risk is the true risk of contributing to corporate performance, information risk is a bias in the market perception of the payoff risk. As Mantovani (2012) demonstrated, the more innovative and skill-based the business, the higher the probability of having a large information risk component. The higher the information risk, the more difficult it is to trade the corporate securities, since an information risk premium depresses the liquidity of the market, even if the fair price is fully achievable. In this stage, investing in entrepreneurial finance ventures requires a superior ability to ride out waves of illiquidity in the market along with the patience to wait for the market to acquire the unbiased risk of the investment in full. When this happens, the information risk premium disappears, and the market price reaches the fair value.

During this stage, the behavior of a company can greatly contribute to overcoming the subordination of tradability. In fact, each decision made and action taken by the company is an opportunity to distribute information to the market and thus shape the information risk (in either the positive or the negative direction). We can conclude that in the E-completing phase, the same effort exerted by the entrepreneur during the previous stage to diffuse her/his personal knowledge must now be undertaken by the company to inform the market. Accordingly, a specific investor profile is required in this stage, since the ability to detect both the efficacy of corporate behavior and the information gaps in the financial market is required.

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As a concluding remark about the entrepreneurial cycle, consider the probabilities of moving from one stage to the subsequent stage. To complete the whole cycle, two boundaries between the three stages must be crossed, meaning that the joint probability of crossing all of them is lower than that of crossing each boundary. Moreover, the transition may also be influenced by the behavior of the entrepreneur, as the difficulty of moving from the E-pullulating to the E-completing phase demonstrates. This is evidence of the larger behavioral component of entrepreneurial risk, which is borne by the investor. Accordingly, a special configuration of an investor's risk aversion is required, since a tolerable mix of sustainable returns, time and tradability subordination must be present. This also explains why you often observe series of funding or financial supporters who participate to the overall entrepreneurial cycle. These topics will be described later in this book.

CHAPTER 3

In Search of Competence Value in an Incomplete Financial Market Context

Abstract Value and price are not synonymous when used for the assessment of capital. This is not mere semantic: only the adoption of a theoretical framework based on incomplete financial markets may help to solve the puzzle of the value-to-price gap in a sound manner. The value of any entrepreneurial investment can be considered as a bundle of two components: the emerged value (W_1) and the hidden one (W_2). While incomplete financial markets focus mainly on W_1 for price discovery, entrepreneurial finance deals are based on the W_2 emersion. By reading this chapter you may learn how to detect the hidden competence value (W_2) through T-ratio. The original methodology to compute the t-ratio is explained and compared with the well-known techniques for Q-ratio assessment.

Keywords Incomplete financial markets · Entrepreneurial risk tolerance · hidden value · Emerged value · Confident equivalent · T-ratio · Q-ratio vs. T-ratio

1 Value Creation vs. Value Emersion

This may seem like a simple question of semantics, but value and price are not synonymous when used in the assessment of capital. By adopting a theoretical framework based on incomplete financial markets the value-to-price gap may be soundly explained. The price equals the value only when

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_3

financial markets are complete; otherwise, the value may exist even if it has not emerged in the market price. This is the starting point for entrepreneurial value measurement. In fact, in entrepreneurial finance practice, you should aim to adopt a methodology of value assessment rather than of price discovery. Unfortunately, standard corporate finance methodologies are based on a price discovery, since markets are supposed to exist (i.e., they are complete) but be inefficient (i.e., capital is mispriced).

The **price** is the value assigned by the (financial) market. It is, by its nature, objective. It is the yardstick that the market uses to define the current monetary equivalent of the forthcoming benefits obtained though capital. The present value calculation allows us to understand the mechanism by which the (financial) market defines the above equivalence. Time and risk contribute to the determination of an annual rate of equivalence (the opportunity cost of capital) whose practical use is dependent on the time horizon that marks a specific flow of wealth (the discount factor). The previous chapters have already discussed the function of time in present value calculations, as well as its very small contribution as a source of uncertainty in both determining the cost of capital (Copeland et al. 1995) and calculating the discount factor. Neoclassical finance solves time uncertainty by adopting either "*instantaneous-time*" models (such as the standard CAPM approach) or *"continuous-time"* models (such as Merton's proposal). Both approaches aim to determine the risk-to-time relationship (Merton 1990) by identifying the market portfolio (1958) to which all investors refer when assessing values, regardless of their utility function. In this context, financial markets and intermediaries are perfect transformers of maturities and risks through the monetary certainty equivalent (CE): the price of capital. Once the maturity and the risk management puzzles are solved, the market prices are the values. Accordingly, the market must refer to frictionless situations only, such as information, transaction costs and taxes. The better the functioning (efficiency) of the market, the greater the amount of information embedded in prices, which then become increasingly reliable.

Why have a **value** – a potential price – other than the market price in financial theory? Essentially, for two reasons: (i) to correct market failures, or (ii) to address subjective expectations on the economic benefits vs. risks-time set (Arrow 1971; Debreu 1959). Scholarly attention has focused more often on the former reason in the neoclassical framework, since markets that are not in equilibrium are perceived as noisy. In ignoring the second reason, we miss the idea that some forms

of capital could be untradeable due to market incompleteness. This may happen because of the difficulty of detecting the complex mechanisms of flow generation and riskiness or perhaps the objective difficulty of calculation of, for example, information risk. In reality, the different perceptions of the time–benefit–risk *set* strive to articulate a specific time equivalence of the flows of funds based on a subjective set of expectations, capabilities and risk tolerances, all of which are strongly joint: this is the value of capital. The greater the difference between the value and the price of capital, the more likely the activation of negotiation (Rubinstein 1975), thus ensuring the survival of the market (Latham 1985): super-efficiency would stop transactions and the market itself, while the value-to-price gap provides an economic incentive to complete the market. Contrary to common knowledge, the gap between the value and the price does not indicate the degree of market inefficiency, only the distance between *sets* of subjective expectations of those who deliver value and those embedded in the market, that is to say, its incompleteness. The more frequent this condition, the greater the possibility that a unique market portfolio resolves the potential uncertainty (i.e., the maturity transformation capability of the financial system is rigged).

The efficiency of financial markets is therefore not a guarantee of value and price convergence, only a precondition to facilitate convergence through market transactions. Market efficiency is the condition that facilitates the overlap of the time–benefit–risk *set* relative to the expectations of possible sellers and buyers. However, this condition is necessary but not sufficient; to have instant price and value matching, an additional condition is required: the ability (or failure) of the financial market to assign prices to capital. Even in highly efficient markets, other conditions (such as uniqueness, high information risk, endogenous risk sources, and hidden productivity) may inhibit the price discovery mechanisms, leaving capital untraded: when this is the case, financial markets are called "*incomplete*" (Allen and Gale 1994). In incomplete financial markets, there is a *set* of efficient prices for only a fraction of capital goods or *negotiable capital*. This also affects the value (not the price) *of non-negotiable capital* through changes in the cost-effectiveness of non-tradable capital and, hence, its marginal productivity (Mantovani 1998). This condition is particularly true when non-negotiable capital is bound by ties of joint productivity with tradable capital. Any change in the price of tradable capital also affects

the values of non-tradable capital and reshapes the value to price ratios. Again, the impact of any price change on the cost-effectiveness of the bundle of negotiable and non-negotiable capital (i.e., on their joint productivity) conveniently allows negotiation over presently non-negotiable capital, which propels the completion of the financial market.

A typical example of the above situation is the case in which all intangibles require some capital to deploy their productivity, but only that capital can be easily financed in the market. If overall productivity is closely related to the intangible assets owned by the company (as is the case in many entrepreneurial SMEs), the rate of return of the bundle might be satisfactory, but the market price of capital might not incorporate the entire surplus value (goodwill?). In this case, the sale of intangible capital destroys the bonds of joint use with the intangible assets and therefore allows its economic exploitation: the value existed previously but was embedded in the negotiated price of the indistinct capital. In these cases, the ratio of effective to expected cash flows explains the difference between perceived values and market prices (Massari and Zanetti 2004) because the former assumes the continuity of the bond, while the latter supposes its dissolution. In an entrepreneurial business, the seller often has the feeling of having "sold out" the company because the assigned price reflects productivity that is not replicable by the buyer; thus, its contribution to the firm value remains unpaid. If the intangibles were instead inextricably linked to the corporate structure, the transfer of contingent rights on capital would also involve the transfer of exploitation rights for the future productivity of the intangible assets; accordingly, the difference between the value and the price would smaller. This tends to complete financial markets because the negotiation is over a *bundle* that integrates intangible assets into capital. However, the different (subjective) perspectives of the exploitation of intangible assets among potential buyers who compete against each other in the market could make the firm attractive to buy at different prices, leading to the incorporation of market prices into the value of future exploitation of intangible assets. This leads to "off market" prices for certain buyers and extremely favorable prices for others. The degree of market completion could then reach that of the degree of market efficiency by a separate negotiation over intangible assets. This improves the efficiency of capital allocation through the transferability of only part of the capital at a lower transaction cost (since the transaction is no longer anchored to the indistinct capital), further expanding the group of potential buyers.

Value creation is therefore not guaranteed to have a market price unless the market is complete. Incomplete financial markets provide strong economic incentives to allow the (created) value to emerge, thus encouraging entrepreneurs to fundraise. At the same time, their price-discovery mechanisms are all biased by the absence of comparison groups for value benchmarking, an exasperating aspect of entrepreneurial finance. The success of entrepreneurial finance transactions may also be influenced by the degree of financial market completion due to its relationship with the marginal productivity of overall capital, which alters the cost-effectiveness of the entrepreneurial use value. In fact, in (partially) incomplete financial markets, potential externalities relate to (i) the opportunity to obtain assets with higher value-to-price ratios and therefore reaping higher profits, and (ii) the dissolution of an asset price when negotiations separate productivity from an untradable asset and value is left to the seller. In other words, case (i) refers to financial investors who may easily bargain for undue value from entrepreneurs, requiring them to complete the skilling cycle; case (ii) takes place in share selling by very skilled entrepreneurs before the cycle needed to complete markets is finished. In both cases, a governance puzzle arises. The ability to contribute to the completion of the market is an incredible challenge for entrepreneurship and for entrepreneurial finance professionals.

This book suggests a conception of any entrepreneurial finance deal as a search for a solution to fund an entrepreneurial business while completing the financial market. Indeed, this is the only way to transform personal skills into corporate competitiveness and allow the competence value to emerge in the market price. The financial solution must prevent agency conflicts within the corporation and must adapt to the investor's risk aversion/tolerance. The primary impact of market incompleteness is on the capital structure choices of the entrepreneurial businesses. Classical financial theory suggests that financial leverage can be pushed to levels where the positive marginal contribution of the tax shield provided by debt is equal to the negative impacts of agency costs and bankruptcy (Robichek and Myers 1965). In the market completeness hypothesis (although not always made explicit), the business risk is taken as given and the leverage choice aims to modulate the impact on investors by splitting financial needs between debt and equity. Thereafter, the data refer to the book values of the assets, as represented in financial statements, which are set to equal the market values. However, if financial markets are incomplete, the (book) values and prices will differ

considerably, making it difficult to apply the classical approach (Mantovani 2003). In these contexts, the capital structure puzzle must first help unbundle the different sources of business risk based on the investor's appetite for risk; the share of funding is a direct consequence of this target. Moreover, the presence of significant agency costs arising from conflicts over the appropriation of economic benefits derived from the use of skills makes the classical approach even more difficult to apply. In these cases, you need to abandon neoclassical models in favor of *contingent claim* approaches to corporate finance that are based on a more general state-preference framework (Arrow 1971; Debreu 1959). In a contingent claim approach, the theoretical distinction between debt and equity capital is fully outdated, as it is based only on the quantity of (indistinct) risk to be covered by the lender. Contingent (entrepreneurial) finance must instead be based on loan agreements aiming to design suitable return-to-risk opportunities in terms of both quality and quantity of risk, as required by the investor's risk aversion in terms of duration, clauses, anchoring to specific performance variables, and formulas to guarantee non-property rights. In doing so, you may access funds and create opportunities for future market transactions of the invested capital, which is exactly what the entrepreneur needs.

From a legal perspective, the resulting transaction is still related to debt (Diamond 1991), but from an economic viewpoint, it is not: it is primarily *structured capital*, since its value depends not only on the asset price but also on the ability to adapt its flows to the productive conditions of the business, the only way to access point-to-point financial transactions that would not be achievable otherwise. It is then *brokered capital*, not only because it is provided through a financial intermediary but also because it requires the intelligence of a third party (although not necessarily a bank) to interpret the main drivers of the production cycle in order to *design* or create the tools that best fit to the parties' needs. Finally, it is *patient capital*, because (i) it is based on a variable investment time horizon, and (ii) it requires an investor whose risk aversion is consistent with business risk that cannot always be replicated in the market, being neither part of the systematic risk (because otherwise it would be replicable and the market would be complete) or part of the diversifiable risk (since to avoid it, you must forgo the contract rather than assemble a diversified portfolio). This is why debt capital is often observed in entrepreneurial businesses, contrary to any solution proposed by standard, neoclassical financial theory.

We will refer to this meta-debt funding as the "**capital** quota" (Mantovani 1998) of the entrepreneurial finance deal. It is a monetary capital flow that is available to the entrepreneurial business with a contingent financing transaction (Nevitt 1988); its remuneration is based primarily on co-participation in the results of a specific action. The value of the capital quota depends on the contribution of the funding to the accumulation of the overall asset value through competence or on the contribution it makes to the productivity of the individual factors of production that are funded through it. In this case, the entrepreneurial financing transaction includes an "**expertise** quota" to cover the financial needs of the cycle of skill accumulation and transformation into competitiveness. The monetary capital flow for this quota is typically provided by the entrepreneur by reducing payment for her/his activities. It may also be provided by external investors facing agency costs, as discussed elsewhere in this book. The expertise quota is also contingent but in a different way from the capital quota: it is related first to the *competence value* and its cultivation and subsequently to *goodwill* in the maturity stage of the cycle.

To resolve the agency problems involved in *competence value*, it is more likely that the capital quota of the transaction will tend to assume many of the characteristics of debt but will also assume some characteristics of equity capital. Indeed, the similarities with debt financing make possible that maximization of the contribution of entrepreneurial skills to corporate performance and provide an opportunity to allow her/him to acquire a large portion of any excess earnings until the expertise quota has fully transformed the competence value into goodwill (i.e., it will be a negotiable value). Conversely, equity capital will prevent the agency conflicts arising from the destruction of joint productivity that could reduce the solvency of the company. Regarding the similarity with the equity (venture) capital, however, the credit is granted with a fair return at the very end of the competence cycle by liquidating a large share of the revealed value of the skills (goodwill). Thus, the investor's performance expectations will be satisfied despite the asymmetric economic risk distribution (biased against of the lender) in the early stages of the skill cultivation cycle through provisions charged over the funded entrepreneur, such as resale share capital constraints or other *covenants* (Unicredit 2004).

In carrying out these financial deals and evaluating entrepreneurial opportunities, financial market incompleteness requires methodological tools to estimate the potential value of skills. Neither the book values nor the market values appreciate the full capital and expertise quotas, since return-to-risk analysis only helps to identify their joint productivity (Fama and MacBeth

1973). As only a mix of these two types of entrepreneurial capital funding is able to complete the financial market and allow the value to emerge by transforming skills into goodwill, funding through debt is superior during the competence dissemination phase: Contrary to the standard Basel-based approach to SME financing, (structured) debt can be superior in entrepreneurship because it helps complete financial markets in the competence value cycle.

2 Market Price, Fair Value and Hidden Value

Why market incompleteness can explain more of entrepreneurial finance than market inefficiency

Why do standard capital markets not trade competence value as an asset? The answer is that competence is unique, since it is related to a specific person. We considered this topic in a previous chapter in the discussion of the business economics of knowledge. In addition to that discussion, a market-related explanation can now be added: (financial) markets need standard goods to activate sufficiently large flows of supply and demand to function properly, that is, to generate affordable prices. Otherwise, markets are unable to express the market value (i.e., the price) of anything. This is why paintings such as *Mona Lisa* have no market price even if everybody recognizes their value.

As discussed above, the nature of competence is non-standard; accordingly, it will be very difficult to agglomerate sufficient demand and supply to allow negotiation. This is why competence has no market price. On the other hand, it has a (financial) value, since we know that competence helps increase company returns above the standard levels. The present value of such an overflow must determine the economic contribution to overall corporate wealth and, thus, the competence value. However, we also know, from Chapters 1 and 2, that serious agency risks may arise from attempts to regulate the contributions of such competences to the financial performance of entrepreneurial firms. The joint effects of these agency problems and small flows of demand and supply make it difficult to determine a fair discount rate to compute the present value of the overflows generated by entrepreneurial competence; therefore, it is difficult for market agents to determine the fair price and trade the asset. Like *Mona Lisa*, competence has a value (because there is an overflow to distribute to investors) but no price (because no benchmarks exist for the cost of capital). To capitalize the full value of competence, you must wait for the economic contribution of competence to be revealed: recall that *the*

competence value is typically hidden. If you agree with this sentence, the economic question is thus the following: Is the price missing due to an infinite risk premia generated by agency problems or is it due to the lack of demand and supply interactions? By answering this question, we can try to provide a solution to the competence value assessment puzzle.

Very generally, when market prices deviate from fair values, markets are inefficient; when prices are fully hidden, it is highly probable that markets are incomplete. In fact, the case of an infinite risk premium is highly theoretical, and efficiency problems can also arise with tradable assets, while incompleteness leads to no prices at all due to the absence of trading. This might help us intuit that market incompleteness is generated by the absence of matching between the return-to-risk profile of the investment and the risk tolerance embedded in the market as a whole. To clear the transaction, you need to select a few investors to make unique investments, since a general split of the unique investment among a large group of investors is rejected. In other words, financial markets fail to fund entrepreneurship because this would need a one-to-one connection between the risk profile of the investment and that of the investor.

When market inefficiency constrains the price discovery process, the problem stems from the market side alone, as the assets are in fact tradable. You have a market price but it differs from the fair value, since market inefficiencies bias the risk premium and the discount rate, thus generating the gap.

Market inefficiency => Price ≠ Value

When the market incompleteness limits the price discovery process, the source of the problem may be from the asset side, being it so specific as for the competence case. While in the case of market inefficiency, you have discount rates, although they can be biased, *in the case of the market incompleteness, you do not have any discount rate at all*, usually because you have no benchmarks to estimate it.

Market incompleteness => ∃ Hidden Value (Price = 0 and Value>0)

Incomplete markets require an alternative to the discounted cash flow methodology in order to assess the value. You need a method that matches the investor's risk tolerance to the investment's risk performance.

A special case of hidden value may exist when bundles of capital alone are traded, as in the capital + expertise quota discussed in the previous section.

In this case, the market price refers to the bundle as a whole, and there are no opportunities to trade the components in separate transactions. In practice, the market price refers to the main component of the bundle (e.g., the capital quota), while the "accessories" (e.g., the expertise quota) do not seem to have specific values. Typical examples are contracts for mobile phones in which you buy the phone's capabilities along with accessories, such as text messaging or Internet browsing. Even in these cases, the market is considered incomplete, at least until you are able to select and trade the specific components of the bundle. The case of bundled goods fits the case of competence; in fact, some entrepreneurial investments appear as investments in securities (either debt or equity capital) that are bundled with the entrepreneurial skills. As in the example of the mobile contracts, the following question arises: What are you really paying for?

We must typically frame the competence value under incomplete market conditions, and the entrepreneurial cycle that embeds entrepreneurial competence into the firm is an economic process that helps complete the financial market by transforming such hidden values into increasingly tradable values. The competence value is the hidden value that precedes the market value, while the entrepreneurial cycle is the process that allows it to emerge by eliminating both incompleteness and inefficiency. Their joint development is the source of any successful entrepreneurial finance transaction that aims to reveal the competence value.

Entrepreneurial finance should then be thought of as a mix of financial and organizational practices that facilitate both value creation and its emersion. The considerable financial gains that can be achieved through entrepreneurial finance transactions are direct consequences of the hidden value that emerges with market completeness. This compensates the selected investors for the risks they bear. Accordingly, we can differentiate entrepreneurial finance from other financial disciplines (such as corporate finance) by its closer relationship to market incompleteness than to inefficiency and by its greater use of business economic tools to complete the transaction in a satisfactory way.

3 Incomplete Markets and the (Hidden) Value of Entrepreneurial Skills

At a theoretical level, financial markets are said to be incomplete when prices cannot be observed for the payoffs arising in all possible forthcoming states of nature. At a more practical level, this means that the valuation

process, which occurs via markets, is missing some value drivers: some of the value remains hidden, as discussed in the previous section. Therefore, markets prices and values deeply diverge due to the missing states of nature, and the larger the gap, the greater the resulting degree of incompleteness. A formal explanation of why entrepreneurial skills are included in the value hidden by market incompleteness and, thus, of the existence of the **competence value** follows.

First, it is useful to explain the basics of the concept of incompleteness using a simple example. Consider an economic framework with three possible states of the world: up (+), down (-), stable (=). In this economic framework, you may negotiate contracts that pay you 1 euro if and only if a specific state of the world occurs. Consider, e.g., insurance contracts or derivatives. In the theoretical language of contracts, these are called "pure securities".

The market value of these contracts will depend mainly on three key issues:

- What is the probability that a specific scenario occurs? The higher the probability, the higher the market price;
- How risk averse are the traders? The higher their risk aversion, the lower the market price, since higher rates of return (i.e., higher risk premiums) will be required;
- What is the length of time for scenario deployment? The longer the time horizon, the lower the market price.

Given the above considerations, it should be clear that the current market price of each contract is less than 1. Therefore, the fair value of the contract (hereafter, W) must be $W<1$.

A fourth issue is now considered in the price discovery process: How many people will bid and ask for those contracts? In fact, the greater is the mismatch between demand and supply, the larger the gap between the actual market price (hereafter, P) and W. If no bid or ask prices emerge at all, when demand exceeds supply, $P>W$, and vice versa. It is realistic to suppose that the traded quantities will not be distributed uniformly over the three contingent scenario contracts; in fact, the trader's specific level of risk aversion will push her/him to negotiate a state-specific contract. Please note that this fourth condition is more realistic than the perfect market condition of infinite elasticities of demand and supply for securities and, indeed, of the non-significance of a single investor's risk aversion.

Moreover, you must consider that the gap (P-W) is generated by the subjective situation of a single trader and not by market inefficiency. This proves that market incompleteness may not overlap with market inefficiency: markets can be very efficient even if they are very incomplete, since efficiency refers only to traded securities.

Let us consider some figures to clarify the above concepts. Based on the three initial scenarios, the fair values of the three contracts are reported in Table 3.1.

Since mismatching demand and supply occurs for two of the three contracts, their market prices diverge from their fair values. In the + scenario, a sizable supply reduces the prices (0.25) below the fair value (0.4), whereas in the – scenario, excessive demand inflates its price (0.5) above the fair value (0.4). There is no gap in the = scenario, and the prices converge on the fair value (0.6) when demand equals supply.

Now suppose that you are a "normal" investor who puts money into a security with the following state-contingent payoffs: 10 for the + scenario; 5 for the = scenario; –4 for the – scenario. Given the market prices of the above state-contingent contracts, there is no arbitrage in

Table 3.1 Values and prices in three possible scenarios

Initial status						
Scenario	*W-Value*	*Demand*	*Supply*	*Price*	*Volumes*	*Total*
+	0.4	80	100	**0.25**	80	20
=	0.6	80	80	0.6	80	48
–	0.4	100	80	0.5	80	40
					Overall Wealth	**108**

Table 3.2 Values and prices for the "normal investor" in three possible scenarios

Initial status							*"Normal" Investor*	
Scenario	*W-Value*	*Demand*	*Supply*	*Price*	*Volumes*	*Total*	*Quantity*	*Value*
+	0.4	80	100	0.25	80	20	10	2.5
=	0.6	80	80	0.6	80	48	5	3
–	0.4	100	80	0.5	80	40	–4	–2
					Overall Wealth	108	Wealth	3.5

the market (i.e., the market is *efficient*) if the market price of the security is 3.5 euros, as shown in Table 3.2.

On the other hand, the fair value of the security is 5.4 ($= 0.4 \times 10 + 0.6 \times 5 - 0.4 \times 4$), so 1.9 of the value (i.e., 54% of the apparent price) is missing. This gap can be better understood if you suppose that you, as the normal investor, would hedge the risk of investing in the security only for the bad scenario. You might achieve this target by buying 4 insurance contacts contingent on the bad scenario; however, it will be impossible to complete this transaction due to excess demand in the market. In fact, the market is incomplete, and you cannot negotiate the insurance contract alone. In this framework, the value gap seems to be missed forever, but the below fair market price provides a unique incentive to invest in the security. Thus, the market is fully efficient since you have no arbitrage opportunities, but the market is also incomplete since you cannot recover the missing value.

Now suppose that Mr. Teofilo Intato (a risk lover) decides to enter the market and sell you the 4 contracts you require to hedge against the worst-case scenario; the market value of this transaction is 2 (=4×0.5). To keep our example simple, let us suppose that the revenues are used to buy contracts that are contingent on the best-case scenario: Teofilo is allowed to buy up to 8 contracts (=2/0.25). This related transaction can take place given the demand surplus for contracts contingent on the worst-case scenario and the supply surplus for contracts contingent on the best-case scenario. This transaction protects the normal investor immediately and creates potential value for Teofilo: in fact, his zero market cost portfolio of contracts has a value of 1.6 (=8×0.4–4×0.4): both the utility you derive as normal investor and that derived by Teofilo increase. You must also consider that the new transaction affects the entire financial system by driving the market price of the security (3.5) toward its fair value (5.4). The 54% increase is due to the recovery of the missing value.

Suppose that Teofilo, an entrepreneur with above-average skills, finds himself in the + scenario. We can imagine an even more efficient solution than the previous one: a joint venture between the normal investor and skilled Teofilo, that is, a bundle in which Teofilo assumes the entire negative payoff of the – scenario versus the investment required to fund the hedge program (2 = 4×0.5) to finance a payoff of 8 in case of the + scenario. This bundle creates value in three jumps: the first jump is a direct consequence of market completion, which moves the price toward 5.4, the fair market price for the security; the second jump adds a potential value of 1.6 (=8×0.4–4×0.4)

to the current market price, which now ranges between 5.1 (=3.5+1.6) and 7.0 (=5.4+1.6); the third jump is direct consequence of the market acknowledging the superior payoff of the bundle in the up scenario, which pushes the price up to 8.6 (=5.4+0.4×8). The 146% overall increase represents an increase of 54% due to market incompleteness and 91% due to Teofilo's skills. Here, 0.8 is Teofilo's current competence value, computed as the algebraic sum of the value that his intervention creates in the upside scenario [1.2 = 8×(0.4–0.25)] minus the value he protects in the downside scenario [–0.4 = 4×(0.4–0.5)]!

The above example is oversimplified to clarify how the value can be derived. One key point is relevant: Teofilo's choice to enter the market must be based on a superior ability to drive investment toward the best-case scenario. If such a capability really exists, then the rate of return will be impressive: 146% if only the initial market price is considered (i.e., 3.5) or 69% if the overall investment bundle is considered (i.e., 5.1 = 3.5+1.6). The fair return contingent on the + scenario would only be 85% (based on a payoff of 5.4 compared to a payoff of 10). A second key point is also relevant: the instant return achieved through Teofilo's intervention is 54%. This means that completing the market creates value independently of the entrepreneur's true ability to drive investment toward the best-case result. Entrepreneurial finance intrinsically provides enormous economic incentives (54%), independently from the very attractive returns that entrepreneurial skills may generate (between 69% and 146%). Arranging entrepreneurial finance transactions involves writing down the risk-sharing agreement between Teofilo and the investor in order to derive both market (3.5) and competence (5.1) values and achieve superior results over the short (54%) and long (69–145%) term.

The above example occurs over one period to avoid complex calculations; accordingly, all the values are generated instantaneously. In the Chapter 2, we learned that time functions a bit differently in entrepreneurial investment than in standard corporate finance. Longer time horizons help increase payoffs from the competence contribution and reduce the survival probability of the entrepreneurial challenge through the various stages. This widens the gaps among the potential competence value (1.6 in the example), the complete market value (8.6) and the payoff in the case of entrepreneurial success (18 = 10+8). Accordingly, a more complex methodology is required to measure the competence value than that used in the example, although the concept is clearly described. Such a methodology is described in the next section of this chapter.

Regardless, a more concrete example can more usefully explain difficult concepts than can a simplified example and provide insights into the forthcoming explanation of the methodology. In the summer of 2014, the Luxottica Group suffered a large drop in share prices due to the resignations of two consecutive CEOs over a very short period (approximately one month). The ability of the company tycoon, Mr. Del Vecchio, to recover and convince financial markets of the stability of the value of Luxottica shares was widely discussed. The discussion focused on the link between the personal skills of the top management team and the market price of the shares; indeed, a competence value puzzle with large decreases in the market prices of Luxottica shares emerged in August and September of 2014. The corporate problem was finally solved by appointing a new CEO, which stabilized the price path and convinced the market that the precipitous drop was due to contingent inefficiencies. The fear of a strong relation between the market value of shares and the human capabilities within a company was strongly supported by Luxottica's very high price-to-book values, averaging 4.2 at that time. If we consider the book values to represent the replacement value of the company's assets, the excessive 3.2 price-to-book ratio supports financial analysts' fears, even in a classic corporate finance framework. The history of the company itself may support such a view. Mr. Del Vecchio started Luxottica in the village of Agordo in a northeastern Dolomitic county of Italy in 1958.

However, this discussion is also useful for trying to estimate Mr. Del Vecchio's competence value when he formed the company. In fact, the long-term beta of Luxottica shares is 1.30; accordingly, the estimated long-term equity risk premium is 7.15%, supposing an Italian market risk premium of 5.5%. The survival capability of the company is supported by its continuous existence up to 2014. As a consequence, the replacement value of its capital assets (i.e., using 1 as the denominator of the price-to-book value fraction, so that we are all on the same page) can be considered safe in the long run. If we adopt the above risk premium to compute the present value of the intangible component of the price-to-book ratio, 3.2, at the very beginning of the company, the final result would be 0.1028. Therefore, we can fix the value of the bundle made up of revolving capital assets (1.0) and Mr. Del Vecchio's capabilities (0.1028) at 1.1028. No one knows how much faster the company could have developed if the capital allowances given to Mr. Del Vecchio in 1958 were inflated by 10.28%; the negative impact of market incompleteness is of the utmost

importance in this story of a young man who started a company that would become one of the most successful in Italy.

4 Risk Aversion in Incomplete Markets

The contribution of risk aversion to financial markets is among the most difficult concepts to capture fully. The reason is simple: human behavior is mainly driven by utility, that is, a filtered representation of any element comprising the economic environment, according to human moods. This generates a considerable number of measurement problems, since an easy, sound and widely diffused method of detecting utility does not exist. Accordingly, the complex connection between objective economic factors (e.g., market prices) and the economic agent's behavior is very difficult to fully detect. Risk aversion functions as a filter between the relevant economic element and the true behavior of the economic agent; therefore, the characteristics of risk aversion may help explain the real equilibrium observed in the financial system. Similarly, risk aversion detection helps explain why some decisions may deviate from rational expectations. This is why some financial economists suggest that the more recent behavioral approaches to finance may provide a sound framework for the determinants of risk aversion (Ross 2002). Hopefully, no one will ever completely solve this puzzle, or economists, particularly at the business level, might disappear.

In standard financial economics, risk aversion is a concept typically considered at the market level: the average risk aversion impacts the market equilibrium, as in Mehra and Prescott's equity premium model. A single risk-aversion level contributes to the average market level but has limited effects on the mechanics of the financial market equilibrium. According to Tobin's two-fund separation theorem, the personal risk aversion of the investor may impact the adopted portfolio mix but does not contribute to the identification of the overall market portfolio. In fact, the more risk tolerant the investor, the higher the proportion of risky assets included in the portfolio, and vice versa. In any case, risky assets are identified unequivocally with the market portfolio. The single investor's risk aversion helps determine the decision to trade risky securities overall but does not determine the selection of the risky assets.

A direct consequence of this approach is that risk is relevant only for its quantitative profile (i.e., volatility), while the qualitative determinants are less relevant (since only systematic risk matters). This is equivalent to

saying that risk aversion to the idiosyncratic/investment-specific risk is zero, since no influence on the investor's choice arises from an appetite for a specific risk component. This is also a direct consequence of market completeness. In fact, high probabilities of match demand and supply require continuous negotiation over standard securities; therefore, there is limited room for investment-picking strategies. When markets are incomplete, tradability is reduced, and any investment picking is precluded; the complete absence of trading lets us suppose that any form of risk aversion is irrelevant.

The above conclusion for incomplete markets seems very far from incentivizing any initiative in entrepreneurial finance: in fact, low tradability and picking preclusion is the exact condition that you may observe for this kind of transactions. In truth, the puzzle is a bit different. The status of incomplete markets follows from the absence of affordable prices, which is a direct consequence of the clearing of continuous negotiations generated by a large crossing of demand and supply (i.e., market depth). One or few sporadic transactions do not mean market. Their (unique) values are a direct consequence of the specific aim of the (only) two willingness involved into each transaction. We can call this condition a "point-to-point market": an exchange where picking the counterpart of the transaction is the substrate of any choice. Point-to-point exchange has completely different conditions on risk aversion than traditional exchange: only the idiosyncratic component of risk is relevant, while the importance the systematic component tends to disappear. This can be a direct consequence of market distortion by "amateur" agents that distort risk aversion, or of an "elite" market comprised of people with a superior ability to control a specific risk component (superior competence). Entrepreneurial finance transactions refer to the exact conditions above: as the quantity of point-to-point transactions increase, the market moves toward completeness. A superior ability to tolerate or control a specific source of risk pushes the investor to search for opportunities that fit her/his attitudes and to invest as many resources as possible in such opportunities. This approach is the exact opposite of what neoclassical finance and professional best practices suggest, and insights into risk aversion may help explain the apparent contradiction.

We can now start formalizing the above concepts, although a more complete treatment will be provided in subsequent sections on the complete valuation model. Risk aversion (A) is the investor's optimal substitution rate between return and risk, so that no impact on utility is expected.

$$R = A\sigma^2$$

where R is the relevant rate of return, and σ is the relevant measure of the quantity of risk.

We can breakdown the overall investment risk (σ) by decomposing it into its elementary components and the relationships connecting the components. By adopting a technique similar to that adopted for financial portfolios and supposing N elementary sources of risks, you may decompose σ into N^2 elements and their relative weights. You will detect N stand-alone sources of risk (the same figure as that of originating risks) along with N^2–N = N(N–1) factors of covariance between each risk component. Overall, the N(N–1) elements are made up of ½N(N–1) couples of identical figures. In business economics, the covariance matrix is a direct consequence of managerial choices rather than exogenous risks. Accordingly, by manipulating each of the N elements, you manipulate at least the concomitant 2(N–1) covariance pairs. A larger than expected contribution, indeed.

We can also think of the investor's risk aversion as the average result of his/her aversion to each of the N elementary components along with their connections. Therefore, you observe aversions to N^2 components that are grouped according to each source of risk – N variances + 2(N–1) covariances. Unbundling risk aversion into its elementary components and the network of relationships among the components may help explain the determinants of the risk appetite of each investor and her/his ability to control risky situations that may arise. It is very important indeed to recognize that the same elements contribute to entrepreneurial skills.

Suppose you have the ability to control a specific source of entrepreneurial risk. The better this ability, the more risk you can process per unit of return extracted and the lower your specific risk aversion. This ability does not guarantee that you have a similar ability to keep the related impacts of that item on all other elements under control. Accordingly, your superior ability to control one source of risk may have lower-than-expected relevance to the overall entrepreneurial business, since the network remains less affected than expected. Since the number of connections to all the other elements depends on the overall number of elementary components, it is highly probable that the ability to control the risk connections may be more efficacious than the ability to control one element. In other words, the entrepreneurial skills matter more than the

exogenous risks. An example may help explain the above concept. We know that entrepreneurs usually have great technological skills and are focused on innovation; however, they may be less competent in using their technological knowledge in other business areas, such as customer service. This helps explain why wonderful innovations remain at the seed stage without developing into successful businesses.

The points described above are critical to successful entrepreneurial business and financial transactions: focused skills make genius, while networking skills make successful entrepreneurs. An entrepreneurial finance transaction will be more effective when investors can help complete the overall business risk aversion and risk control, given the entrepreneur's strengths. At a practical level, investors commonly contribute to entrepreneurial businesses by providing both funding and their capabilities to control the networks of relationships, while the entrepreneur provides the capability to control one or more specific components of business risk. The financial transactions will help reduce the agency risks in the entrepreneurial business if the partnership permits honest exchanges between the network-controlling capabilities of the investors and the specific controlling capabilities of the entrepreneur.

A more formal treatment of this topic will be provided in the next section. We may anticipate the following regardless of the transaction: in an incomplete market, (i) it will be of the point-to-point type, and (ii) its success will be based on the completion of the entire set of controlling capabilities by the entrepreneur and the investors. Indeed, point-to-point risk aversion matching, for which we need alternatives to standard professional methods to detect both business risk and investor risk tolerance.

5 Certainty Equivalents and Financial Market Equilibrium: Lintner's CAPM

In standard corporate finance, the capital asset pricing model (CAPM) is widely used to determine a theoretically sound measure of the required rate of return for a company/investment given its risk. All approaches based on CAPM suppose that the asset is to be added to an already well-diversified portfolio, while the asset's level of risk is given, that is, it is exogenous. These models take into account the asset's sensitivity to non-diversifiable risk, namely, systematic risk or market risk, which is indicated in the financial industry by the investment's beta (often written β), as well

as the expected return of the market and the return of a theoretical risk-free (RF) asset. However, for private/unlisted companies, such as entrepreneurial business and SMEs, it is difficult to obtain betas and very difficult to estimate them soundly. Standard rating systems are essentially based on a neoclassical risk premium framework. Hence, true tradability for all assets (i.e., market completeness), or at least a considerable variety of comparable companies (i.e., market efficiency), must be supposed in order to estimate the beta. A very unrealistic hypothesis!

Lintner's 1965 insight helps in this regard, as he proposed the valuation of investments according to the CE, which avoids complex estimations of risk premia. In fact, in Lintner's approach, values are computed by discounting the expected return adjusted for its expected risk at the RF ratio. Lintner demonstrates that the CE approach can be used to assess and compare investments, since the resulting figures are fully compliant with Tobin's two-fund separation theorem. Accordingly, the market equilibrium that can be found through CEs leads to the same market values and capital allocations found through the CAPM and other market-based models. From a purely methodological perspective, CE computation may be much easier than risk-premium assessment for unlisted/private companies with limited numbers of comparable securities. However, you must consider that even the computation of CEs might be overly complex in the case of unlisted entrepreneurial businesses and SMEs. Thus, we propose a revised version of Lintner's original approach, which may be easier to exploit. Our model starts from the basic intuition used by Gardenal (2010), who attempted to apply Lintner's (1965) method to SME evaluation by measuring the expected return and its volatility. Diverging from Gardenal's proposal, however, we prefer to apply Lintner's approach very differently, following the bulk of the research developed by the Teofilo Intato Foundation since 2004.

In a standard neoclassical context, investors choose well-diversified portfolios located on the capital allocation line (CAL). The portfolios with the highest utility are selected given the risk aversion of a generic investor, as depicted in Fig. 3.1.

The above model supposes markets to be efficient and, above all, complete, that is, they are capable of expressing a value/price for any investment, including the one under investigation. Accordingly, values and risk aversion are discovered by referring to systematic risk alone and supposing that all investments are subject to a reasonable benchmarking process within the market itself.

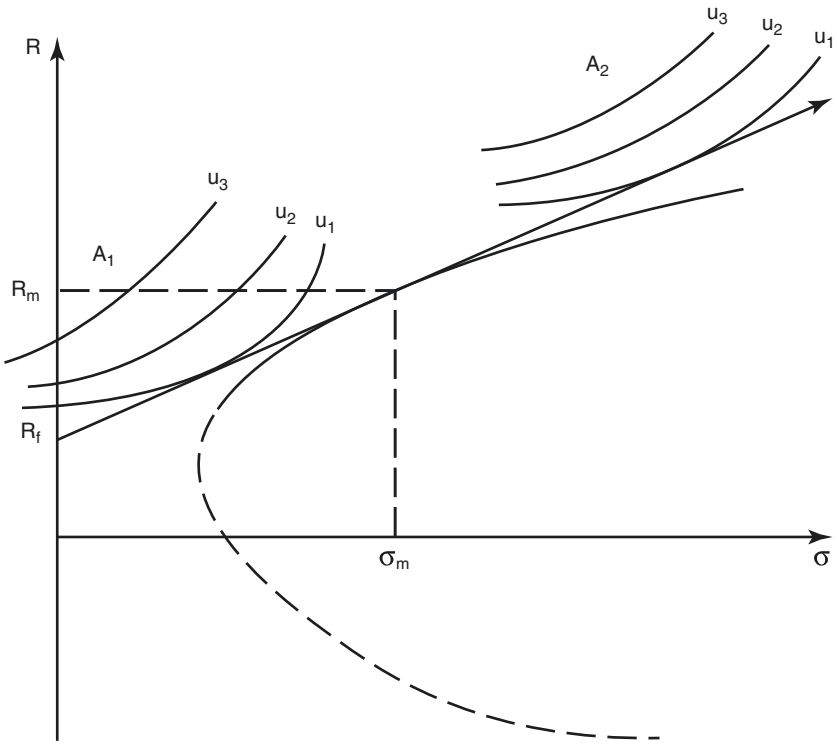

Fig. 3.1 CAL and investment choices depending on different risk aversion

Lintner's approach chiefly removes the requirement of market completeness to discover value by avoiding the estimation of the market risk premium for discount rates by referring to market data. This is possible since the CE of expected cash flows are discounted (at the RF rate) rather than the volatile expectations of cash flows (at a risky market rate). Moreover, it refers to a total-risk-aversion input to estimate the CE instead of adopting systematic risk aversion, as applied to a CAL portfolio's return-to-risk performance, which is used as a benchmark. This could not be otherwise given the elimination of the market completeness assumption. Finally, it is important to recall Lintner's demonstration that the final value assessment is fully compliant with market models, such as the CAPM.

Considering a generic investor's risk aversion (A, as in previous sections of this book) based on a classic quadratic utility function proposed by Von Neumann and Morgenstern (1953), the utility of investing in the i-th asset is described by Eq. 1:

$$U_i = R_i - \mathrm{A}\sigma_i^2 \quad [1]$$

where U_i is the achieved utility, R_i is the expected return rate, σ_i^2 is its volatility (variance), and A is a measure of the investor's marginal risk aversion, as explained above.

In Lintner's framework, the same level of utility could be achieved through a theoretical RF investment in an equivalent RF return (R_F^*) (i.e., an investment with the same value for me) given the same investor's risk aversion. Such a threshold is called the CE (Eq. 2):

$$U_i = R_F^* - A * 0 = R_F^* \quad [2]$$

Substituting Eq. 2 into Eq. 1 makes it easy to see that the CE equals the difference between the expected return and the portion of volatility that is related to the investor's specific risk aversion. If A>0, (i.e., the investor is risk averse, as in the CAPM and all other models based on second-order stochastic dominance) then R_F^* will be higher than the market RF rate of return. In fact, the gap between the two rates ($R_F^* - R_F$) forces the investor to prefer the risky asset given his/her specific degree of risk tolerance. Therefore, the higher the risk aversion, the wider the gap must be to convince the investor to fund the entrepreneurial business.

In a standard CAPM framework, investment appraisals are considered according to their marginal contribution to the return and risk of a well-diversified portfolio. This is why the relevant risk for the i-th asset is limited to the systematic component of its variance, as described in Eq. 3:

$$\sigma_i^2 = \beta_i^2\sigma_m^2 + \varepsilon^2 = \sigma_p^2 + \varepsilon^2 \quad [3]$$

where $\beta_i^2\sigma_m^2 = \sigma_p^2$ is the systematic risk of the i-th investment expressed as the variance of the returns, which equals the variance of a portfolio lying on the CAL with the same expected return, and ε^2 is the firm-specific risk.

Since there are no further addendums to the equation, this component is supposed to be independent from systematic risk.

As a consequence of Eq. 3, the investor's risk aversion (A) for the i-th investment is also composed of two parts: one related to the systematic risk (As) and one to assess the asset-specific risk (AƐ). Accordingly, the investor's utility (Eq. 1) can be re-written as in Eq. 4:

$$U_i = R_i - A_s\beta_i^2\sigma_m^2 - A_\varepsilon\varepsilon^2 = R_i - \mathrm{A}\sigma_i^2 \qquad [4]$$

Indeed, Eq. 4 clarifies that the investor's risk aversion can be conceived of as the weighted average of As and AƐ, supposing the stochastic independence of the two sources of risk (systematic and firm specific). Neoclassical theory gives no definitive proof regarding the relations among A, As and AƐ (Mantovani 1998). In fact, if the investor diversifies his/her portfolio such that diversifiable risk becomes irrelevant, then AƐ also becomes irrelevant while the relevant A approaches As. At the same time, the two-fund separation theorem holds that the expected return of the investment will converge to (produce the same utility as) that of a portfolio P composed of a mix of the market portfolio (M) and the (true) RF investment (R_F). Portfolio P becomes the benchmark against which to assess value of the i-th investment. The proportion of the components is such that portfolio P lies on the CAL with variance (σ_p^2) fully composed of the same systematic risk $\beta_i^2\sigma_m^2$ (since $\varepsilon^2 = 0$) as the initial investment. Accordingly, portfolio P is clearly composed of α parts of market portfolio M and 1-α parts of RF investment. Moreover, it must have the same utility as the i-th investment, i.e., the same CE, as Eq. 5 explains:

$$U_p = R_p - A_s\sigma_p^2 = U_i = R_i - A_s\beta_i^2\sigma_m^2 - A_\varepsilon\varepsilon^2 = R_i - A\left(\beta_i^2\sigma_m^2\right) = R_f^* \qquad [5]$$

Two interesting consequences arise from Eq. 5: (i) the irrelevance of diversifiable risk is related to the zero level of A_ε, supposing that systematic and diversifiable risks are independent; (ii) if the slope of CAL (i.e., its Sharpe ratio) is positive, no rational risk-averse investor fully allocates assets to RF investments, since any risky portfolio on the CAL has a higher utility/CE compared to the RF rate ($R_f^* > R_f$). As a direct consequence, the financial system is composed only of complete

markets and risk-averse investors (second-order stochastic dominance) and the market portfolio M is then determined according to Tobin's separation theorem.

Figure 3.1 clarifies that in establishing the expected return of a specific investment in a neoclassic framework, the slope of the CAL (the Sharpe ratio) must equal the linear transformation of the systematic component of the investor's risk aversion, as in Eq. 11:

$$S = \frac{E(R_m) - R_f}{\sigma_m} = \frac{E(R_p) - R_f}{\sigma_p} = 2A_s\sigma_p = 2A_s\beta_i\sigma_m \quad [6]$$

The expected returns of both the portfolio and the i-th investment may be found accordingly:

$$E(R_p) = R_f + 2A_s\sigma_p^2 = R_f + 2A_s\beta_i^2\sigma_m^2 = E(R_i) \quad [7]$$

In the CE context, the same expected return is determined by re-writing Eq. 5 as Eq. 8:

$$E(R_p) = E(R_i) = R_f^* + A_s\sigma_p^2 = R_f^* + A_s\beta_i^2\sigma_m^2 \quad [8]$$

Since both Eq. 7 and Eq. 8 determine the same expected result, we can set them equal to each other:

$$E(R_i) = R_f^* + A_s\beta_i^2\sigma_m^2 = R_f + 2A_s\beta_i^2\sigma_m^2$$

such that $R_f^* - R_f$ (the gap between CE and RF returns) may be exposed as in Eq. 9:

$$R_f^* - R_f = 2A_s\beta_i^2\sigma_m^2 - A_s\beta_i^2\sigma_m^2 = A_s\beta_i^2\sigma_m^2 \quad [9]$$

From an economic prospective, Eq. 9 tells us that the CE excess return is linearly related to the investor's risk aversion. Such a gap is also strictly related to the risk premia: since R_f^* is the investor's utility when markets are in equilibrium, we can rearrange the equation as in Eq. 10:

$$E(R_i) - A_s\beta_i^2\sigma_m^2 - R_f = A_s\beta_i^2\sigma_m^2$$
$$E(R_i) - R_f = 2A_s\beta_i^2\sigma_m^2 = 2\left(R_f^* - R_f\right) \quad [10]$$

Eq. 10 reveals that knowing the investor's CE makes possible the estimation of the consequent expected return for each investment and that the attractiveness of a specific investment can be defined according to the R_f^* level, as estimated according to a threshold risk aversion. Hence, by following the pure Lintner approach, we avoid the constraint of asset marketability but acquire that of risk-aversion assessment.

This tricky trade-off may have a solution in the adoption of a shortfall approach (Leibowitz and Henriksson 1989) within the framework proposed by Lintner to estimate the investment utility (i.e., its value). Instead of searching for the rigid CE, the proposal is to focus on the "**confidence equivalent**", that is to say, a minimum threshold according to a certain confidence percentage. The investor determines both the threshold and the confidence before selecting the investment, that is, ex ante. Eq. 11 explains the relationship between the expected return for a specific (i-th) investment and the confidence equivalent return (Rce), supposing 10% confidence for the overall market:

$$\begin{aligned} Rce &= E(R_i) - Z\sigma_i \\ E(R_i) &= Rce + Z\sigma_i \end{aligned} \quad [11]$$

where

$$Z = \int_{-\infty}^{10\%} f(x)dx.$$

According to Eq. 11, the investor's risk aversion makes her/him accept an ex post return below the Rce only once every 10 cases over the entire holding period of the investment. From this viewpoint, the investor's risk aversion is jointly reflected in the set composed of the confidence equivalent, the Rce, and the confidence level (e.g., 10%). It is important to note the difference between the approach proposed here and the classical concept of

risk aversion: in fact, the latter chiefly focuses on the return-to-risk ratio (usually at the marginal level), while the approach proposed here focuses on loss tolerance over the time horizon of the investment. This proposal is consistent with approaches supposing that downside risk erodes more utility than is generated by upside risk. Moreover, the proposed shortfall-based approach is more consistent with the cycle of entrepreneurial skill evolution and the function of time within the cycle.

All investments lying on the line described by Eq. 11 has the same characteristics that make them compliant with the investor's risk aversion. We call it the shortfall line (SHL) to compare it with the CAL. In complete and perfect markets, Eq. 11 must be compliant with the results of a standard utility analysis, $E(R_i) = R_f^* + A_s\sigma_i^2$, and with the CAL, $E(R_m) = R_f^* + S\sigma_m$ (where S is defined as in Eq. 6). This leads to Eq. 12:

$$Rce + Z\sigma = R_f^* + A_s\sigma_m^2 = R_f + S\sigma_m \qquad [12]$$

Eq. 12 suggests that the CAL can be thought as a special case of the SHL, supposing (i) confidence higher than 50%, since the S ratio is positive to support the investor's risk aversion, and (ii) a lower bound at the RF rate. This theoretical equivalence is possible because the joint conditions of market efficiency and completeness allow you to identify the RF investment. When the RF investment cannot be found, models such as Fisher Black's zero-beta model must be adopted to identify an expected return that can substitute for the RF rate and identify the market portfolio through the CAL (Black 1972). However, if you think carefully about such a model, the zero-beta return is indeed the Rce detected between the market portfolios on the efficient frontier, while the slope of the consequent CAL relates directly to the probability. Since it is the investor's risk tolerance that determines the ex ante shortfall, the threshold is a zero beta versus any investment; for the same reason, the slope of the line is constant in both Black's model and in the standard Capital Market Line.

Lintner's model is a specific case of this more general model. The market replicability of a zero-beta return through the efficient frontier is the framework adopted in Black's model to determine the downside threshold return without resorting to analytical estimation of the investor's risk aversion. If you miss the market replicability and accept the downside risk approach such that Z=A/σ, you may find that you no longer

need to trust in the Tobin two-fund separation theorem, neither do you need to search for the zero-beta investment in the market only. In fact, in the same way that Linter's CE of a specific investment moves toward the equilibrium depicted in the classic CAPM, the proposed confidence equivalent for a specific investor moves toward the equilibrium depicted in Black's zero-beta model.

Given the above framework, the investor's choices can be considered according to three approaches:

(a) $E(R_i) \geq R_f + S(\beta_i \sigma_m)$ (the standard CAPM)
(b) $E(R_i) \geq R^* + A{\sigma_i}^2$ (the standard Linter approach)
(c) $E(R_i) \geq R_{CE} + Z\sigma_i$ (the proposed shortfall approach).

From a theoretical perspective, the three approaches are equivalent if markets are working well, that is to say, if they are at least efficient and possibly complete. From a more practical perspective, the approach proposed here seems easier to adopt: no comparison peer group is required as in case (a), and no precise estimation of risk aversion (the substitution rate between risk and return) is needed as in case (b). In fact, for case (c), estimating the confidence equivalent of a specific investment, given an ex ante probability, is sufficient: the investment choice will be direct consequence of its comparison with the Rce computed for the overall market. This is a direct consequence of the ability to use case (c) even for incomplete markets, that is, for unlisted and private companies. This also means that any investor (either debt or share claimant) may resort to this approach given its specific Z score.

6 Valuing Capital Assets, Intangible Assets and Competence Assets

To complete these financial deals and take advantage of both entrepreneurial opportunities and financial markets incompleteness, the above methodological tools must be adapted to estimate the potential value of skills over the entire entrepreneurial cycle and to bypass the myopia that affects financial markets and intermediation. Comparing the standard methodologies to estimate competitive value with the method proposed here may be useful for identifying a practical approach.

The market value of a typical competitive corporation can be computed as the present value of expected (i.e., volatile) cash returns. Supposing a

steady-state firm (this assumption is made only to facilitate exposition of the model), the price computation is described by Eq. 12:

$$P = \frac{E(CF)}{k} \qquad [12]$$

where P is the market value/price of the company, E(CF) the expected level of cash flow, and k is the cost of capital.

If the corporation is competitive, its book returns r are expected to be above the k level:

$$P = \frac{E(CF)}{k} = BV\frac{r}{k} \qquad [13]$$

where BV is the book value of assets, and r is the corporate rate of return.

Their price-to-book-value ratio reflects the r-to-k ratio for any given level of systematic risk:

$$\frac{P}{BV} = \frac{E(CF)}{BVk} = \frac{BVr}{BVk} = \frac{\mathbf{r}}{\mathbf{k}} \qquad [14]$$

Notice that r is a *book* (not a market) rate of return.

Given a certain level of risk, the market value will be higher than the book value (i.e., goodwill exists) if the corporate rate of return is higher than the cost of capital (i.e., profitability is observed). The market value of goodwill is exposed in Eq. 15, which still considers a steady-state business:

$$G = P - BV = BV\left[\left(\frac{r}{k}\right) - 1\right] = BV\frac{r-k}{k} \qquad [15]$$

where G denotes the *market* value of goodwill.

Let us now consider the case of an entrepreneurial venture, which has a similar competitive initiative as the previous company in addition to grafted skills. In complete markets, the cost of capital k is the same as that of the competitive company, since the firm-specific risk is not relevant (see the above sections).

In the E-seed and E-pullulating phases, smaller expected cash flows are generated until the grafted competence is fully incorporated into the firm. This lower value can be estimated according to Eq. 11bis:

$$W_1 = \frac{[E(CF) - E(X)]}{k} = BV\frac{r-x}{k} \qquad [12bis]$$

where W is the *estimated* (i.e., fair but not market) value of the entrepreneurial business, E(X) the expected yearly investment required for competence pullulating, and x is the ratio of E(X) to the book value of the company.

Should the E-seed phase continue, the price-to-book-value ratio would reflect the (r–x)-to-k ratio:

$$\frac{P}{BV} \to \frac{W_1}{BV} = \frac{[E(CF) - E(X)]}{BVk} = \frac{r-x}{k} \qquad [14bis]$$

If x is positive, W_1/BV will appear lower than the fair P/BV! In fact, if successful, competence dissemination into the corporation would generate higher returns to risk after t years. In other words, the E-pullulating stage would begin and tend to complete the value.

The missing value at time zero can be described as in Eq. 12ter:

$$W_2 = \frac{\frac{p}{(1+k)^t}E(X) + E(C)}{k} \qquad [12ter]$$

where p is the probability of entrepreneurial success, E(C) the excess cash flow due to competence at work, and t is the time required to disseminate competence (i.e., the duration of the E-pullulating phase).

The missing price-to-book value at time zero will be:

$$\frac{W_2}{BV} = \frac{\left[\frac{p(\mathbf{x}+c)}{(1+k)^t}\right]}{k} \qquad [14ter]$$

where p is the probability of entrepreneurial success; c is the excess return generated by competence at work (=E(C)/BV), and t is the time required to disseminate competence (the duration of the E-pullulating phase).

The gap between the value of the competitive company (P) and the complete value of the skilled company (W_1+W_2) depends on the relationships among c, x, p, k and t and on the entire set of determinants of W_2/BV. Eq. 5 indicates the conditions for $P = W_1 + W_2$:

$$c\frac{p}{(1+k)^t} = x\left[1 - \frac{p}{(1+k)^t}\right] \qquad [16]$$

If the entrepreneurial project is successful (the firm proceeds to the E-completing stage), W_2 is transformed into a market value, thus regenerating the missing value (including goodwill). **W_2 is the estimated *competence value*.** Revealing the hidden value requires a complete entrepreneurial cycle.

One can now better see the difference between goodwill and competence value discussed above by comparing Eq. 12 with Eq. 12bis. Generally speaking, $P \geq W_1$ because it embeds the option to access W_2. In fact, according to Eq. 15, we can conclude that:

$$P - BV = G \geq W_1 - BV \qquad [15bis]$$

and that:

$$G \neq W_2 \qquad [17]$$

Competence value is indeed different from *goodwill value*! The equations clearly represent very different economic concepts – the contents and drivers – of G and W_2. More importantly, one can argue about the dramatically different *functions of time* in the competence value case and in the goodwill case discussed above: for goodwill, time is an instrument of value measurement only (i.e., it is used to calculate a present value); for the competence value, time underpins business success filtered by the probability p (i.e., it must complete the capital accumulation process).

Based on the previous equations, the similarities between the theory of incomplete financial markets and that of entrepreneurial business mechanics are clearer. W_2 is the hidden value that could emerge from entrepreneurial behavior (i.e., the expertise quota of funding), whereas P_0

(or W_1, depending on the level of market efficiency) is the current market value that could encourage investors to finance entrepreneurial ventures (i.e., the capital quota of funding). At time t (when the competence cultivation cycle is completed), P_t could be particularly high if the company truly enters the E-completing phase.

Lintner (1965) demonstrates that (i) you can determine the value by discounting the CE of cash flows using the RF rate (R_f) and that (ii) the result is exactly the fair price you can find using market models. Thus, we present the following equation[1]:

$$\frac{E(CF)}{k} = P = \frac{CE}{R_f} \qquad [12quater]$$

where CE is the certainty equivalent of E(CF) and [CE<E(CF)], and R_f is the risk-free rate, $[R_f < k]$.

Consequently:

$$\frac{CE}{E(CF)} = \frac{R_f}{k} \qquad [18]$$

or

$$CE = E(CF)\frac{R_f}{k} \qquad [18bis]$$

All previous computations can made relative to the book value and compared with Eq. 13 such that the following equation can be written:

$$\frac{r}{k} = \frac{P}{BV} = \frac{r^*}{R_f} \qquad [19]$$

where r* is the *book* return rate based on CE (=CE/BV), and R_f is the risk-free rate.

You learned in previous sections that the main difference between Lintner's approach and complete market approaches (such as the CAPM) is methodological. A bottom-up approach does not require market equilibrium to determine prices; no link is required between price discovery and the market

equilibrium, as the CAPM obliges the analyst to detect peer groups as part of the corporate valuation process. The complexity of estimating the risk premium is substituted by that of CE estimation. We suggest that in incomplete markets, Linter's bottom-up approach can reduce bias and information risk and, eventually, the perspective gap. This is because the analysis concentrates on the corporate level and prevents mistakes in extracting market-related indicators in incomplete contexts.

We can usefully merge Lintner's approach with the previous entrepreneurial business concept to identify the confidence equivalent approach proposed here. In Lintner's approach, both the price P and value W are based on the same CE; further, the condition for market completion, $P = W_1+W_2$, allows the following equation to be true:

$$CE = \left\{ [E(CF) - E(X)] + \frac{p}{(1+k)^t} [E(X) + E(C)] \right\} \frac{R_f}{k} \qquad [18ter]$$

It is particularly important to note that the previous equation uses only book data to estimate the values, that is, it uses the same data widely used in financial statement analysis. The previous equation can also be written in terms of the book value as follows:

$$\frac{W_1 + W_2}{BV} = \frac{(r - x) + \left[\frac{p}{(1+k)^t}(x + c)\right]}{k} = \frac{r^*}{R_f} \qquad [19bis]$$

At the industry level, r* (the book CE threshold to be compared with the R_F^* required by the investor) can be estimated using a shortfall approach (Leibowitz and Henriksson, 1989). The joint distribution of r, x and c is then used to determine r* given a confidence level estimated based on the basics of entrepreneurial business success: p and t. Thus, the competence value can be estimated using the bottom-up (corporate/industry-level) estimation of r*:

$$r^* = i{-}SHF + N(\phi)\sigma_i \qquad [20]$$

where i-SHF the shortfall level of return at a φ confidence level, σ_i the standard deviation of the *book* return rate for the i-th investment, and $N(\phi)$ is the standardized normal distribution figure given a fixed confidence level.

In Lintner's approach, however, the value estimations through CE must reflect the average risk aversion of investors, which means that the market shortfall computation should generate the same numeric result. The numeric result of Eq. 20 should be validated by comparing it to market conditions. A market level or r* can be estimated using the distribution of market returns (k) based on the market evidence of risk aversion. Thus, a top-down confirmation of the competence value estimation can be made using market data:

$$k^* = m{-}SHF + N(\phi)\sigma_m \qquad [20\text{bis}]$$

where m-SHF is the shortfall at a ϕ confidence level, σ_i is the standard deviation of returns for the entire market, and $N(\phi)$ is the standardized normal distribution figure given the same fixed confidence level.

In equilibrium, r* = k*. In fact, according to Lintner's hypothesis, Eq. 21 should be true:

$$m{-}SHF = i{-}SHF \quad \forall i; \forall \phi \qquad [21]$$

Once you have a confirmed the estimated r*, you can validate W_2 and verify the actual capability of the industry/company to override the k* threshold *over a time horizon based on the confidence level*, thus applying Eq. 8 bis as an indicator of persistence. Please note that the use of confidence estimation for the shortfall level is consistent not only with the persistence required for the competence value's existence but also with the value-at-risk approach adopted in Basel-related risk measurement systems. Setting the shortfall confidence implies knowing the average risk aversion of the market. In the case of Basel risk measurements, the shortfall level is 1%, which means that is the average risk aversion in the market and that this level of risk aversion will never change! In Linter's approach, however, risk aversion is not a determinant of the model, since the resulting price is the same as that obtained by Tobin's (1958) two-fund separation theorem. The estimation of a specific risk aversion is then useful for detecting the policy preferences of a specific investor or entrepreneur but not the equilibrium policies.

Supposing that the book value overlaps the so-called "reconstruction" level, we can use the price-to-book-value ratio as a proxy for Tobin's Q

at the corporate level. In incomplete markets, the Q ratio misses W_2 because it does not consider the value-to-price gap endogenous to incompleteness. A parallel ratio of W_2 to the book value can be estimated by subtracting the Q ratio from a similar indicator estimated based on our amended Lintner approach. In honor of the entrepreneurial spirit of Teofilo Intato and of the eponymous Foundation that supports this research program, we call this the **T ratio**. Accordingly, the Q and T ratio can be theoretically computed using the following formulas:

$$Q = \frac{W_1}{BV} = \frac{r - x}{k} = \frac{r_i}{k} \quad [22]$$

$$T = \frac{W_2}{BV} = \frac{\frac{p}{(1+k)^t}(x + c)}{k} \frac{r^*}{k^*} \quad [23]$$

According to Eq. 8 bis in section 3.f, $Q+T = r^*/R_f$, and the T estimation can be confirmed through Eq. 24:

$$\hat{T} = \frac{r^*}{R_f} - \frac{r_i}{k} \quad [24]$$

The T in Eq. 23 can be estimated through $\hat{T}$ in Eq. 24, which is the core of the Teofilo Intato method of competence value measurement.

7 Value Estimation Techniques Across E-phases

The key point you must understand in order to conduct sound entrepreneurial value estimation is the following: avoid the forward-looking approach that is usually adopted in financial and business forecasting. In such an approach, the business profiles depicted start from the present situation/framework and describe the possible scenarios that may arise, all of which use the starting point, that is, the present framework, as a determinant of the forecasted financial evolution and performance. When making projections for an entrepreneurial business, the opposite approach is more reasonable. First, you must determine the final result that may be achieved; second, you must use backward induction from this potential result to the present. The conceptual framework is the same as that explained in the Luxottica example above.

This permits a better understanding of the feasibility of the enterprise challenge, producing a clearer picture of the probabilities of passing through the different stages of the entrepreneurial cycle. In fact, for each of the three stages, a backward induction exercise will be required, helping to clarify the assessment of the probability of progressing from one stage to another. As we know, this probability is key to determining the W_2 component of the entrepreneurial business. While using backward induction from the simulated steady-state to the present, the relative weight of the W_2 component of the overall business value will increase. The consequent reduction of the W_1 component means that the capital quota (see the previous sections) or the unhedged capital grows larger (Minsky 1982), and more risk-tolerant capital is required in this phase of entrepreneurial development. This could lead us to conclude that only speculative capital will be willing to support the initial phases of the entrepreneurial business cycle because of the higher risk generated by the probability boundaries between each stage. By using backward induction to create an entrepreneurial plan, you will understand that the value of the initial phase is hedged by the persistent payoffs of the overall business and their volatility. Accordingly, the ability to attract capital, even in the initial phases, is related to the true existence of such persistent returns, while the ability to control their volatility can support long-term entrepreneurial success. Accordingly, investing in the two initial phases does not require speculative/high-risk-tolerant investors, but pickers/investors who have superior detection abilities for persistent return-to-risk profiles among entrepreneurial businesses and better opportunities to contribute to its control.

Option-pricing theory can be very useful in solving puzzles related to planning and forecasting entrepreneurial performance. In fact, the central weakness of the forward-looking approach originates from referring only to the mean-variance framework to determine financial choices. When a mean-variance approach is adopted, you are working in a second-order stochastic dominance framework; this is suitable if and only if personal risk aversion is irrelevant and general market risk aversion matters. Accordingly, you are extrapolating based on the idea that the future will be very similar to the past and that discontinuities reflect noise rather than opportunities. Indeed, this approach stems from the extensive use of mathematical and statistical tools in business economics, which are possibly adopted to avoid deeper conceptualization of the business mechanics of any firm; a very lazy approach, which supposes that rigorous methods outclass human capabilities to understand economic facts, and an strange view of the roles of minds and tools in

business economics research that possibly marks the path to their end. Conversely, using a first-order stochastic dominance approach produces sounder results, even in mean-variance modeling, as Friedman and Savage (1948) and Arrow (1971) demonstrated. Accordingly, the state-preference framework and the option pricing model (its basic application) help produce more sensible plans for entrepreneurial businesses. Nevertheless, each phase will need specific approaches.

The unhedged capital invested in the E-seed phase can be considered a special type of binomial real option, where pass or fail are the two possible scenarios. The maximum amount of capital invested in the phase equals the fair value of the binomial option. Accordingly, to create a sound plan, you must know the business value you could achieve with successful passage to the second stage. The returns and volatility over the entire cycle are much less relevant.

During the E-pullulating phase, capital is increasingly hedged. While the hedged quota generates cash flows that can be estimated using standard techniques, it remains of the upmost importance to detect the investments that can be made as part of the pullulating process within the organization. We know from the previous sections that the pullulating process is based on the efficient transmission of knowledge first to a team then incorporation into the corporate structure. The value of the entrepreneurial business in this stage can be considered the sum of two components: the standard value and a real option on progressing into the third phase. While the standard component can be estimated by discounting the skill-contingent cash flows that will be generated during this phase, the option component can be rationalized as a call option on the value of the entrepreneurial business at the beginning of the third stage.

At the beginning of the E-completing phase, the company value can be estimated using standard valuation tools, such as the discounted cash flow method. One of the biggest challenges is the identification of the correct path of the growing free cash flows during this phase, since they should grow based on previous skill accumulation and diffusion efforts. It is less difficult to imagine the steady-state value of the corporation at the very end the entrepreneurial business cycle; this represents the terminal value of the valuation process at the beginning of the E-completing stage. The second challenge is the identification of the correct risk premium to include in the discount rate to correctly consider the information and liquidity risks. Even if we suppose that there is no impact on company cash flows, resolving the information and liquidity risks during the E-

completing phase creates value since the discount rate will decrease with the reduction of the embedded risk premia.

Accordingly, the backwards induction estimation process reveals the following path:

- Estimate the value of the situation at the end of the scheme, that is, at the conclusion of the entrepreneurial cycle. You may use standard valuation techniques once the scenario has been identified.
- Use the above estimation as the terminal value of a discounted cash flow computation that adopts discount rates inflated by information and liquidity risk premia.
- The risk premia can be estimated by projecting higher cash flows during the E-completing phase. In fact, the higher the rate of growth and the riskier the cash flows, the larger the rates used to assess the value at the beginning of the phase.
- The above initial value is the underlying asset value that identifies the exercise of the real option embedded in the pullulating process of the second stage. Accordingly, it will permit the estimation of the option value at the very beginning of the E-pullulating phase even if the lengths of the phases must be considered so that a range option values can be found (this is a direct consequence of an economic function of time that differs from the normal one discussed above).
- By summing up the value of the option and the discounted cash flows from the second stage, you will be able to assess the value in the event of successful completion of the E-seed stage.
- This will permit the estimation of the fair value of the real binomial option that provides the economic incentive to invest in the entrepreneurial business at the very beginning of the entrepreneurial business cycle.

While the above steps might support business planning projections, the T ratio synthesizes the process by estimating the long-run sustainable rate of return (r^*) during each phase of the entrepreneurial business cycle.

NOTE

1. A steady–state company is supposed to facilitate understanding and to continue the previous exposition.

CHAPTER 4

The Return-To-Risk Profile of Investing in a Competence-Driven Business

Abstract A successful entrepreneurial finance transaction aims to transform the overall value ($W = W_1+W_2$) of the entrepreneurial challenge into market price. To ignite the investment, the return-to-risk profile of any entrepreneurial investment needs to be perceived in full. Since the relative weight of the two value components evolves during the overall entrepreneurial cycle, the return-to-risk profile evolves too. Therefore, an adaptive risk tolerance is required to hold the investment during the overall cycle. The relevant risk refers to both the quantity and the quality of the business risk. The chapter explains how to infer the contribution of the different components of the corporate risk; this helps the entrepreneurial finance deals to match at best the investor's risk aversion profile with that required by the entrepreneurial business.

Keywords Expected persistency of performance · W = W1 + W2 · Dorporate risks · Market risks · Operating leverage · Price leverage · Governance and entrepreneurship

We saw from the previous chapters that any entrepreneurial investment can be considered a bundle of components (the visible value (W_1) and the hidden value (W_2)), while a successful entrepreneurial finance transaction aims to convert the overall value ($W = W_1+W_2$) of the entrepreneurial challenge into a market price. You should also understand from previous

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_4

chapters that W_1 is a candidate for the current market price but that W_2 must be fully considered for a sound appraisal of the entrepreneurial finance investment. The return-to-risk profile of any entrepreneurial investment depends on the actual contributions of the two components.

1 The Return-To-Risk Profile of the Emerged (W_1) Value

The W_1 component is generated by the short-term replicability of the payoff produced by the investment, no matter who is in charge of managing the business. Accordingly, its average dimension and embedded risks are chiefly determined by exogenous elements, such as the economic cycle and technological standards. Idiosyncratic risk exists in the business but is of minor relevance here, since it can be safely diversified away by investors and, thus, not included in the computation of the risk premium for the corporate cost of capital. Similarly, the payoffs derived from competences are considered "one-shot" returns with low replicability and minor effects on market prices.

In the early stage of the entrepreneurial business cycle, W_1 is typically a very small component of the overall value. In fact, the payoffs are below standard, and payments into entrepreneurial initiatives are considered sunk costs, depressing the expected sustainable cash flow. The commitment to sustaining the entrepreneurial effort contributes to the perception that the sunk costs are fixed. This creates an operating leverage effect that may affect the perceived volatility of the forthcoming payoff.

An example may clarify the above situation. Suppose that a business has a standard payoff of 100 euros; being replicable, it is considered a perpetuity. The volatility of the payoff is 20% of its expected value, depending on the financial market conditions and the covariance of the standard payoff in the market, and the applicable discount rate for such volatility is fixed at 10%. Clearly, the financial value is 1000. Now, suppose that part of the payoff, for example 40, is used to fund the entrepreneurial business. This reduces the expected payoff from the perpetuity to 60, depressing the financial value of the company. In the meantime, the payoff volatility also changes; in fact, while the absolute volatility still stems from exogenous components of the standard payoff, that is, 20 (=20% × 100), the relative component increases to 33% (20:60). It is unrealistic to suppose that this will not impact the

discount rate, since the perceived exogenous risk is now amplified by an endogenous choice of the firm. Any increase in the discount rate will depress the market price below 600, which is the threshold computed in the case of no impact on discount rates, (i.e., 60/0.10). Should the discount rate increase to 12%, the value would drop to 500 euros.

We can conclude that the presence of an entrepreneurial challenge within a business tends to depress the W_1 component of the firm value in two ways: it reduces the payoffs and increases the risks. The more the W_2 component is hidden, the more the outflows of the entrepreneurial business are considered sunk, providing no opportunities to recover the investment and depressing the current W_1 component of the overall value. Accordingly, we may expect that W_1 will affect the evolution of the entrepreneurial lifecycle. In fact, transitioning through each stage will reduce the risk to recovering the outflows from entrepreneurial support. This is a dual effect: the first relates to the higher payoff, the latter to the reduced risk premium; therefore, the increase in W_1 during the cycle will be steep.

2 The Return-To-Risk Profile of the Hidden (W_2) Value

W_2 is the core component of the overall value of an entrepreneurial company. As we have seen in previous chapters, the entrepreneurial dynamics of the business are seriously affected by this component of overall value. The nature of W_2 changes across stages of the entrepreneurial cycle by altering both the payoff and the embedded risks. Discussing the return-to-risk profile of the W_2 component of the entrepreneurial value means discussing what happens in each stage and during the transition from one stage to another.

The **E-seed** phase focuses mainly on skill accumulation. This means that capital investment in this phase is very limited. The largest investment is made in human capital to permit the entrepreneur to complete know-why accumulation. The risk profile in this phase is typically binomial: pass or fail at the end of the stage. If the stage is successfully completed, you have an opportunity to recover the money spent to fund the entrepreneurial enterprise during the first stage; otherwise, failure results in the loss of the total amount.

The option-pricing model goes a long way toward solving the valuation puzzle at this stage of the entrepreneurial cycle. In fact, we may consider this stage a particular binomial (real) option, which matures at the beginning of the first stage. The option generates two possible payoffs: in the case of success, the payoff equals the value of the entrepreneurial business at the beginning of the second stage; in case of failure, the value will be zero. By referring to binomial models for option valuation, you do not have to estimate the volatility within the specific period. This is a considerable simplification from the very practical perspective of seed investors. In fact, the value of a binomial option is discovered through an arbitrage process based on a replicative portfolio composed of a long position on the underlying asset and leverage. The leveraged amount must be determined according to the worst-case scenario in order to keep it risk-free; in fact, by selling the asset in such a state of nature, you should still be able to recover capital and interests. Therefore, the value of the call is determined by comparing the gap between the underlying asset value in the upside and downside scenarios and the gap between the two payoffs of the call. This determines an equilibrium to which probabilities of the two scenarios have to be assigned.

An example of binomial option pricing may clarify its application to an entrepreneurial business. Let us consider an asset with a current price of 500 and two possible scenarios: in the upside scenario, the asset value increases to 1000 (up multiplier u = 2); in the downside scenario, the asset value decreases to 100 (down multiplier, d = 0.2). You may trade call options on this asset with a strike price of 200. Accordingly, the payoff of the call will be 800 in the upside scenario and 0 in the downside scenario. For the length of time to maturity of the option, the overall RF rate is 10%. We can discover the maximum amount of money paid to acquire the call as follows:

1. First, we compute the ratio indicating how many options replicate the performance of the underlying asset. Such a ratio is usually called the “hedge ratio”. It is computed as the ratio of the two possible payoffs of investing in the underlying asset to those of investing in the option as follows: (1000–100)/(800–0) = 1.125. In fact, if you go long on the asset and short on 1.125 call, you will obtain the RF payoff: 1000–800×1.125 = 100 for the upside scenario and 100–0×1.125 = 100 for the downside scenario.

2. Being risk free, the present value of the payoff of the above portfolio (90.90 = 100/1.10) must equal the current market value of the long-asset/short-call bundle proposed above. This equation uses the figures from the example, except for the call: 90.90 = 500 – 1.125c.
3. We can now solve for c and find that c = 363.64.

Given the figures in the above example, you understand that the fair value of the option does not depend on the probabilities of the binomial tree. Regardless, binomial option-pricing theory allows us to compute implicit probabilities for the tree, supposing a risk-neutral investor, as follows:

$$p(upside) = \frac{(1 + r_f) - d}{u - d}$$

In the previous example:

$$p(upside) = \frac{(1 + 0.10) - 0.2}{2.0 - 0.2} = 0.5$$

In fact, the expected value of the option payoff equals the call value (800×0.50 + 0×0.50)/1.10 = 363.64.

The above example can be posed an entrepreneurial challenge in the seed stage, where 363.64 is the maximum amount of money invested in the seed stage. The payoff at maturity of the call is the value at the beginning of the second (pullulating) stage of the entrepreneurial cycle (upside scenario) or the liquidation value of the business (downside scenario). The value of the call represents the maximum amount of money that you would invest in entrepreneurial skilling during the first stage, where the underlying asset represents the investment in the case that does not require entrepreneurial cultivation, and the strike price is the contribution to be given at maturity to the entrepreneur for their effort during the first stage. In the case of a successful first stage, the overall investment is 563.64 (i.e., 363.64+200 – the strike price of the option – which is greater than the initial value of the underlying asset), while the asset value in hand is 1000. In the case of failure, the value of the call evaporates, and the entrepreneur receives no economic benefits. You can easily understand that two items related to agency conflict may arise in an entrepreneurial

finance transaction during the E-seed stage: the negotiation of the strike price of the option and the sharing of value in the case of success. Two more topics must now be considered:

- The ***duration*** of the cycle seriously affects the financial break-even point of an entrepreneurial finance transaction. To understand this point using the above example, consider the case in which 363.64 is invested, and the length of the E-stage doubles. Since the RF return is for the overall period, this means that the 1.1 figure in the previous example increases to 1.21 ($=1.1^2$). The present value of the hedged payoff decreases to 82.64 ($=100/1.21$) from the previous 90.90 ($=100/1.10$), and the value of the call increases to 370.98 from 363.64. Accordingly, the marginal investment that can be tolerated (+2%) is far from double the time imposed by true management of the entrepreneurial challenge. This may help explain why many entrepreneurial finance transactions require the investor to provide the business with both qualified knowledge and financial support.
- The ***implied probability*** of the upside scenario also increases with the maturity of the option/E-stage to $p(upside) = \frac{(1+0.21)-0.2}{2.0-0.2} = 0.5611$. This means that a longer stage requires an increase in the probability of success. Thus, extending financial support to an entrepreneurial business requires that such financing will reinforce skills and increase the probability of success.

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The **E-pullulating** phase focuses on increasing the productivity of skills and on sharing know-how with the firm organization. This is the phase where the "behavioral risk" proposed by Yazdipour (2011) increases the regular "payoff risk" of the business. The two components of entrepreneurial risk in this stage may be correlated and need to be addressed individually, since they also contribute to returns.

When the entrepreneurial business enters this stage, a considerable share of start-up risk has been solved in the previous stage. Accordingly, return volatility becomes more strongly correlated with exogenous sources of economic risk. In the meantime, if skill accumulation was truly successful, its productivity should make a greater contribution to corporate profitability: profits usually surpass the benchmark level (i.e., the corporate

cost of capital) but depend on skills. The typical profitability trend allows large excess returns at the very end of this stage, which in turn attracts investors and allows the entrepreneurial business to proceed to the final stage of the cycle.

The greater profitability you may observe in this stage may hide a source of vulnerability: it is still person-specific, meaning that this profitability exists because of the coexistence of the bundled components (i.e., human skills and capital assets). Should the entrepreneur leave the business during this stage, excess profits would disappear if organizational changes had not been introduced in the meanwhile: this is a behavioral risk (stemming from the entrepreneur). The integration of competences into an organization requires monetary investments. This situation is very similar to that of the previous stage, but it differs in that the money is directed toward a team rather than toward a specific person and in that it can be internally funded through excess profits. The use of such excess profits to finance skill transfer clearly signals the entrepreneur's intent to share her/his capabilities with the organization – a positive sign with regard to the agency problems that may arise during this stage. The more sound the skill contribution, the lower the return volatility (both absolute and relative to the financial market); however, this does not imply a reduced discount rate, since the final embedded risk premium will include both the reduced systematic risk premium and the higher premium due to the agency risk (or behavioral risk) that characterizes the business. In fact, this stage faces a high probability of non-completion, that is to say, the return-to-risk profile of the company remains excessively person-related. In fact, there is considerable empirical evidence of high-performing companies that have been unable to progress to the next stage of the cycle because agency problems due to behavioral risk are not solved.

As in the previous stage, we may define the risk profile of the second stage as a bundle consisting of a chain of (real) binomial call options and a competitive managerial company. Again, option-pricing theory can help us solve the puzzle, since we know that an option can also consist of a chain of binomial options. The entrepreneurial process of skill diffusion into the organization can be compared to a typical American call option, with a continuous opportunity to exercise the option but a continuous risk of incorrect exercise that stops the process of skill diffusion and may reverse it.

This conceptual framework indicates that the following are the two key points of this stage:

- The persistence of corporate performance. Even if firm performance is sustained by superior knowledge accumulated during the first stage, investment in its pullulation depresses free cash flows to the firm and put them at risk through the continuous possibility of missing the option exercise (the chain of binomial options).
- The duration of the process. The process of skill diffusion has a high risk of reversal, which further increases the duration of the E-pullulating stage. This has large financial consequences for both the present value of cash flows and the risk of investing. This key point is strongly connected to the previous one, since persistent performance permits the use of funds to sustain the duration of the stage; otherwise, new external funds will have to be collected.

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In the **E-completing** phase, the transformation of the entrepreneurial business into a more managerial company is nearly complete, at least at the operating level. Company performance is increasingly independent from the personal skills of the entrepreneur and more strongly related to the corporate hierarchy. At this stage, the risk profile of the investment chiefly relates to the liquidity and information risks embedded into negotiations over corporate securities. If the skills accumulated during the previous stages work properly in the corporate framework, stronger performance (higher returns with lower volatility) should improve liquidity and reduce information risk. In this stage, the degree of financial market efficiency may severely affect successful stage completion. Standard private equity practices may be important to the successful resolution of this stage.

3 The Level of Risk Aversion Required to Invest in Hidden Value

Risk aversion/tolerance is among the most complex topics in applied finance due to the subjective elements that characterize it. In very general terms, risk aversion is a preference to avoid risk; consequently, an economic incentive must exist to bear a risk. Conversely, risk tolerance is the

reciprocal of risk aversion, namely, T = 1/A. From a semantic perspective, the concept of risk aversion describes a preference to avoid risk, while risk tolerance emphasizes the ability to face the consequences of risk.

We know from previous chapters that financial theory prefers a relative risk aversion concept; in other words, it considers risk aversion as the ratio of marginal changes in the variance of returns and the required adjustment in investment returns. The larger the ratio, the more risk-averse the investor. The adoption of this concept of risk aversion is strongly related to a mean-variance approach to modeling financial market equilibria and risk premia. Theoretical finance suggests that a pure mean-variance approach to equilibrium is successful only if specific conditions are satisfied, including a generalized investor risk attitude and a generalized normal distribution of investment returns. From a statistical perspective, two conditions permit the adoption of a second-order stochastic dominance approach to ranking investments.

According to this approach, downside risk (i.e., returns below expectations) is more relevant than upside risk; therefore, a risk premium must be added to compensate investors (Fig. 4.1).

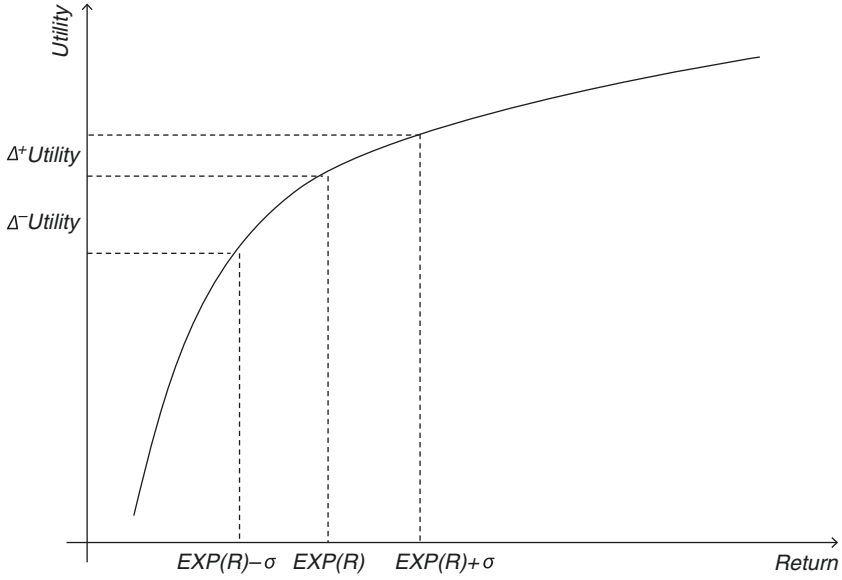

Fig. 4.1 Utility, expected returns and volatility

As Fig. 4.2 illustrates, greater volatility may reduce the investment ranking given invariant returns.

It is difficult to meet all the conditions required for generalized second-order stochastic dominance in real markets. In fact, the normal distribution condition is not met in several cases, as in for example option-style derivatives and entrepreneurial finance transactions, and investors rarely seem to exhibit generalized risk aversion. This is why a considerable body of research into alternative asset pricing models has developed, typically by referring to arbitrage solutions that are based on first-order stochastic dominance to rank the investments. Arbitrage-pricing and option-pricing theories are typical examples. More recently, behavioral finance studies tend to broadly confirm the considerable difficulty of using second-order models based on a mean-variance approach.

We learned from previous chapters that entrepreneurial finance transactions are based on very specific risk profiles, including behavioral topics. The similarities with options were highlighted for the phases that compose the entrepreneurial cycle, thus supporting the requirement of a more

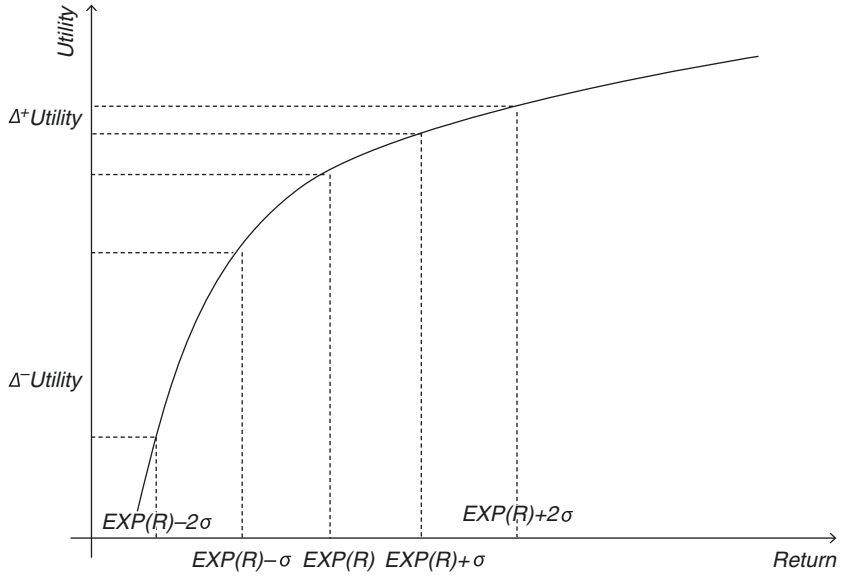

Fig. 4.2 Risk increase and utility changes

sophisticated approach to risk aversion/tolerance. In entrepreneurial finance transactions, risk aversion must be considered a multivariate relation that refers to the multiple drivers of entrepreneurial success that affect financial returns and their evolving volatilities, namely, skills and their accumulation at the personal and team levels, as depicted in Chapter 1. Since time is the key element that permits the successful conclusion of the entrepreneurial cycle, we must now focus more on its relations with investor risk aversion/tolerance.

Long investment horizons tend to smooth risks and make riskier investments (such as stocks) more attractive than less risky ones (such as bonds). This is particularly true if yearly returns are independent of each other, even if they are uniformly distributed. In fact, in this case, the return-to-risk ratio tends to increase over time, since the numerator will grow more rapidly than the denominator of the fraction due to the deployment of the excess returns to compensate for risk premia. From a mathematical perspective, returns are linearly correlated with time, while the standard deviations are linearly correlated with the square root of time; accordingly, the ratio tends to increase on the square root of time, as theories of time diversification in investing suggest. This approach is difficult to adopt in entrepreneurial finance transactions because the entrepreneurial cycle does not allow us to assume that the return distribution and elapsing time are independent. This is because time is no longer a simple measurement tool, as in standard corporate finance, but an economic driver that permits the unbundling of human skills and their productivity from the overall corporate structure.

We know from Chapter 1 that time has two main effects on entrepreneurial business performance: on the one hand, it develops an exponential path of corporate returns versus a benchmark according to the increased contribution of skills. On the other hand, the behavior of the entrepreneurial team approximates an option chain that allows either transition to the next stage or reversal to the previous stage (if not abortion of the investment). We previously discussed the effects on the return-to-risk profile of the entrepreneurial finance investment, so it should be clear that we cannot use a risk aversion measure based on generic expected returns and volatilities. A more effective measure of risk aversion for entrepreneurial finance transaction should be based on the persistence of entrepreneurial performance throughout the entire cycle. This requires the joint consideration of yearly returns computed over the entire entrepreneurial cycle and the true confidence that continuation is possible. The

adoption of a confidence estimation of shortfall is consistent with these requirements: the investor must clarify her/his aversion through the shortfall or returns and the confidence percentage to accept lower returns over the time horizon of the investment. Previous sections have already discussed this topic. The selection of the quality of risk is also important: the point-to-point model that characterizes entrepreneurial finance transactions allows the selection of the level of risk aversion that drives each investment.

4 The Determinants of the Return-To-Risk Persistence of Firm Performance

A recent survey on corporate risk (C-risk) management depicted a general lack of risk information among Italian corporations: two out of three firms report having an incomplete picture of their risk exposure (Gurisatti and Mantovani 2010). The problem seems related to two main questions:

1. C-risk exposure is very different from market risk (M-risk) exposure. Corporations are organic bodies; thus, they represent a variety of elementary risks that can react to M-risk(s) in order to produce different C-risk exposures. Such a reaction depends on managerial choices in the use of productive factors (i.e., organization). This is why C-risk must be considered an endogenous component of the firm, while M-risk is considered a systematic element of the market. Managerial decisions can manipulate C-risk, but C-risk is also embedded in the decisions themselves: measuring firm risk would require separate market-driven levels of risk from decision-driven ones.
2. C-risk measurement is mainly concerned with variability, particularly expected variability. Traditional financial reporting is based on absolute levels, mainly measured according to past facts; risk measurement must complete financial reporting given possible trends in business evolution. They are not independent measurement approaches but integrated ones; the actual performance of corporation is based on a return-to-risk discovery. Using variability indicators differs from corporate culture; for example, budgets are typically one-shot figure collections. The adoption of evolutionary relative measurements could be a step forward in C-risk awareness,

thus indicating the time persistence of specific businesses positioning themselves against competitors.

Value measurement provides a solution to this puzzle. Comparing expected (i.e., volatile) flows to discount rates (i.e., risk-premia embedded standards) is an efficient way to finalize managerial decisions regarding return-to-risk performance. However, value measurement can be expensive and biased. Unlisted corporations requiring value discovering may have measurement costs that are higher than the benefits they could obtain; listed companies may have biased prices due to market inefficiencies or information risk bubbles. Moreover, classical valuation theory is based on the two-fund separation theorem (Tobin 1958), thus requiring the market to be in equilibrium to fix investment values without accessing investor risk aversion – a very top-down approach. The empirical evidence (Campbell 2003) shows that the fundamental performance of a corporation is the main driver of market price fluctuations, but a relevant share of such fluctuations (at least 15%) is driven by changes in the discount rate (i.e., information risk premium). As noted in previous sections, the seminal work by Lintner (1965) joined two-fund separation theorem solutions with bottom-up measures, including those most widely used in financial reporting. The estimation and use of the confidence equivalent (the Rce) is the converse of Linter's approach: the estimation of the Rce can simplify value discovery (W), since the discount rate can be the RF rate, while in the classical case, the expected return is treated through risk-embedding rates. Digitalized accounting reports may yield insights into the relative position of a specific corporation. A broad benchmarking process for corporate returns can be performed using easily accessible standard data in order to (a) relativize the corporate-specific return, (b) estimate an expected return volatility, (c) fix cross-sectional measurement of M-risks, and (d) compute C-risk measures to be used as proxies consistent with Lintner's approach through a shortfall computation.

The starting point is very easy: C-risk has a different nature from M-risk.

M-risks are generally exogenous, so they cannot be shaped: their management trades off risks that are transferred to third parties vs. risks that the firm bears. Fixing a fair premium is mainly a matter of market efficiency deployed through a top-down approach, that is, from the market to specific risks, that always requires a benchmarking process to price any specific risk.

Conversely, C-risk is endogenous, being the result of a continuous-time managerial process of crafting inputs, such as specific risks, in a manner that allows the firm to survive. C-risk management is similar to that of any other productive factor, being based on make-or-buy decisions that aim to extract excess returns from the corporate investment as a whole. Pricing risk is a secondary step of valuing the efficacy of C-risk management choices through a bottom-up approach, that is, from specific risks to stakeholders. Benchmarks are very rare because of market incompleteness.

In both cases, a forward-looking approach is required, but value creation is based on different underpinnings:

- In the M-risk case, value creation is based on price mismatches (for instance, you pay for 9 but obtain 10) being generally (but not always) due to unfair market prices. In the C-risk case, value creation in based on the marginal contribution of the use of risk in a joint production process (for instance, you pay for 10 and obtain 10 while adding 1 elsewhere).
- In the M-risk case, today's equilibrium is supposed to be fully independent from yesterday's equilibrium (e.g., heteroscedasticity is noise). In the C-risk case, the time correlation must contribute to corporate returns, while damage may stimulate strong performance.

Standard financial research on risk has focused on M-risks due to the basic necessity to fix a risk premium for valuation purposes, such as for discounting flows. The idea is to consider risk in a portfolio framework: investment choices are made according to the asset mix, since relationships between specific sources of risk are defined (by covariances). Applying such approaches to C-risk analysis may make measurement and management, or even pricing, ineffective due to the different nature of M-risk. C-risk is actually a portfolio of specific risks, but their relationship is endogenous (i.e., affected by covariances) rather than exogenous, being determined by managerial choices aiming to govern the firm as a whole (i.e., made to obtain several other targets).

Unfortunately, even standard financial reporting measures risks inefficiently, as they are mainly backward-looking, whereas C- and M-risks require forward-looking approaches. Recent IASB guidelines tend to solve the problem by proposing fair value standards using a forward-

looking approach, such as impairment testing; real applications of such approaches reveal all the methodological difficulties of using the forward-looking approach (i.e., tomorrow's value is found using today's) instead of the backward induction approach (i.e., identifying the possible path from tomorrow's values to today's). That is why broadly diffused C-risk proxies have failed dramatically in recent financial crises: any proxy for C-risk based on financial reporting truly depends on the actual level of time correlation, namely, stickiness, of corporate strategies. The efficacy of these measures is too closely related to the persistence of a specific strategy, while risk in the firm is related to the deployment of unexpected scenarios, revealing the inability of the corporation to react over the short term. No quantum leaps are addressed, and no flexibility is considered.

This is why we require specific tools to measure C-risk. Regardless, very important suggestions to improve C-risk measurement can be extracted from M-risk approaches, the most well known being the CAPM. Three points are of the utmost importance:

1. The benchmarking process supports any M-risk model. No risk assessment can be conducted without comparing the competitive and tolerated risk levels.
2. The focus is on the return-to-risk ratio rather than on the risk level itself. No risk assessment can be conducted without comparing the risk level with the expected return.
3. The forward-looking approach. The concept of risk itself is concerned with potential levels of corporate economics in possible scenarios (i.e., states of nature).

In this concept, risk – that is, expected variability – measures must be included in standard financial reporting as part of the input set that is compared to corporate output, as in any other economic choice. Financial analyses based on the ratios depicting input-output relations (e.g., margin-to-capital ratios, such as ROI or ROE) must be completed to consider both measures of (i) risk tolerance/aversion, assessing the threshold level and fixing the boundaries of extreme variability (e.g., margin-to-risk ratios), and (ii) expectations concerning the relationships between risk as a productive factor and other inputs in corporate economics (e.g., risk-to-capital ratios). Figure 4.3 depicts the addition of the risk dimension to financial reporting in the case of capital investment analysis.

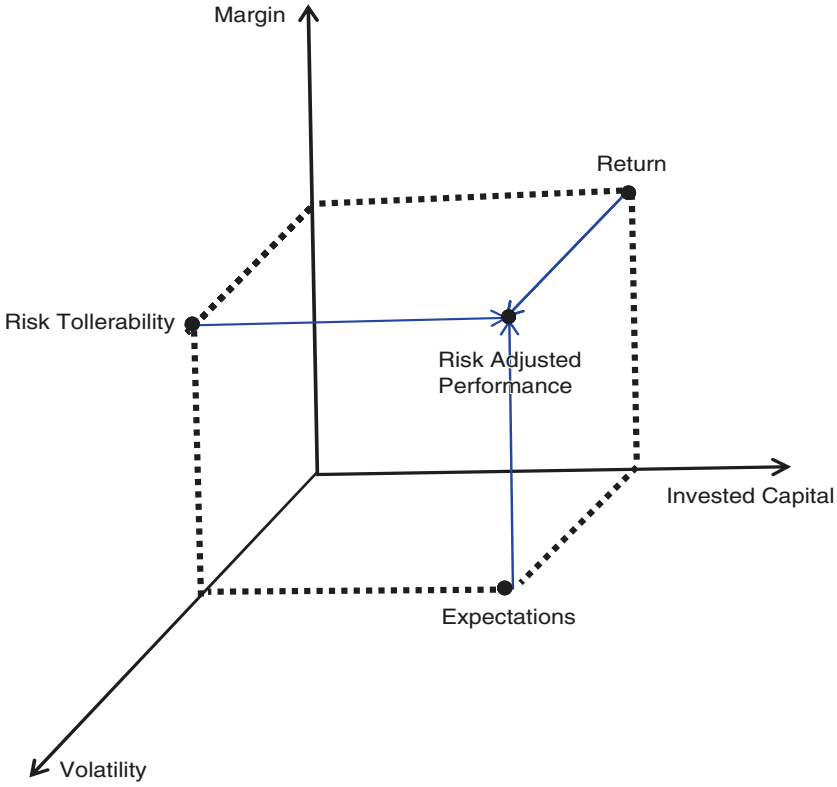

Fig. 4.3 The risk-adjusted performance measurement puzzle

From a methodological perspective, it is clear that the previous points in C-risk measurement require large datasets to run reasonable analyses. Presently, XBRL standard data facilitate such analyses, but their communicative efficacy could be improved by including risk indicators.

However, from an economic perspective, we have to consider the existence of information risk, that is to say, the possibility of biased perceptions of elements of (corporate) economics, including risk, due to communicative standards. This means that any improvement in the quantity of information provided by XBRL data must be compared to the quality of the information delivered.

Value chain risk (Gurisatti et al. 2010), depicted in Fig. 4.4, is a concept of C-risk management that can be usefully adopted in C-risk measurement. This concept is based on the original value chain developed by Porter (1985). As in Porter's original model, the firm is considered a loop in the chain linking suppliers to consumers; the dimensions of the corporate loop are based on the expected returns and possible variability/risk. The drivers affecting the dimensions are exactly the same as those contributing to corporate competitiveness.

Even the managerial choices adopted are the same, but they are considered for their contributions to the C-risk profile, thus becoming drivers of C-risk itself. In fact, any choice reveals the firm organization design features that are relevant under the C-risk approach, per its risk-sharing consequences. This means that relations with customers and suppliers are based on contracts with clauses that share risk across the several loops that comprise the global chain. However, even firm structure choices concerning relations with stakeholders and financial markets define the shares of C-risk borne by agents involved in firm activities. M-risks affecting the entire global chain are manipulated at any specific loop and transformed into specific C-risks. In this approach, the managerial problem of risk no longer consists of expensive risk reduction using complex financial tools but extends to

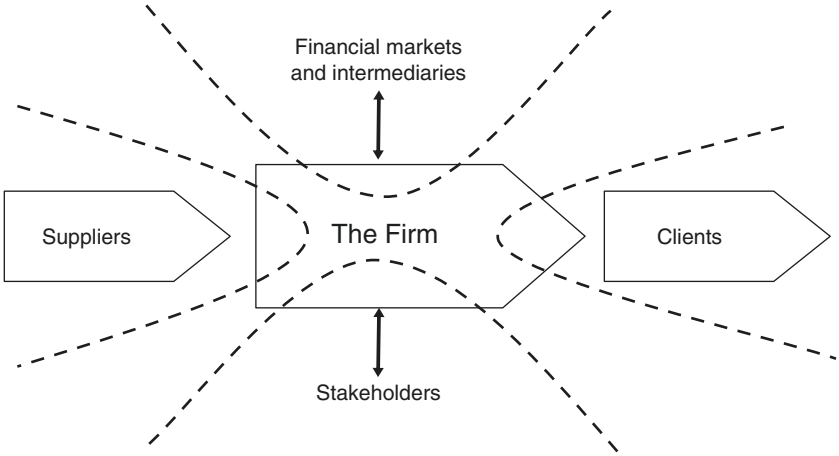

Fig. 4.4 The Value-risk-chain (VRC) model

competitive risk use (i.e., an increase in the return-to-risk ratio) through governance choices, as depicted by Bertinetti and Mantovani (2009).

The VRC approach can be used to define the C-risk model adopted by the firm and compared with the competitive and organizational models adopted to verify their coherence. According to the model, we can identify two axes. The horizontal axis (from suppliers to customer crossing the firm loop) defines risk management choices through the traditional chain connecting suppliers to customers. In this framework, the economics of any firm transaction is considered, even the risk-sharing process embedded in contracts. The vertical axis (the risk-sharing relations of the corporation) defines risk management choices, sharing risk with the market (choices aiming to transform C-risk into M-risk) and crafting risk via governance (using firm resources to address the specific risks comprising C-risk). These two axes require a joint solution or equilibrium; otherwise, no excess risk will be shared (the horizontal axis), but even risks that are either marketized or organized (the vertical axis) are not infinite. According to the VRC approach, the puzzle of a joint solution is solved using the following:

- #4 agency relations (firm structure choices): (i) customers, (ii) stakeholders; (iii) suppliers; (iv) financial system.
- #5 drivers (specific sources of risk) contributing to C-risk: (i) quantity, (ii) price, (iii) supply chain, (iv) technology, and (v) financial structure.
- #2 managerial choices: (i) make, or (ii) buy.

All of them contribute to measurable corporate economics and risk.

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C-risk is a portfolio of risks affected by managerial choices; the correct mix is defined by a strategy, namely, the organization requirements that allow the firm to increase its long-term competitiveness. M-risks can be easily bundled and unbundled by investors based on their risk aversion requirements, whereas C-risk management is entrusted with the bundling process, being closely connected to competitive commitments and time persistence. That is why we previously identified the reactive factor as the best protective and productive risk management tool. Competence is the foundation of this process.

From a risk management perspective, strategy means making decisions about a pool of inputs and resources that enable the competitiveness of a specific cycle (e.g., product, industry or technology life cycles), which requires the right stimulus and the right commitment. The persistence of good strategy choices signals the existence of competence in managing the firm; this implies not policy stickiness but the opposite, namely, a reactive approach. Managing C-risk is thus the art of balancing short-term stickiness with long-term reactivity: a trade-off managed mainly through expectations. When actual performance is expected to remain within set boundaries (determined by the strategy), no changes are required; the opposite is true in cases of unexpected change: reactions (if any) are required for survival. This is why several authors indicate that excess (i.e., over the boundary) volatility is a source of C-risk over the short term, whereas stickiness (the absence of reactions) is a risk source over longer periods.

According to this approach, C-risk measurement cannot be solved by the following processes:

- Discovering the "only" volatility measure, for example, the standard deviation of returns on capital, to use in the shortfall based approach, since Linter demonstrates the necessity of correlation measures, thus requiring a set of measures to identify at least five risk drivers embedded in the VRC.
- Avoiding the consideration of managerial choices, particularly those affecting the input-output of specific risks in the organization and governance of the firm, namely, the make (trusting in competence) or buy (through operative or financial transactions) decisions.

Evidence of a persistent factor in competitive strategic choices further increases the reasonableness of measures based on accounting data, even if they are based on a backward-looking approach. In fact, the hysteresis of strategic choices (Ghemawat 1991) allows us to suggest that accounting-based measures can be trusted proxies for real or optimal C-risk measures. This approach reinforces the Lintner-based framework presented above, while only methodological concerns about the duration of the measure remain. We suggest the consideration of the duration of the life cycle of the strategic issue (product, industry or technology), since persistence is evidence of competence inside the firm (Mantovani 2011).

This book proposes a pragmatic solution to the problem of measuring a pooled structure of risk drivers affected by managerial decisions: a modified version of the widely used break-even analysis (at the corporate level), which we will call the stochastic break-even (SBE) model. The SBE model should be highly compatible with both the shortfall and Linter approaches, while its actual deployment is based on the VRC model, as we will try to demonstrate below. Our version of the model focuses on earnings before interest and taxes (EBIT) at the corporate level. Its determinants are analyzed in a manner consistent with the agency relations included in the VRC model. Eq. 25 splits the EBIT determinants in terms of (i) the gross contribution margin (GCM), defined according to corporate relationships with clients (i.e., revenues, REV) and suppliers (i.e., corporate consumption (CON)); (ii) the salaries and other components of the cost of workers (JOB), the most relevant relationship with stakeholders; and (iii) depreciation and amortization (DEP), representing the main choice in terms of productive technology (clearly, in economic terms):

$$\begin{aligned} EBIT &= [(REV - CON) - JOB] - DEP \\ &= [GCM - JOB] - DEP = EBITDA - DEP \end{aligned} \tag{25}$$

The break-even approach suggests identifying the conditions for a zero EBIT solution, separating the fixed and variable components of EBIT. The SBE model identifies the risk conditions that allow corporations to generate any possible EBIT level (including zero). Since financial market relations must be considered in the VRC model, fixing a non-zero minimum threshold EBIT level is a suitable practical solution. In particular, the satisfaction of the expectations of both debtholders (mainly interest to be paid, INT) and shareholders (budgeted net income, BNI) based on the relevant tax treatment (TAX) will be considered. Two optimal EBIT levels can be found, as depicted by Eqs. 26.a and 26.b:

$$EBIT_D = INT \tag{26.a}$$

$$EBIT_S = INT + (BNI + TAX) \tag{26.b}$$

If we know the standard deviation of EBIT, the computation becomes a shortfall analysis, computing the probability of the downside risk related to

the zero level plus a set of probabilities related to the two thresholds, as reported below:

$$0 = EBIT + m_{Op}[sd(EBIT)] \tag{27.a}$$

$$EBIT_D = EBIT = m_{Dp}[sd(EBIT)] \tag{27.b}$$

$$EBIT_S = EBIT + m_{Sp}[sd(EBIT)] \tag{27.c}$$

In Lintner's approach, even a CE of EBIT can be computed; referring to the previous equations, the set of equations can be completed as follows:

$$fEBIT = EBIT - SH_r\left[\rho(ROC; r_m)\frac{ROC}{k}\right]sd(EBIT) \tag{27.d}$$

The above equations (Eqs. 27.a–27.d) very usefully illustrate the practical use of the model: using financial market data (if available), fEBIT can be computed, where (by reverting the use of the equation) any target fEBIT level implies an EBIT standard deviation and/or actual risk aversion measure. We suggest the computation of a theoretical fEBIT level using only the Sharpe ratio as the coefficient (=1); such a threshold could then be used to compute the fROC level (fEBIT/BV) to be compared with the RF rate, as indicated by Eq. 27.e:

$$fEBIT^* = EBIT - SH_r sd(EBIT) fROC^* = \frac{EBIT - SH_r sd(EBIT)}{BV} \tag{27.e}$$

Similarly, Eqs. 27.b and/or 27.c allow us to determine the implied standard deviation of EBIT, while [27.a] provides important insights into C-risk tolerance, a very important concept in corporate management used to discover the actual C-risk management style!

The standard deviation of EBIT is determined by the standard deviations of its components along with their cross relations, that is, a correlation matrix; the formula can be defined from any good statistics handbook. However, this is not the solution to our problem, since the use of a correlation matrix of the EBIT components is the same technique used in financial portfolio analysis: strategic decisions are evaluated neither for stickiness nor for reactivity; they are concerned with M-risk. Further

determinants must then be considered; they will be chosen according to the actual corporate mechanisms. Still, the VRC model can help us distinguish horizontal from vertical C-risk management decisions and identify the relations between exogenous sources of risk and C-risk, depicted as sd(EBIT). The horizontal axis in the VRC model is mainly related to risk drivers embedded in the GCM given a set of resources, namely, fixing JOB, DEP and their financing. The vertical axis is related to other components of C-risk, particularly the determinants that can be updated to guarantee the expected EBIT, that is, changes in JOB, DEP and funding service in response to the economic environment.

For any set of JOB, DEP and fEBIT (i.e., their funding service) values, expectations about the GCM are fixed in terms of (budget) levels, E (GCM), and variability, sd(GCM). Four fundamental risk drivers are embedded in the GCM: (i) quantities sold, (ii) selling prices, (iii) mark-up per unit, and (iv) consumption that is unrelated to revenues (e.g., fixed costs). All of these drivers are usually depicted through accounting-based measures that try to explain their impacts on dynamics, ceteris paribus. The mathematical perspective, that is, derivative analysis, is strongly criticized by businessmen for its lack of concreteness. From our perspective, it can provide a useful contribution to analyzing the required protective reactions, if any! The GCM composition is depicted in Eq. 28:

$$\begin{aligned} GCM &= REV - vCON - kCON = REV\left(1 - \frac{vCON}{REV}\right) - kCON \\ &= REV \times UMU - kCON \end{aligned} \tag{28}$$

where vCON is the REV-related component of CON, and kCON is the unrelated one.

Changes in quantities sold (∂REVq) generate a proportional impact on GCM if and only if no changes in either the unit mark-up (UMU) or selling prices (∂REVq = 0) occur. The equations below show the absolute and relative changes:

$$\frac{\partial GCM}{\partial REV_q} = UMU \qquad \frac{\Delta\%GCM}{\Delta\%REV_q} = \frac{REV \times UMU}{GCM} \tag{29.a}$$

In professional practice, Eq. 29.a is usually known as operating leverage and is normally calculated by supposing either JOB or DEP to be fixed

costs (i.e., supposing non-vertical C-risk management activities). The actual computation is reported in Eq. 29.b:

$$\frac{\partial EBIT}{\partial REV_q} = UMU \qquad \frac{\Delta\%EBIT}{\Delta\%REV_q} = \frac{REV \times UMU}{EBIT} = GLO \tag{29.b}$$

GLO is the scale factor that connects sd(EBIT) to the quantity-driven sd(REV), ceteris paribus, as depicted in Eq. 30:

$$sd\ (EBIT) = sd(REV_q) \times GLO \tag{30}$$

Eqs. 29 and 30 indicate potential relationships; actual impacts depend on the cross-relations of sd(REVq) and other GCM components. Regardless, it must be considered that the limitations of actual relations will depend on strategy rigidity: the higher the latter, the less correlated the former.

Ideally, cross-relation indexes are used as proxies of C-risk in financial analyses of risk: this is the case for price risk. Change in revenues due to price movements (∂REVp) produce changes in GCM similar to those indicated by Eqs. 29.a and 29.b. Eq. 31 explains:

$$\frac{\partial GCM}{\partial REV_p} = \partial REV_p \qquad \frac{\Delta\%GCM}{\Delta\%REV_p} = \frac{\partial REV_p}{GCM} \tag{31}$$

Given the direct (ceteris paribus) impact on GCM, the practical approach differs from that in Eq. 31, since a compensative ∂REVq that has no impact on GCM is sought. Such a measure is known as the price leverage (GLP) and is widely used because of its direct comparability to the elasticity of demand schedule. Eq. 32 depicts the calculations:

$$\frac{\partial REV_q}{\partial REV_p}|_{\partial GCM=0} = \partial REV_p \qquad \frac{\Delta\%REV_q}{\Delta\%REV_p}|_{\Delta\%GCM=0} = \frac{1}{\frac{GCM}{REV} - \Delta\%REV_p} = GLP \tag{32}$$

The actual impacts on GCM and EBIT depend on the gap between GLP and the actual reaction (i.e., without the zero impact constraint) of quantities sold to price changes. Inserting Eq. 32 into Eq. 31, yields Eq. 33:

$$\begin{aligned}\frac{\Delta\%GCM}{\Delta\%REV_p} &= (GLP-\eta)\Delta\%REV_p(GCM-\Delta REV_p)\\ \frac{\Delta\%EBIT}{\Delta\%REV_p} &= (GLP-\eta)\Delta\%REV_p(GCM-\Delta REV_p)\frac{GCM}{EBIT}\end{aligned} \tag{33}$$

where η is the ratio between the actual reaction of quantities sold to price changes (i.e., the demand elasticity).

Similarly to the previous analysis, any change in selling prices could be offset by parallel changes in buying prices (and vice versa), thus allowing the firm to manage price risk by bypassing the VRC. The level and volatility of the ratio between GCM and REV represent such a capability; in particular, the higher the volatility, the lower is the firm's ability to control the mark-up process through VRC. A complete analysis of the looping into the VRC model should also consider the impact of working capital, particularly operating working capital (OWC). In the Italian case, OWC is considered since the actual transaction strength of the firm in the VRC model could be compromised by clauses concerning payment timing and warehousing. Thus, we suggest the adoption of a measure of working capital intensity (OWC/REV) as an indicator of C-risk: the higher the ratio, the higher the EBIT threshold considered for the computation of the SBE.

To complete the analysis of the SBE model, two items must be considered: JOB and DEP. We have already discussed the corporate need to be reactive, as indicated on the vertical axis of C-risk management considered in the VRC, since they affect several aspects linked to governance and strategic choices. This book does not aim to detail the governance-related aspects of JOB or its impacts: these have already been discussed by Bertinetti and Mantovani (2009, AIDEA). Only the strictly methodological aspect reported in that paper is considered here: the higher the correlation between JOB and GCM, the higher the economic risk that the firm shares with its workers, thus compressing final EBITDA volatility. The actual possibility of having high-correlated JOB and GCM depends on several variables, particularly the completeness of the market for workers, the completeness of the workers' contracts (Rajan and Zingales 2000), and the average monetary value of the per-unit JOB (i.e., the actual valuation of the contribution of each worker).

A very similar conclusion is reached for DEP. Unlike JOB, the DEP contribution to C-risk can be analyzed by considering the economic

lifecycle (ELC) of the technology adopted by the firm. The ELC can be considered the duration solution to Eq. 34:

$$BV = \sum_{t=1}^{ELC} \frac{EBIT_t}{(1+k)^t} \tag{34}$$

A longer ELC indicates a longer period of potential constraints on productive processes, so higher risk affects the corporation through reduced reactivity. A longer ELC increases the relative impact of DEP on EBIT and its standard deviation.

To conclude this discussion of risk persistence, we propose the reporting of standard financial measures:

1. A synthetic measure of C-risk using a set of three probabilities (Op, Dp and Sp);
2. A set of indicators providing complete information about both the horizontal (GLO, GLP, OWC/REV) and vertical (ELC and the traditional debt-to-equity ratio) axes of C-risk management procedures;
3. Computation of the fEBIT* and, consequently, of the fROC* to be compared with the risk-free rate.

Under optimal conditions, these measures could even be compared with data on corporate competitors and/or benchmarks to determine the relative position of the firm disclosing its data. A time series of the relative position could clarify the actual relationship between corporate returns (RtC) and benchmark returns (r_m and k) that we have previously shown provide the basis for the ρ (ROC; r_m) and ROC/k computations, which are very useful to determine (real) fEBIT thus C-risk tolerance.

5 The Governance Puzzle of Letting Value Emerge

A number of studies in the corporate governance literature establish positive relationships between firm characteristics and firm performance (Zingales 1998b; Brickly et al. 1994; Williams 2000b; Drobetz et al. 2003; Byrd and Hickman 1992; Hossain et al. 2001; Rosenstein and Wyatt 1990b; Gemmill and Thomas 2004; Weisbach 1988). Before delving into this relationship, it is important to distinguish between "outsider systems of corporate

governance" and "insider systems of corporate governance". Companies in Europe, particularly in Italy, are part of the latter group. Insider systems are characterized by concentrated ownership or voting power and a multiplicity of inter-firm relationships and corporate holdings. The advantage of concentrated ownership or voting power is that it can overcome problems with monitoring management (as is typical in outsider systems). However, the basic conflict is between controlling shareholders and outside minority shareholders. In fact, although concentrated voting power has the advantage of improving monitoring and, in principle, firm performance, the controlling owner also has an incentive to extract private benefits. Concentrated ownership or voting power raises the possibility that large block holders or majority shareholders collude with management at the expense of small shareholders. One consequence of rent extraction by controlling shareholders is that it raises the cost of equity capital, as minority shareholders demand a premium on shares issued. In this case, ownership and voting power concentration can become detrimental, since small investors avoid holding shares, and the flow of external capital into the firm is severely impeded (Shleifer and Vishny 1997b; La Porta et al. 1997; and Barca 1995).

If we consider the firm a nexus of stakeholders completing transactions governed by agency contracts, the power of entrepreneurship to govern it can be detected. In fact, stakeholders have economic incentives to keep contracts alive as long as they can benefit from the transactions carried out by the firm. When these incentives disappear, the contract is abandoned. The firm is said to be sustainable from an economic perspective (it is a long-term performer) if the decision of a specific stakeholder to abandon the firm does not disrupt the nexus. The decision of a single stakeholder regarding its contract with the firm is based on the joint consideration of (a) the economics of the specific (short-term) transaction, and (b) those arising from the long-term survival of the nexus. The framework of contracts is optimized as a whole, which conflicts with the optimization of a single transaction; indeed, a process comparing short-term and long-term advantage. From a financial perspective, such a trade-off might be soundly managed through a concept of present value that includes both single (i.e., short-term) transaction returns and the stream of (i.e., long-term) expected returns. However, the computation of present value can be misleading if financial markets are incomplete (Allen and Gale 1994); in such a case, the stakeholder prefers to enter an incomplete contract (Zingales 1998) to have the opportunity to opt out of the contract in

the event of an unexpected scenario. Incorrect contract values may arise from biased expectations about (a) the existence and level of cash flows, (b) discount rate computations (embedded risks), and (c) time horizons. All firm stakeholder transactions refer to contingent claims regarding the above three elements, while all governance frameworks refer mixtures of these elements. Inefficient equilibria easily arise from the joint incompleteness of financial markets and contracts.

The entrepreneur can be the ideal actor for improving the efficiency of the corporate governance nexus. In essence, such mechanisms allocate value among firm stakeholders and help preserve the economic benefits needed to maintain the contracts. The ability to allocate value implies the ability to solve the trade-off between short- and long-term performance, and satisfying stakeholder expectations implies keeping the nexus alive, that is, ensuring firm sustainability. In cases of misallocation, agents initially react by requiring greater returns, namely, a risk premium is added to the discount rate, but the contract is exited if the situation cannot be addressed, making the contracts (and the stakeholder nexus) unsustainable.

The financial profile of the corporation can make no exceptions to this rule. Banks tend to maintain more complex and longer-term relationships with corporate sector actors in insider systems. Close relationships between banks and firms in insider systems provide greater access to firm-specific information and are thought to contribute to lower risk premiums, thus reducing the overall cost of capital for firms. However, insider systems are characterized by small and illiquid public capital markets and by the absence of venture capital markets; thus, new firms and SMEs may find it very difficult to obtain equity financing. Therefore, the financing pattern for SMEs in an insider system relies more heavily on debt financing than do firms in outsider systems. This is a serious problem for new firms, which have no track records or long-term relationships with financial sector actors, leading banks to lend conservatively. In insider systems, the absence of an active equity market and heavy reliance on debt financing both hamper the development of a vibrant and thriving SME sector. According to the OECD Principles of Corporate Governance (2004), an effective corporate governance system can reduce the cost of capital and improve the efficiency of firm resource use, thereby promoting growth.

These factors lead us to consider whether entrepreneurship is a governance tool that implicitly and explicitly increases firm value and leads to more profitable firm performance and, accordingly, a superior ability to obtain credit from the banking system. Recent empirical work may help

clarify the true relevance of entrepreneurial governance for business performance. A sample of manufacturing firms incorporated in three regions of northeastern Italy (Veneto, Friuli Venezia Giulia and Trentino Alto-Adige) with high densities of entrepreneurial business was considered. Continuous yearly balance sheet data for the 2006–2012 period were considered and compared for seven key drivers of governance:

(i) BvD (Bureau van Dijk) Independence, an indicator that classifies firms based on the level of ownership concentration. According to the literature on US and UK firms (Berle and Means 1932; Leech and Leahy 1991; Prowse 1992; Agrawal and Knoeber 1996; and Cho 1998), owner-controlled firms (one equity holder has a block exceeding 10%) outperform manager-controlled firms. Hence, the US and UK data provide support for the hypotheses that large shareholders are active monitors and that direct shareholder monitoring boosts firm performance.
(ii) Presence of a Manager in the Ownership Structure. This variable is constructed as a dummy variable that equals 1 if there is a manager in the ownership structure. It is hypothesized that the presence of a manger in the ownership structure indicates better governance quality.
(iii) Team Size is the number of people involved in the management of the firm. This variable is adjusted by firm size. It is hypothesized that the larger the team, the better the firm's governance.
(iv) One Manager. This is a dummy variable that equals 1 if the company is managed by a single person. This is particularly interesting to examine for the Italian SME sector because this situation is not uncommon. It is hypothesized that being managed by a single person does not indicate high quality.
(v) CEO Duality. This is also constructed as a dummy variable that equals 1 if the CEO is also the chairman of the board. Harris and Helfat (1998) argue that the absence of CEO duality negatively impacts firm performance mostly due to agency problems and poorly developed succession plans and managerial capabilities. The absence of this condition is related to good corporate governance.
(vi) Board of Directors Independence, an indicator variable that equals 1 if there are two or more managers on the board of directors. According to agency theory (Fama and Jensen 1983;

Shleifer and Vishny 1997b), boards with a majority of non-executive directors reduce agency conflicts because non-executives can effectively monitoring the board. Greater independence indicates better corporate governance.

(vii) Board of Directors Size. This variable is adjusted for firm size. The literature reports a negative effect of board size on firm performance mainly due to the negative effects of poor communication and decision-making procedures (Guest 2009). However, these studies focus on large companies. The effect on SMEs is not clear. Bennedsen et al. (2007) also find that the effect is negative for SMEs. Thus, smaller boards of directors indicate better governance.

The resulting sample consists of 4,975 firms with governance data, as reported in Table 4.1.

This section considers whether there is a relationship between historical and prospective firm performance (including the competence value) and considers the effective financing received from the banking system. A more traditional analysis (i.e., a return-to-governance investigation) is augmented by a risk-to-governance investigation based on an integrated rating methodology developed using the same Lintner (1965) CE model presented in this book. Some intriguing results arise:

(i) The Italian banking system seems inefficient in both credit allocation and pricing. In fact, in the above sample, 47 out of 100 firms receive more credit than average. At the same time, 52 out of 100 studied, "deserve" credit funding. The main issue is that the former 47 do not coincide with the latter 52. Comparing the results, only 26 firms deserve and obtain credit funding, whereas only 27 firms do not deserve and do not receive funding.

(ii) In terms of the relationships between governance and ownership structure and between firm performance and the firm's ability to raise capital from the banking system, we observe that *the banking system favors firms with concentrated ownership, those governed by one manager and smaller teams*, characteristics contrary to corporate governance best practices.

In fact, according to Tables 4.2 and 4.3, of the relevant governance items, the presence of manager-owners (typical in entrepreneurial

Table 4.1 Descriptive statistics: corporate governance variables and balance sheet data

Corporate Governance Variables	*N*	*Average*	*Median*	*Std. Dev.*	*Min*	*Max*	*1Quart*	*3Quart*
One Manager	4816	0.28	0.00	0.45	0.00	1.00	0.00	1.00
Team Size	4816	0.66	0.50	0.77	0.00	8.75	0.00	1.00
Bvd Independence Indicator	4850	2.92	4.00	1.26	0.66	4.00	1.66	4.00
Manager in the ownership structure	4816	0.71	1.00	0.38	0.00	1.00	0.50	1.00
BoD Independence	4816	0.32	0.00	0.47	0.00	1.00	0.00	1.00
CEO Duality	4816	0.35	0.00	0.48	0.00	1.00	0.00	1.00
BoD Size	4816	1.67	1.52	1.04	0.00	9.10	0.75	2.21
Balance Sheet Variables	*N*	*Average*	*Median*	*Std.Dev*	*Min*	*Max*	*1Quart*	*3Quart*
ROI%2007	4975	23%	13%	185%	−5309%	6441%	7%	26%
ROI%2008	4975	9%	10%	496%	−29066%	2368%	4%	21%
ROI%2009	4975	16%	6%	351%	−1380%	24380%	0%	14%
ROI%2010	4975	14%	7%	75%	−1419%	2688%	2%	16%
ROI%2011	4975	17%	7%	272%	−2641%	17335%	3%	16%
ROI%2012	4975	10%	6%	130%	−3829%	4060%	2%	14%
DEB/OPER %2007	4960	12%	9%	27%	−347%	405%	−2%	24%
DEB/OPER %2008	4958	13%	9%	30%	−482%	461%	−2%	26%
DEB/OPER %2009	4958	15%	10%	39%	−581%	984%	−4%	31%
DEB/OPER %2010	4967	15%	9%	106%	−628%	6238%	−4%	27%
DEB/OPER %2011	4968	18%	10%	342%	−446%	23984%	−4%	28%
DEB/OPER %2012	4959	15%	10%	61%	−904%	2413%	−4%	31%

This table provides summary statistics for 4,066 firms located in the North Eastern Italian region of Tri-Veneto. Corporate Governance Variables are extracted for the last year of analysis (2012) as they are only available for the current period of analysis in the database. Balance sheet data are provided over 6 years

Table 4.2 Percentile analysis-test of difference

Sub-Sample	*Rating [0–50%]*		*Rating [50–100%]*		*Probability (test on difference)*	
Variables of governance	*Mean*	*Variance*	*Mean*	*Variance*	*P(test.t)*	*P(test.F)*
Board Independence	0.3316	0.2218	0.3163	0.2164	0.1531	0.5862
CEO Duality	0.3398	0.2245	0.3469	0.2277	0.3194	0.7500
Ownership Concentration	2.9230	1.6880	2.9161	1.6610	0.4330	0.7172
Presence of Manager among Shareholders	0.7032	0.1435	0.7324	0.1286	0.0065***	0.0152**
Only one manager	0.2146	0.1686	0.2244	0.1741	0.2260	0.4710
Team Size	0.6346	0.5864	0.5952	0.4682	0.0446**	0.0000***
Board of Director Size	1.5763	1.1634	1.5275	0.9728	0.0670*	0.0001***

* Significance at 10%
** Significance at 5%
*** Significance at 1%

Table 4.3 Regression statistics for ex-ante performance and governance/ownership characteristics

Dependent variable: Rating				
Independent variables	*Constant*	*Coefficient*	*T-stat*	*R-squared*
Board Independence	–0.1349	0.1426	0.6170	0.0001
CEO Duality	–0.1426	0.1572	0.6921	0.0001
Ownership Concentration	0.1189	–0.0692	–0.8717	0.0002
Presence of Manager among Shareholders	–0.4952	0.5669**	1.9777	0.0008
Only one manager	0.0103	–0.4155*	–1.6829	0.0006
Team Size	–0.2110	0.0832	0.8470	0.0001
Board of Director Size	0.0107	–0.0008	–0.2453	0.0000

* Significance at 10%
** Significance at 5%
*** Significance at 1%

environments and for a large share of SMEs in northern Italy) seem to uniquely impact both operating and financial performance.

A concluding question can thus be offered: Is entrepreneurship beyond standard governance rules? Based on our evidence, an affirmative answer seems possible, even if the lack of efficient banking financing instruments for this kind of business also seems clear, as depicted in depth in the final sections of this book.

CHAPTER 5

How to Measure the Competence Value (from the Q Ratio to the T Ratio)

Abstract A practical application of the T ratio methodology is illustrated over a sample of more than 3,000 companies of the very entrepreneurial district of Treviso, North-Eastern Italy. The hurdle rate of return is computed by adopting to the "confident equivalent" methodological framework, an original evolution of the "certainty equivalent" proposed by Lintner (1965, The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets, in *The Review of Economics and Statistics,* 47, 13–37), compliant with the Fisher Black's zero-beta model (1972, Capital market equilibrium with restricted borrowing, in *Journal of Business*, 45(3), 444–455). The missing overlap between competence (T ratio) and competitiveness (Q ratio) is exploited, since 10%, only, of the examined companies have both sound values. By financing the 42% high-Q companies, only, you also source the 32% (=42–10) with no long term performance persistence, but avoid to finance the 21% high-T companies with no short-term results being at the initial stages of their entrepreneurial cycle.

Keywords T ratio computation · T ratio vs. Q ratio computation · Market shortfall esteem · Entrepreneurial return threshold · Competence based business · Competitive business · Competence and competitive overlaps

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_5

The full adoption of techniques based on the Basel II agreement has dramatically changed the funding procedures used by financial intermediaries to determine credit allowances. Consequently, both entrepreneurial businesses and SMEs have been severely affected by a size-specific credit crunch due to their higher credit risk, as determined by standard financial analysis procedures (Brav 2009). Entrepreneurial firms have experienced an even more dramatic crunch due to their high concentration of investment in intangible assets, growth opportunities and, most of all, skills embedded in human capital (Kerins et al. 2004). Both debt and equity capital have been diverted from entrepreneurial finance transactions by more risk-averse investors (or biased investors) due to their low return-to-risk ratio and perceived excess risk. The regulation framework thus protects investors but reduces total credit flows rather than improving their return-to-risk performance. This is why announcements of new Basel standards are often depicted as a countdown to the end of entrepreneurial financing.

No one is able to definitively say whether the above-mentioned problems stem mainly from methodology (i.e., specific techniques of financial analysis) or from assessment (i.e., concepts of entrepreneurial business valuation and management). It must be recognized that neither professionals nor academics have produced an unequivocal answer to this puzzle; however, they increasingly tend to blame each other for the failure to resolve it (Rajan and Zingales 1995). Indeed, the Basel regulations increased the rationality of financial intermediaries' behavior. By comparing the bulk of technical documents from the official website of the Bank of International Settlements using the methodological approach proposed in this book, a paradox emerges: while both are based on a shortfall approach to risk aversion, the Basel principles wrench those principal toward neoclassical solutions. This makes the "sound" application of the rules of entrepreneurial finance transactions increasingly difficult; the lacking of competence value measurement is probably the common root of both sides of the puzzle. The methodology proposed here is fully Basel compliant and could help in the design of innovative entrepreneurial funding solutions.

On the methodological side of the puzzle, financial analysis best practices exhibit a kind of schizophrenia – they recognize the importance of basing analytical tools on market values, but real applications suggest the use of book value-based criteria, especially for unlisted corporations. The need to strike a balance between book values and

market values remains the most difficult problem to tackle; their contributions to knowledge are both clear, but reconciling the results of these two approaches in order to offer appropriate solutions for business people is extremely difficult. On the conceptual side of the puzzle, real entrepreneurial finance is usually missing market values due to the lack of practical pairing groups in value benchmarking. This is because theory forces them to use value estimation approaches based on standard/neoclassical financial models, all having a clear defect in small business financial analysis: they miss values that have not emerged due to market incompleteness, that is, they are aborting entrepreneurship. Thus, the loop becomes clear; no measurement means no assessment, meaning no business decisions and no investment which in turn means no market values and no measurement opportunities (Faulkender and Mitchell 2006).

The Italian case can help us bypass these difficulties, since the problem seems complicated by the typical structure of businesses; small companies, strong ownership control, undercapitalization and a lack of transparency in financial statements are all elements that complicate the investigation. Different approaches are often used to solve the information asymmetry that results from the Italian business context that generates the above-mentioned credit rationing. At first, this sounds like the correct approach, but it cannot explain the above-average performance of several small business districts (e.g., the north-eastern area of Veneto) or their long-term persistence. Moreover, it cannot explain why good performance is concentrated in rationed companies, while bad debts continue to accrue on bank balance sheets. Finally, such an approach fully demonstrates the current limits of growth opportunities (Kilby 1971), as clearly shown by the data regarding business development in Italy.

The complexity generated by anomalies and asymmetries in the Italian case can require exceptional gymnastics to develop alternative approaches to entrepreneurship, all of which stem from practical skill measurement to support sound practices in entrepreneurial finance transactions. This may be why support for this book was provided by a private foundation named for a real *ante litteram* entrepreneur. The persistent performance of Italian SMEs supports the adoption of a conceptual scheme wherein the strength of economic activity is evidenced by the creation and emergence of a competence value, as measured by the T ratio.

Based on the algorithms in the above section, the following section depicts the computation of the T ratio for the Treviso district (the TV area), a very competitive area outside of Venice in northeastern Italy.

1 Computing the Q Ratio, the Potential Q Ratio and the T Ratio in Practice

We move beyond the standard estimation of the cost of capital in our sample. The basic assumption is that the average risk within TV equals the risk at the Italian level, so the TV beta equals 1.00. Given a 9% equity risk premium, which is higher than the long-term average in the Italian data due to GDP fluctuations, in Mehra and Prescott's model (Mehra and Prescott 1985), prescriptions and specific levels of risk are related to the illiquidity of unlisted companies. The estimated cost of capital (k) for TV companies is 10.87%, as shown below using the standard CAPM formula:

$$k = 10.87\% = 1.87\% + 9\% \times 1$$

where 1.87% is the RF rate at the moment of computation (February 2011).

The long-term estimation of the Italian stock market indicates an 18% standard deviation of price returns on a yearly basis. We fixed the confidence level at 10%, which implies a higher risk tolerance than that implied by underlying value-at-risk Basel standards (at a confidence level of 1%) but is consistent with risk aversion in Italian SMEs. Regardless, we know from the discussions in previous chapters that this choice should not impact the reasonableness of the results given the background of Lintner's approach. We can compute the shortfall level for the average equity risk premium at a 10% confidence to determine a market's maximum tolerated loss:

$$m - SHF = 1.87\% + (9\% - 1.282 \times 18\%) \times 1 = -12.21\%$$

This figure (–12.21%) is the zero-beta anchor of the model.

The average book return for TV companies is 8.45%, while the standard deviation of the distribution of such book returns is 12.16%. A correction to the standard deviation is to be done according

to the skewness of the distribution, mainly due to different expected growth ratio of the corporation. The corrected standard deviation is 20.66%.

Given the previously –12.21% computed market SHF-level, the average threshold rate of return ($k*$) for competence value estimation can be determined in 14.28% by referring to the SHF line as follows:

$$k* = -12.21\% + 1.282 \times 20.66\% = 14.28\% = \{(r-x) + \left[p/(1+k)^t\right][x+c]\}$$

The same computation can be repeated for any industry/company in order to identify the industry-specific $k*$ level. Accordingly, the Q and T computations can be performed using the formulas proposed above:

$$\mathbf{Q} = [W_1/BV = (r-x)/k] = r_i/k$$

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

Since $Q + T = r*/R_f$, where $r*$ is the confidence equivalent return of the investment, the T estimate can be confirmed as follows:

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

The application that follows is based on a standard five-year period.

2 An Empirical Application of the T Ratio (the Case of the Venetian Area)

In this section, we illustrate the calculation of the T ratio. The results will be compared with those from more standard analysis searching for Q ratio. Since industry level data are considered, all computations have a time bias stemming from the steady-state growth approach.

Before describing the sample in detail, it is appropriate to emphasize that the collection and selection of data, as well as a portion of the analysis and calculations were conducting using the AIDA database (computerized analysis of companies) published by Bureau Van Dijk Electronic Publishing, which was accessed in accordance with an agreement between the corporation and Ca' Foscari University. This database

contains accounting information only for companies that are obliged to publish financial reports; generally speaking, this is mandatory for legal entities whose owners/shareholders have limited liability. According to the proposed competence value emersion theory, the choice of legal entities included in our analysis was based on a logic of continuity. In fact, in the ex post analysis, we require that the selected companies meet the going concern assumption. That is why our sample includes only companies whose financial reports are continuously accessible from 2005 to 2009.

The resulting sample consists of 3,046 companies in the TV area, as indicated in Table 5.1. It includes both firms that are obligated to prepare detailed financial reports in accordance with Italian law (26.94% of the sample) and companies eligible to provide abbreviated financial statements (73.06% of the sample). Both kinds of reports include enough data to validate the competence value using an ex post approach.

The data presented in Table 5.1 depict the industry distribution of firms by both the Italian standard classification (ATECO) and the Standard Industry Classification (SIC) code. A sufficient number of companies are included in the ATECO groups to compute affordable descriptive statistics of firm performance for any industry included in the TV area. For each industry, we computed the mean and median values of the ROI along with the standard deviations. The difference between the mean and median provides an intuitive proxy for the existence of best performers, companies including both competitive (i.e., goodwill-based) and expertise- or skill-based (i.e., competence value–backed) firms. These top performing businesses are of interest to our subsequent investigations, supposing that this group includes the most competent firms. We then computed the industry cost of capital as the book-return threshold based on a standard CAPM. The data were based on industry betas extracted from the Ibbostson Cost of Capital Database; the raw data were then adjusted to the Italian context based on the different levels of systematic risk of the US and Italian markets. Table 5.2 displays the resulting data.

3 Computing the T Ratio

Applying these last three formulas to the above decrypted database, we can now identify two clusters of performance persistence in book returns for the entire TV area:

Table 5.1 Sample composition by industry

Industry (translation of the original Italian name)	*ATECO Code*	*SIC Code*	*# of corporations*
Agriculture and hunting services, forestry	01;02	0	63
Food and Drink	10;11	20	115
Manufacture of textiles	13;14.3	22	61
Manufacture of clothing, dyeing, tanning fur	14.1;14.2	23	49
Manufacture of leather goods made of wood, cork, straw	15	31	53
Manufacture of wood, cork, straw	16	24	104
Manufacture of paper and paper products	17	26	35
Publishing, printing and reproduction of recorded media	18;58.1	27	32
Manufacture of chemicals and artificial synthetic fibers	20;21	28	35
Manufacture of rubber and plastic products	22	30	96
Manufacture of other non-metallic mineral processing	23	33.5	79
Metallurgy – Manufacture and processing of metal products except machinery and equipment	24;25	34	314
Manufacture of computers and electronic and optical products, electrical appliances, etc.	26	35.7;36.7	24
Manufacture of electrical and non-electric domestic appliances	27 exept 27.5	36.1;36.2;36.4; 36.5;36.6	62
Manufacture of machinery and equipment	28; 27.5;33.12	35/35.7	192
Manufacture of motor vehicles, trailers and semitrailers	29;30	37	29
Manufacture of other transport equipment	31	25	237
Manufacture of furniture	32	39	38
Other manufacturing	41;42;43	15;16;17	310
Building societies	45	55	94
Trade, maintenance and repair of motor vehicles and motorcycles	46	50;51	483
	47	53;54;55;56;57;	150

(*continued*)

Table 5.1 (continued)

Industry (translation of the original Italian name)	*ATECO Code*	*SIC Code*	*# of corporations*
Commerce wholesale and commission trade, motor vehicles and motorcycles		58;59	
Retail (excluding motor vehicles and motorcycles), repair of personal and household goods; Land Transportation, pipeline transport, storage and auxiliary transport activities	49;52	40;42;47	80
Hotels and restaurants activities	55;56	70	27
Computer and related activities	62;63;95.11	73.7	65
Real Estate	68	65	115
Professional services	69;70;71;73;74	87	76
Recreational Cultural and Sports	90;91;92;93;59.1	79;83	28
	Treviso's District as a total		**3046**

Source: Our processing over AIDA database contents

1. Value-creating (competitive) corporations with returns that are usually above k (=10.87%)
   - 42.11% of companies in the database meet this condition
   - 1.6049 is their average Q ratio (computed as r_i/k)
   - 0.7773 is the average Q ratio of the entire TV area (less than 50% of firms are competitive).

2. Entrepreneurial (competence value) business show a persistent (10% at least) capability to exceed $k*$ (=14.28%) in the long run due to spillovers from competences
   - 31.58% of companies in the database meet this condition
   - 8.8990 is the potential Q ratio in the impending E-completing phase (computed as (r+c)/k)
   - 1.2818 is the current T ratio (i.e., estimation of W_2/BV).

The estimates by industry are reported in the following sections. These comprehensive results reveal some key points for the TV area: (i) The economic incentive to sustain the competence value is dramatically

Table 5.2 Beta, cost of capital (k), operating returns (ROI) and risks (std. deviation of ROI)

Industry (translation of the original Italian name)	*Beta*	*Cost of capital*	*Average ROI*	*Median ROI*	*Standard deviation of ROI*
Agriculture and hunting services, forestry	0.65	7.72	3.38%	2.56%	9.81%
Food and Drink	0.50	6.37	7.91%	7.23%	9.13%
Manufacture of textiles	1.60	16.27%	6.72%	6.19%	13.62%
Manufacture of clothing, dyeing, tanning fur	1.33	13.84%	11.91%	9.60%	16.70%
Manufacture of leather goods made of wood, cork, straw	1.56	15.91%	8.87%	7.97%	11.78%
Manufacture of wood, cork, straw	1.17	12.40%	6.63%	6.52%	10.39%
Manufacture of paper and paper products	1.02	11.05%	6.70%	6.86%	7.84%
Publishing, printing and reproduction of recorded media	1.01	10.96%	10.00%	9.39%	10.75%
Manufacture of chemicals and artificial synthetic fibers	0.57	7.00%	10.97%	9.30%	11.20%
Manufacture of rubber and plastic products	0.97	10.60%	8.67%	7.49%	11.57%
Manufacture of other non-metallic mineral processing	1.28	13.39%	6.86%	5.86%	9.66%
Metallurgy – Manufacture and processing of metal products except machinery and equipment	0.96	10.51%	10.28%	9.13%	10.93%
Manufacture of computers and electronic and optical products, electrical appliances, etc.	1.31	13.66%	9.37%	9.08%	13.21%
Manufacture of electrical and non-electric domestic appliances	0.89	9.88%	8.40%	8.55%	16.80%
Manufacture of machinery and equipment	1.26	13.21%	9.43%	8.08%	11.71%
Manufacture of motor vehicles, trailers and semitrailers	0.77	8.80%	8.31%	7.23%	9.42%
Manufacture of other transport equipment	1.24	13.03%	5.25%	5.64%	11.98%
Manufacture of furniture	1.11	11.86%	9.33%	8.26%	11.04%
Other manufacturing	0.76	8.71%	8.94%	7.25%	9.29%
Building societies	0.59	7.18%	7.13%	6.61%	10.42%
	0.81	9.16%	9.43%	7.63%	11.78%

(*continued*)

Table 5.2 (continued)

Industry (translation of the original Italian name)	*Beta*	*Cost of capital*	*Average ROI*	*Median ROI*	*Standard deviation of ROI*
Trade, maintenance and repair of motor vehicles and motorcycles					
Commerce wholesale and commission trade, motor vehicles and motorcycles	0.72	8.35%	7.63%	6.84%	13.05%
Retail (excluding motor vehicles and motorcycles), repair of personal and household goods; Land Transportation, pipeline transport, storage and auxiliary transport activities	0.92	10.15%	6.40%	6.70%	11.58%
Hotels and restaurants activities	1.62	16.45%	4.40%	3.11%	19.90%
Computer and related activities	0.96	10.51%	16.45%	12.53%	18.59%
Real Estate	0.74	8.53%	5.37%	3.99%	9.49%
Professional services	0.92	10.15%	12.62%	8.81%	18.57%
Recreational Cultural and Sports	1.10	11.77%	4.00%	5.36%	18.04%
	1.00	**10.87%**	**8.45%**	**7.18%**	**12.16%**

Source: Our processing over AIDA, Ibbotson, and Teofilo Intato Foundation database

high, even in cases extending into several years of the E-pullulating phase. An estimate of the maximum length of time needed to convert the present 1.60 Q ratio of competitive companies into the 8.90 Q ratio embedded in the T ratio of skilled firms is 13 years (12.83) when computed using a rate of return of 14.28%. Clearly, even the probability of success (p) can affect the duration; the higher the p, the lower the break-even t must be. With 30% probability (the typical probability that a venture is successful), the duration is reduced to 4 years (4.40). (ii) Competitive corporations (42.11%) do not overlap with entrepreneurship business (31.58%), even in very competitive districts, such as TV. Only 9.56% of companies are jointly competitive and competence-based. This means that 32.55% of corporations are competitive now but do not seem to have the ability to perpetuate their competitiveness over the long term. Conversely, 22.02% of

corporations are competence based without having sufficient short-term book returns (perhaps they are in the E-seed phase). According to this second point, the following cluster must be now considered:

3. Vulnerable firms exhibit operating results higher than their cost of debt capital (i.e., they are not in financial default) but are unable to satisfy shareholders's expectations
   - 20.44% of companies in the database meet this condition
   - 0.1293 is their average Q ratio (computed as r/k).

This lets us conclude with a third point depicting the effects of missing resources for entrepreneurial financing: (iii) the lack of capital for competent entrepreneurship is probably due to funding activities for vulnerable corporations, as supported by the warped implementation of Basel principles. Capital flow diversion from the 22.02% share of competence-based companies without immediate short-term returns to the 20.44% share of vulnerable firms is clearly evident from the T ratios. Since they were funded, we can suppose that these vulnerable companies once reported good Q ratios when they received capital, but no calculations of long-term persistence were performed, as implied by standard tools of financial analysis. Considering the role of debt capital in competence value emersion and in SME funding, you can conclude that the misallocation of banking capital reduces competence value detection and is a real obstacle to completing the entrepreneurial cycle (i.e., to long-term economic growth) for the entire TV area.

Computation at the industry level can yield further insights. The results indicate that the two indicators never converge. On average, however, the Intato T ratios are higher than the Tobin Q ratios. This suggests that few businesses have the capacity to complete the cycle transforming competence value into goodwill. Moreover, the gap between the T ratio and the Q ratio depicts the opportunity cost of bad lending among Italian banks even in a strongly competitive area such as the TV district. On average, approximately 51% (1.28–0.77) of total book value is missing; should entrepreneurial firms be able to complete the value transformation, the leverage ratio of these Italian undercapitalized companies would decrease dramatically. Moreover, standard Basel methods for calculating credit allocation and rankings refer to Q ratios, thus investing more money in apparently competitive industries while restricting credit to those with greater opportunities

(i.e., wider T-Q spreads). This probably determines the negative trend of non-performing loans observed in the TV area and recent difficulties in local banking in northeastern Italy.

Table 5.3 presents the Q and T estimates for the different TV industries. Overall, it is clear that very few industries have similar T and Q ratios. This evidence allows us to conclude that capital allocation in the TV area lacks selectivity. However, this is quite obviously the result of the wholesale use of analytical tools, since their aim is reversion to the mean rather than exploitation of exceptions (negative or positive!).

The data in Table 5.4 clearly indicate that the overlap between competitive and skilled firms is imperfect, implying that even the frequencies of Q ratios>1 and T ratios>1 do not converge. Notably, this is consistent with incomplete markets, simultaneously demonstrating that entrepreneurial value discovery requires more careful analysis using non-obvious methods. This is the opposite of the Basel large-N approach and wholesale adoption of standard techniques of financial analysis to search for industries with high levels of (short-term) goodwill rather than (long-term) competence value. This approach prevents consideration of long-run competition, which tends to reduce operating margins without providing opportunities for their recovery as in competence emersion. These standard approaches reduce capital flow processing costs but lead to pro-cyclical allocation, which further reduces opportunities.

Table 5.3 Tobin-Q-Ratio and Intato-T-ratio found in 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	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	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	0.3396	n.a.
Treviso's District as a total	**0.7773**	**1.2818**

Source: Our processing over AIDA, Ibbotson, and Teofilo Intato Foundation database

Table 5.4 Frequency of competitive firms and entrepreneurial firms

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	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	37.355	48.55%
Manufacture of motor vehicles, trailers and semitrailers	47.91%	34.61%
Manufacture of other transport equipment	25.795	15.43%
Manufacture of furniture	40.94%	42.87%
Other manufacturing	51.005	43.43%
Building societies	49.805	14.13%
Trade, maintenance and repair of motor vehicles and motorcycles	50.92%	32.06%
Commerce wholesale and commission trade, motor vehicles and motorcycles	47.795	13.06%
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%**

Source: Our processing over AIDA, Ibbotson, and Teofilo Intato Foundation database

CHAPTER 6

Funding the Competence Life Cycle to Create Value and Allow It to Emerge

Abstract Traditional debt and equity funding fail to give the required financial support to entrepreneurship. In fact, the legal framework which distinguishes them is based on seniority and asset-based financing. While seniority helps to calibrate the quantity of risk between the two categories, the asset financing fails to sustain the competence value emersion. This is why entrepreneurial finance is perceived as too risky for debt capital, while equity capital investors claim for troubles in controlling the agency costs emerging from the deals. The proposal in this book is focused on contingent claim structured debts to sustain competence-based financing deals. The debt maturity is the key element to design, given its contribution to conclude the entrepreneurial cycle. This required skilled financial intermediaries, which seem to be very rare.

Keywords Entrepreneurial debt and equity financing · Structuring entrepreneurial leverage · Debt maturity and competence emersion · Asset-backed financing instruments · Competence-driven financing instruments · Competence pickers

Capital structure is a fundamental puzzle in financial theory, which is even more complicated if we focus on SMEs, as entrepreneurial finance is typically considered at the theoretical level. While a definitive solution to

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_6

the puzzle does not exist, higher corporate risks suggest an increase in the equity share of overall corporate funding. This is why entrepreneurial finance transactions are usually focused on the use of equity capital. From a different perspective, sound approaches to SME financing suggest opportunities for intermediaries (e.g., banks) to be involved in these transactions to reduce agency costs; such involvement is also suggested in equity venture finance, since the specialization of intermediaries permits better monitoring. In addition, low liquidity tends to increase the risk profiles of investments in entrepreneurial businesses, making corporate fundraising increasingly difficult. Based on the above concepts, entrepreneurial finance is usually considered the domain of equity finance and is provided by specialized intermediaries.

Wider implementation of the Basel agreements in banking makes the funding of small and entrepreneurial businesses increasingly difficult. In fact, a lack of assets to support the leverage granted to the company along with a lack of information flows to support growth monitoring simply diverts corporate funding from debt to equity capital. As evidenced by this trend, the Basel agreements have dramatically changed the funding procedures used by financial intermediaries, while SMEs have commonly experienced dramatic credit reductions due to the higher credit risk estimates of standard financial procedures. The short-termism of the financial system also contributes to this dramatic credit reduction. When the time horizons of business valuation align, the relative importance of the value of growth options decreases in credit allowance decisions. When future is completely irrelevant, liquidation values are the only drivers of capital allowances. Thus, high market-to-book value corporations, such as entrepreneurial businesses, might be affected by a lack of credit that is more closely related to invested assets (book values) than to growth opportunities (market values). The actual impact of this negative loop emerges only in the long term, since the lack of flows from missed growth opportunities leads to poor capital accumulation.

This book makes a slightly different proposal. Given the basic characteristics of the entrepreneurial business cycle explained above, the differences between equity and debt finance are less relevant because of market incompleteness, while the expertise of the financial intermediary in business advisory services is critical to the soundness of entrepreneurial finance transactions. Investment in an entrepreneurial business must be intended as a contingent claim finance transaction,

which contributes to the completion of the entrepreneurial cycle. The efficacy of this contribution cannot depend on the overall amount of money invested; it also requires a knowledge contribution to entrepreneurial competences and their incorporation into the firm. The entrepreneurial finance investor is typically a partner, even if a relatively small amount of money is invested compared with other investments. The partner cannot be a passive investor providing money and waiting for the risky returns, since the specific agency problems that may stem from the investment require active monitoring. Moreover, the specific capability to modify financial contracts based on evolving entrepreneurial needs is required; thus, a skilled intermediary is needed for successful investment.

The new approach requires a clear understanding of why the difference between equity and debt is less relevant in entrepreneurial financing and of the financial mechanics that contribute to value emersion over the course of the entrepreneurial cycle. The key element seems to be that market incompleteness makes computing the fair value of the entrepreneurial business and including their competence value very difficult. This forces financial intermediaries to refer to book values alone, thus dramatically reducing the underlying value used to arrange the financial transaction. As previously discussed in this book, entrepreneurial businesses have very high fair-market-to-book-value ratios, so an asset-backed approach to funding may be severely deficient. A competence-driven approach to financing entrepreneurship would be preferable, even if highly skilled intermediaries are required.

1 The Equity Capital Contribution to Competence Value Emersion

In the traditional approach, the use of equity capital to fund an entrepreneurial business relates to higher risk tolerance, which is supposed to characterize such a capital investment. In fact, the two-fund separation theorem suggests that risk stems from the asset side alone, while liabilities divide the asset risk between debt and equity. The weighted average risk of debt and equity equals the overall asset risk: debt bears risk below the asset level, while equity compensates by bearing risk over the asset level. Only tax inefficiencies bias the formula, typically making debt advantageous by allowing the deduction of interest paid. The following

formula depicts the standard CAPM relations between the risks on the asset and liability sides of financial reports:

$$\beta_{asset} = \beta_{debt}(1-t)\frac{D}{D+E} + \beta_{equity}\frac{E}{D+E}$$

where D is the market value of debt, E is the market value of shares, and t is the corporate tax rate.

According to the above formula, it is very important to understand that the relative contribution of debt and equity to overall business funding is not related to the risk level shared by each funding source. In other words, funding 60% of financial needs through debt does not imply bearing 60% of the risk of the corporate assets. In the case of debt, the risk as expressed by a debt beta that is lower than the risk expressed by the asset beta, even if debt represents a larger contribution to the overall financing of the business. Accordingly, equity must compensate by absorbing a larger quota of risk as generated by leverage ratio (debt vs. equity values). When the leverage ratio is excessively high, the risk-sharing mechanism may not work properly, so equity holders may abandon the company and leave debtholders to bear all the risk. In other words, when the amount of debt is too high, its contingent risk may rise to unexpected levels; the economic nature of debt is then transformed into that of equity. This is a first key point you must bear in mind to understand the preferences of equity capital in entrepreneurial finance transactions.

You must consider another key point from the previous formula. The debt-to-equity puzzle is solved by supposing that the investor's risk aversion refers only to the amount of risk; the breakdown of the components (i.e., the drivers and their correlation matrix, as described in previous chapters) of overall risk is less relevant to identifying the optimal leverage ratio. As we have seen in previous chapters, in entrepreneurial finance transactions, investors are interested in the qualitative components of business risk, since they tend to invest in firms over which they claim to have control capabilities. Accordingly, they invest in risky businesses when the specific mix of sources of risk is more consistent with their own risk appetite. Equity is a legal instrument that allows you to invest in a specific business profile while maintaining the possibility of contributing to risk control; this is another good reason for the preference for equity capital in entrepreneurial investments. On the other hand, the legal risk control

capability given to equity refers to risks stemming from assets only. No control is given over risks stemming from the entrepreneur's behavior. It is well-documented that debt capital may be a superior tool (Ross 1997) because it incentivizes the entrepreneur's productivity and solves agency conflicts. This supports the sustained preference for debt capital in entrepreneurial investments.

The tricky choice between equity and debt relates to the stage of the entrepreneurial life cycle. In fact, control over asset- and behavior-generated risks is very different in each of the three stages.

In the E-seed stage, the entrepreneur needs a mentor who can help cover financial needs and provide guidance during the entrepreneur's period of knowledge accumulation. This is why a (legal) shareholder does not fit the needs of the business; foremost, the entrepreneur needs a partner. This is why business angels are most relevant in the E-seed stage.

In the E-pullulating stage, the risk of inefficient dissemination of knowledge into the corporate organization suggests a wider role for debt capital in financing. This may take the form of equity capital provided by a venture intermediary that continues to support the evolving knowledge by providing additional know-how to the know-why acquired in the first stage. Debt capital may be acquired to support financial needs arising from the greater relevance of assets; moreover, it is particularly useful for controlling agency problems and improving overall organizational productivity.

In the E-completing stage, the role of equity financing is critical. The company can better market its securities due to its clear performance trend. Accordingly, this stage focuses on solving information risk in the financial market and normally concludes when the firm is listed. Essentially, the payoff risk is more stable, and the quantity of risk is more relevant than the qualitative components. Thus, equity is the key element in efficiently concluding the overall cycle.

We can conclude that traditional equity financing is relevant only in the last stage of the entrepreneurial cycle, that is, the stage in which the value emersion process becomes critical. In the other two stages, value creation is more relevant; therefore, equity finance is used, mainly because its legal characteristics provide a closer fit to the firm's true requirements. In fact, in the first two stages, it would be more appropriate to use contingent claim finance tools, which can be designed according to the basic characteristics of the return-to-risk profile of the entrepreneurial business.

From a very practical perspective, this means the use of some structured products that can supply the financial resources required by the business, while permitting the investor to actively participate to entrepreneurial development. In the meantime, a non-financial agreement between the entrepreneur and the investor will have to be found in order to adapt to the evolving necessities of the agency relation established by providing entrepreneurial finance support.

Structured debt financing could be better suited to these firms, as explained in next section.

2 The Debt Capital Contribution to Competence Value Emersion

This book argues that debt financing is a more efficient source of financial resources for entrepreneurial businesses, particularly during the E-pullulating stage. This is a direct consequence of the possibility of structuring debt contracts with the clauses (including covenants) that best fit the risk control requirements of the entrepreneurial business. It is also a consequence of the superior ability of debt financing to stimulate the entrepreneurial contribution to overall productivity, thus controlling potential agency problems that may arise between the investor and the entrepreneur in the financing transaction.

In previous sections, we have learned about the function of time in the entrepreneurial business cycle. Since time is the gateway to the depersonalization of the entrepreneur's skills, which transforms them into a corporate hallmark, it is widely supposed that equity capital is a more efficient instrument because of its infinite duration. Such an extended duration may reduce the entrepreneur's activity during this stage; accordingly, the fixed time horizons that characterize debt contracts may help stimulate the process, while any required extension in maturity may be negotiated according to the needs of the business. Moreover, the opportunity to design debt contracts with unique payoffs at maturity (similar to zero-coupon bonds) may reduce the risk of cash flow problems that can trigger default.

Debt maturity and covenants are the best tools for adapting debt capital to the true needs of the entrepreneur. Debt capital can be designed and accurately maintained to achieve the greatest contribution to the conclusion of the entrepreneurial cycle. However, from a legal perspective, legal frameworks may not permit the inclusion of the required clauses.

3 The Financial Intermediaries that Allow Value Emergence

The main feature that distinguishes entrepreneurial finance transactions from corporate finance transactions is the distinctive contribution of knowledge provided by the investor. In each of the three stages of the entrepreneurial business cycle, the investor must act as the entrepreneur's partner. While the invested money may be fungible, the expertise brought into the entrepreneurial company during the financing period is not. A bundle of money and expertise distinguishes a superior entrepreneurial finance transaction and increases the probability of success. Such expertise is clearly connected to the risk aversion profile of the investor, which permits greater control of the risk embedded in the entrepreneurial business. This is why financial intermediaries that specialize in entrepreneurial financing must have specific competences in the focal field; this is also why they may differ across the three stages of the entrepreneurial business cycle. Intermediaries must be hybrids of consulting firms and banks and trust in their advisory services when investments are made during the first stages.

The development of best practices and routines has made financial intermediaries that specialize in entrepreneurial financing increasingly rare. In fact, practices tend to develop into rigid routines based on broader historical experience, while each entrepreneurial finance transaction requires a higher level of comprehension and design. This makes entrepreneurial financing initiatives expensive and requires financial intermediaries to provide both financial and other resources to support the business. Finally, the more expertise is provided by the intermediary, the more difficult it will be to govern the agency relationship that stems from the financing initiative.

One of the most troubling elements of financial practice is matching business requirements within the legal framework. This is of the utmost relevance in entrepreneurial finance transactions, especially for the boundaries between debt and equity. The concept of risk is still the root: debt is typically thought of as low-risk investment, while equity is high-risk investment. Still, there is a quantitative difference, as in the case of risk aversion, since no other qualitative distinctions are supporting it. Accordingly, an intermediary that specializes in debt financing tends to be considered low risk, while one specializing in equity financing is considered high risk. Since the overall level of corporate risk is thought to exist

ex ante, no crafting of risk occurs when financing is considered; only corporate risk management institutions will provide that service. The given risk is determined by the nature of the investment: the firm's mix of assets forms the basis of such an assessment. Accordingly, the practices adopted by financial intermediaries tend to be oriented toward asset-backed financing, which differs considerably from entrepreneurial finance that requires a competence-driven approach to allow value emergence and financial market completion.

4 Competence Value and Debt-Maturity Decisions

In recent times, leverage has increasingly been considered evil; the previous discussion of the intense focus on the quantity of risk rather than the quality of risk may help explain why. The high leverage that spread into all areas of the economic system contributed to the high volatility that characterized the recent financial crisis. Thus, leverage reduction is often thought to be the solution to the crisis; this tendency reduces financial resources to entrepreneurial business in favor of short-term competitive firms, as noted in the TV area (see the Chapter 5). Corporations are no exception to this rule: high corporate leverage generated bankruptcy procedures that reduced economic welfare and generated further corporate distress, leading to stagnation.

This is a direct consequence of leverage analysis that is typically focused on the quantity of debt; the framework used in the analysis is neoclassical. At a more academic level, both the absolute amount of debt capital raised and its level relative to equity capital are considered. This approach aims to solve the capital structure puzzle. At a more practical level, the focus is on the method of leverage computation, that is, whether to rely on book or market values. As these values can be very different, the results of the two computation approaches may strongly bias subsequent decisions. In fact, the higher the goodwill embedded in the equity market values, the wider the gap in the leverage ratio computed using the two methodologies. The book value methodology of computing leverage is particularly common in standard banking practices to allocate credit to SMEs. In the case of unlisted companies (as SMEs generally are), such an approach is not supported by comparable market values of equity. This overestimates the leverage ratio and reduces capital attraction, while regulatory frameworks such as the Basel II (and the forthcoming Basel III) tend to exacerbate this bias. The status of artificial capital rationing generates a paradox: the stronger is the constraint

to adopting book values, the higher the computed leverage and the smaller the new capital allowances will be. Companies are then forced to restructure their liabilities by adding new equity and use flows to pay existing debt rather than to invest in corporate performance. In this way, value creation is missed (on the asset side) as the most powerful tool for controlling leverage growth!

This section suggests that debt quality also matters and that debt maturity is a basic qualitative aspect of capital structure analysis. At the corporate level, maturity mismatch increases unexpected risk. Shortening the maturity of financial liabilities incentivizes more liquid asset investments, which are usually less productive. Moreover, the shorter is the debt maturity, the higher the probability of corporate default given the duration of the assets. Since the seminal work of Modigliani and Miller (1958), the qualitative duration of debt has been missed by referring to irredeemable debts (i.e., consols): debt is supposed to perpetuate according to the quality of assets. This means that the duration puzzle of debt is supposed to be solved by financial markets that are perfectly efficient and complete, which is far from true among private companies, particularly SMEs. The best practices for financial advisory services make no exceptions to the above theoretical bias, both in the case of book value analysis, since the debt-to-equity ratio computation is usually undistinguished by debt maturity, and in the case of market value analysis, since the deleveraging of betas in practice usually supposes debt to be a perpetuity.

Only very recently have studies demonstrated that evaluating the qualitative profile of debt allows you to impact corporate performance; see, for example, Harris and Raviv (1991). Conversely, some drivers of corporate performance seem to impact maturity choices, as Guedes and Opler (1996) demonstrate for a wide range of bonds and notes. The seminal work by Leland and Toft (1996) excludes debt maturity as a driver of the leverage puzzle due to the "endogenous bankruptcy" problem (i.e., an agency approach to risk sharing). Hence, the two-fund separation theorem is overcome by considering debt quality through its maturity.

Leland and Toft's approach is our starting point in order to better understand whether (i) there is a particular relationship between debt maturity and firm performance, (ii) entrepreneurial businesses and SMEs have special requirements according to the qualitative profiles of their financial debts, and (iii) it is possible to improve competitive performance by adjusting the maturity of debt.

—§—

The maturity of any funding solution is truly irrelevant only in a very efficient and complete financial system. In this case, corporations are simply required to be selectors of investment projects with positive net present values. Then, financial markets will solve any duration mismatch in cash flows by funding the required gap. In analytical terms, this means that the present value of corporate assets equals the sum of any contingent financial claim, as depicted in Eq. 35. The only constraint is that V > B in order to avoid the default zero.

$$V = B + S \qquad subject\ to\ V > B \tag{35}$$

where V is the enterprise value, B is the debt value, and S is the equity value.

V, B and S are the present values of any possible mix of expected free cash flows satisfying the V > B constraint. This means that no special restrictions are required for cash flows or time maturities, as explained by Eq. 36:

$$\sum_t \frac{FCFO_t}{(1+k)^t} = \sum_t \frac{FCFD_t}{(1+r_d)^t} + \sum_t \frac{FCFE_t}{(1+r_e)^t} \forall \text{FCFO}, \forall \text{FCFD}, \forall \text{FCFE} : V > B \tag{36}$$

where FCFO is the free cash flows from operations, FCFD is the cash flows for debt service, FCFE is the free cash flows to equity, k is the WACC, r_d is the cost of debt capital, and r_e is the cost of equity capital.

Debts are negotiated according to their ability to reduce the cost of capital. Debt maturity becomes irrelevant, since the absolute quantity of debt is fixed (at B). This calculation is shown in Eq. 37 for the case of a two-maturity horizon:

$$B = \sum_t \frac{FCFD_t}{(1+r_d)^t} = \sum_{t=1}^{x} \frac{FCFD_t}{(1+r_x)^t} + \sum_{t>x} \frac{FCFD_t}{(1+r_y)^t} \qquad \forall x : \text{V} > \text{B and } [\min(\text{r}_\text{d})] \tag{37}$$

where r_x is the cost of debt capital in the first stage ($1 < t \leq x$), and r_y is the cost of equity capital in the second stage (t > x).

You may refer to this approach as an *extended Modigliani and Miller* (M&M) model, since it adds the irrelevancy of the maturity of debt (i.e., a debt quality component) on the value of the corporate investments to the irrelevancy of the quantity of debt (i.e., the leverage ratio). According to this approach, (i) the debt maturity puzzle is solved by markets; (ii) transaction costs (including taxes) are irrelevant to the capital structure, and no maturity arbitrage exists; (iii) the probability of default is exogenous, that is, it is driven only by the business risk that could drive V below B. The cost of debt (r_d) is related only to the probability of default, as indicated in Eq. 38:

$$r_d = f[prob(V < B)] = g[Var(V)] \tag{38}$$

where Var(V) the variance of the value of corporate assets.

Herein, the separation theorem is fully applied: any financial policy cannot impact on enterprise value. In fact, it predates any decision, while choices about capital structure (debt-to-equity ratio) and qualitative capital structure (debt maturity) are driven only by arbitrage opportunities (i.e., no adjustment and agency costs impacts). Even firm size has no effect on capital structure decisions. This is an ideal model indeed; however, our analysis will refer to the main gaps between this model and reality.

Market inefficiencies can impact capital structure decisions, so debt maturity irrelevance must be reconsidered, as in the orthodox M&M approach. Information asymmetry, transaction and agency costs, the probability of default and the bargaining power of small companies may link business value and debt maturity.

The case of information asymmetry is the easiest to formalize. Debt funders prefer a higher information risk premium on the cost of debt capital funding less predictable cash flows. Higher risk premiums in cases of longer maturities (Mantovani 2012) tend to shorten the duration of debt and to increase liquidity constraints. Moreover, WACC increases because of the higher embedded risk premium and the default probability, a direct consequence of the higher probability of a mismatch between corporate cash flows and the cash required for the repayment of debt (i.e., FCFO < FCFD).

Referring to the two maturities model depicted in Eq. 37 and supposing the second horizon to be affected by higher information risk, the value of B is defined by Eq. 39:

$$B* = \sum_{t} \frac{FCFD_t}{(1 + r_d^*)^t} = \sum_{t=1}^{x} \frac{FCFD_t}{(1 + r_x)^t} + \sum_{t>x} \frac{FCFD_t}{(1 + r_y + IRP)^t} \tag{39}$$

If the information risk premium is positive, $r_d^* > r_d$ will always be true. Accordingly, the only way to reduce r_d is to reduce the overall debt duration by reducing the weight of debt in the second period. Given a fixed information risk premium and a specific level of market risk aversion, the overall duration should be limited to the first time horizon.

This impacts the capital structure, reducing B to the B* level through (i) the reduction of the quantity of debt (B/S ratio) so that $V > B*$ and the restoration of an optimal default probability; (ii) the reduction of debt maturity in order to pay the lowest cost of debt ($r_d \Rightarrow r_x$) and an increase in the probability of default generated by cash flow mismatches (FCFO<FCFD) on the *x*-axis; (iii) the payment of higher interest rates on longer maturity debt and a higher probability of default due to cash flow mismatches on the *y*-axis. An increase in WACC will follow all the previous solutions, along with further impacts due to agency problems. Managerial behaviors, such as underinvestment, "milking" solutions and efficiency rebounds of corporate operations due to debt burden could impact WACC through indirect bankruptcy costs.

Transaction costs could also be relevant. The size of a transaction could dilute the real costs of the negotiation, since some of them are unrelated to the total amount and incurred for other reasons, such as time (e.g., legal costs) and the number of transactions (e.g., fixed taxes). This contributes to a size-specific capital rationing effect that may impact WACC, particularly for SMEs. For these firms, specific information asymmetries usually increase the absolute level of transaction costs, further increasing the previously depicted effects on debt maturity.

The firm size can determine bargaining power in financial transactions. Larger companies may prefer short-term debt to reduce interest payments and to exploit their bargaining power. Such bargaining power can be even generated by real business performance. Companies with better return-to-risk profiles can benefit from maturity reductions and use their debt-maturity policy to signal their strength to financial markets.

In terms of the previous equation, Eq. 38, we conclude that:

$$WACC = f[r_d; prob(V < B*)] = g[IRP^-; x^{+/-}; Var(V)^+; Agency^+; B^-] \quad (40)$$

You may refer to this as the Harris and Raviv (H&R) approach, since these two authors contributed (in 1991) to solving the puzzle.

None of the previous models consider the relations between asset volatility and capital structure because they assume that default may arise from Var(V), which pushes V below B, leading creditors to ask a court to declare the company default. Var(V) captures only the *exogenous* sources of the risk of corporate default. In fact, *endogenous* sources are considered in the Leland and Toft (L&T) approach. This model is very useful for designing debt solutions to fund entrepreneurial businesses.

In their model, endogenous bankruptcy occurs when shareholders decide to generate default by aborting their equity contributions to hedge a mismatch in corporate cash flows. This condition might arise each time the FCFO is insufficient to cover the due FCFD; the equity owners could avoid contributing to the difference if the expected corporate ROE is lower than the equity cost of capital. Please note that this can happen even if V > B (i.e., without exogenous default conditions).

The L&T approach can be formalized in terms of Eq. 36 of the flow-to-equity view, supposing that at time t = *x*, the conditions for an endogenous bankruptcy arise (but V > B):

$$\begin{aligned} S &= \sum_t \frac{FCFE_t}{(1+r_e)^t} = \sum_t \frac{FCFO_t}{(1+k)^t} \\ -\sum_t \frac{FCFD_t}{(1+r_d)^t} = S &= \left[\sum_{t=0}^{x-1} \frac{FCFO_t}{(1+k)^t} + \frac{FCFO_x}{(1+k)^x} + \sum_{t=x+1}^{\infty} \frac{FCFO_t}{(1+k)^t}\right] \\ &\quad - \left[\sum_{t=0}^{x-1} \frac{FCFD_t}{(1+r_d)^t} + \frac{FCFD_x}{(1+r_d)^x} + \sum_{t=x+1}^{\infty} \frac{FCFD_t}{(1+r_d)^t}\right] \end{aligned} \quad (41)$$

New equity capital will flow into the company if and only if Eq. 42 is satisfied at time x:

$$\Delta S_x = FCFD_x - FCFO_x = \left[\sum_{t=x+1}^{\infty} \frac{\Delta FCFO_t}{(1+k)^t}\right] - \left[\sum_{t=x+1}^{\infty} \frac{\Delta FCFD_t}{(1+r_d)^t}\right] = \left[\sum_{t=x+1}^{\infty} \frac{\Delta FCFO_t}{(1+k)^t}\right] - 0 \tag{42}$$

Debt maturity design helps reduce endogenous bankruptcy by controlling cash flow mismatches. The previous equations can be synthesized by considering a threshold level of the enterprise value (V*) under which endogenous bankruptcy occurs. Such a value must also be compared with the par value of debt (D). If V* is very far below D, as represented in Eq. 43, it is possible to avoid endogenous default:

$$V* < V < D \tag{43}$$

In fact, a low level of V* still incentivizes equity owners to fund the company given certain debt-to-equity ratios and debt maturities. Please note that default is avoided even if the potential condition (V<D) occurs. The longer is the debt maturity, the more probable this situation. If the debt maturity of D decreases to zero, endogenous bankruptcy can take place even in cases where V > D should the ΔS be insufficient in terms of the acquired potential flow to equity depicted in Eq. 42.

CHAPTER 7

The Next Step: From Asset-Backed to Competence-Driven Financial Practices

Abstract Modern entrepreneurial finance practice needs to rethink traditional corporate finance practice from an asset-backed to a competence-driven framework. This is a direct consequence of the critical role of human capital (chiefly, the entrepreneur's role) to the long-term performance of any modern business. Short-termism in the financial system may be a direct consequence of the inability to have sound estimation of the competence value; a problem that this book attempts to solve. But wider contribution of the human capital is required inside financial intermediary's business, too. In fact, the traditional trade-off between debt and equity capital needs to be replaced by the new asset-in-place vs. competence-based articulation of financial products. This final chapter gives some insights about these practices to fund the entrepreneurial life cycles.

Keywords Asset-backed financing · Competence-driven financing · Financial practices

Funding small business is becoming increasingly difficult for all the reasons noted in this chapter. The difficulties of designing debt contracts consistent with the entrepreneurs' financial needs, particularly regarding the time horizon, explain this trend. A lack of capital assets requiring leverage along with a lack of information flows to allow growth monitoring are important sources of financial difficulties for entrepreneurial businesses, since they simply suggest the diversion of corporate funding from debt to equity capital. When a

G.M. Mantovani, *The Financial Value of Entrepreneurship*,
DOI 10.1057/978-1-137-36537-8_7

business is critically dependent on skills and human capabilities, credit fluctuations have severe consequences.

The short-termism of the financial system contributes dramatically to credit crunches. When the time horizons of business valuation lengthen, the relative importance of the value of growth opportunities is smaller in credit allowance decisions. When the future is fully irrelevant, only the liquidation values drive capital allowances. Thus, high market-to-book-value corporations might be affected by a lack of credit that is driven by its invested assets (book values) than by its growth opportunities (market values). The actual impact of this negative feedback loop emerges only over the long term, since a lack of flows from missed growth opportunities leads to a lack of capital accumulation.

In Chapter 3, we learned that the magnitude of the market-to-book ratio is strongly related to four items: (a) the replacement (i.e., liquidation) value of assets, (b) the gap between corporate returns and the cost of capital, (c) the duration of such a gap, and (d) the entrepreneurial ability to persist despite the previous conditions. While market efficiency usually affects the perception of items (a) and (b), market completeness impacts the perception of items (c) and (d). Rules for regulating bank procedures in credit allowances concentrate increasingly on items (a) and (b) to reduce inefficiencies, a very comfortable approach when (c) and (d) detection is guaranteed. However, debt allowance procedures for items (a) and (b) detection can affect (c) and (d). Is it possible to observe a lack of debt capital to sustain corporations with few assets but high values? This is the basic research question we try to answer in this book using the experience of high-performing corporations in northeastern Italy.

Entrepreneurial firms are hit even harder by the previous crowding-out effects due to their higher concentration of investments in intangible assets and human capital. Their credit ratings are often lower because of their inability to obtain debt capital from the banking system due to the intangibility of their investments and market incompleteness. A lack of assets reduces the debt capital available to cultivate competences inside the corporation, while equity capital is fully concentrated in intangible and competence efforts. However, both debt and equity capital are diverted from entrepreneurial finance transactions because of their poor return-to-risk profiles, mainly due to excess perceived risk and high investor risk aversion. The announcement of the Basel III standards is depicted as a “countdown” to the end of financial support for entrepreneurship. No one is able to definitively say whether these problems stem mainly from methodology (i.e., the adoption of specific techniques of financial analysis) or from assessment (i.e., the concepts of entrepreneurial business valuation and management).

The lack of competence value measurement, which this book helps resolve, is the fundamental source of the above problems. It must be recognized that neither professionals nor academics have reached a consensus regarding the solution to the puzzle; they increasingly tend to blame each other for the failure to resolve the conflict. The application of financial analysis tools demonstrates a kind of schizophrenia: it recognizes the importance of following a policy based on market values but provides criteria based on book values only. The problem of the market-to-book value gap persists, even if in this case the feedback loop is clear: no measurement means no assessment, which means no business decisions and no investment, leading to no market values and no measurement opportunities.

In this section, a possible relationship between competence value and debt funding in small businesses is proposed; the empirical case of the TV area helped us to detect the drivers of the problem and possible solutions. The complexity generated by anomalies and asymmetries in the Italian case require exceptional gymnastics to develop alternative approaches to more efficient banking support for entrepreneurship. How can Italian corporations improve their competence values even if the banking system has serious deficiencies in its detection? The empirical results are encouraging; banking capital flows support the assets in place, while a considerable share of commercial debts support competence value building. Commercial debts reflect sizeable amounts of working capital, with the means of competence increasing along the value chain.

1 We Need more Competence-Driven Finance!

To better understand the connection between competence value and financial debt, we estimated the total amount of debt for any industry. According to Italian law, companies are obliged to publish financial reports, but the details of their balance sheets (e.g., debts) are not compulsory for smaller companies. Regarding the total amount of debt, smaller companies provide the details of their debts in a separate document that is not digitalized. Producing detailed figures for financial debts requires computation for a subset of our sample composed of companies for which financial details are available in digitalized form. Following the methodology for competence value estimation, the figures must refer to the study period (2004–2009), producing a subset of 663 corporations. This subset of the TV area firms (22%) remains representative, so we can compare the estimates for the industries in previous section with the results we estimate here. For any corporation, the Q and T ratios were

computed by referring to 5-year data set; this limited the subset to 582 companies for which the analysis could be completed.

To conduct the analysis, the total amount of financial debt (i.e., excluding commercial debt) is estimated net of liquid financial assets, so the net financial position (NFP) will be considered. Table 7.1 reports descriptive statistics for the subset compared to the entire sample. Over the analyzed period, 390 corporations (58.82% of the subset) increased their NFP, thus reaping resources from the banking system, while the remaining 273 companies reduced NFP, sending back money to the financial market. To reduce bias in the analysis, the NFP changes were computed as averages (i.e., per each company); in this way, we can better compare the NFP figures with the Q and T ratios.

To focus on the research question, the next table presents the data analysis by average change in the NFP.

Table 7.2 confirms the reduced bias in the dataset of 582 companies vs. the entire TV sample. However, the same table provides more dramatic information: a negative relationship between the Q ratio and changes in NFP (i.e., ΔNFP). The connection to the T ratio remains unclear. A possible explanation is provided by pecking-order theory: excess returns generated by companies are used to reduce debt. However, another explanation could be related to the low efficiency of capital allocation by the banking system, aiming to invest more capital in firms presenting collaterals (i.e., assets) instead of competitive returns.

The nature of the relations between debt allowances and ratios is confirmed in Table 7.3, which reports t-statistics for the ratios along with their significance: only the extreme cases of ΔNFP > EUR 500,000 and <- EUR 500,000 are significant at 95% for the Q ratio.

The previous results suggest that there are other drivers of credit allowances. Since those drivers are not fully correlated with corporate returns over either the short or long term, we investigate whether they could be correlated with risk indicators or asset support. To conduct the regression analysis, the subset sample has to be reduced to 580 companies, since two corporations do not have a full set of relevant data. The following indicators we use to detect risks:

– Corporate exposure to the risk of sold quantities was analyzed by computing the operating elasticity of the firm (GLO) driven by the relative weight of fixed costs over the total operating costs of the corporation. The figures were computed according to the formulas presented in previous sections.

Table 7.1 Statistics of the 663-companies' subset

Industry (translation of the original Italian name)	*ATECO Code*	*# of corporations*	*Q-Ratio*	*T-Ratio*	*frequency of Q > 1 firms*	*frequency of T > 1 firms*	*#corp*	*Industry coverage*	*#coΔPFN > 0*	*#coΔPFN < 0*	*#co. With positiveΔPFN*	*average ΔPFN*	*average ΔPFN*	*average ΔPFN per company*
Agriculture and hunting services, forestry	01;02	63	0.4382	1.3566	32.92%	19.72%	13	20.63%	9	4	69.23%	1,004	−409.87	569.30
Food and Drink	10;11	115	1.2410	1.2299	56.68%	18.04%	47	40.87%	27	20	57.45%	449.37	−382.31	95.47
Manufacture of textiles	13;14.3	61	0.4131	1.1274	24.16%	36.26%	10	16.39%	5	5	50.00%	1,854.55	−728.48	563.04
Manufacture of clothing, dyeing, tanning fur	14.1;14.2	49	0.8605	1.3579	45.40%	36.51%	10	20.41%	5	5	50.00%	294.65	−450.30	82.82
Manufacture of leather goods made of wood, cork, straw	15	53	0.5577	1.2288	27.51%	56.23%	16	30.19%	8	8	50.00%	738.42	−136.72	300.85
Manufacture of wood, cork, straw	16	104	0.5346	1.0293	28.93%	31.57%	25	24.04%	16	9	64.00%	494.64	−323.27	200.19
Manufacture of paper and paper products	17	35	0.6065	0.9537	28.97%	42.88%	14	40.00%	6	8	42.86%	720.20	−445.90	53.86
Publishing, printing and reproduction of recorded media	18;58.1	32	0.9120	1.1209	46.43%	37.05%	3	9.38%	3	0	100.00%	614.83	n.d	614.83

(*continued*)

Table 7.1 (continued)

Industry (translation of the original Italian name)	*ATECO Code*	*# of corporations*	*Q-Ratio*	*T-Ratio*	*frequency of Q > 1 firms*	*frequency of T > 1 firms*	*#corp*	*Industry coverage*	*#coΔPFN > 0*	*#coΔPFN < 0*	*#co. With positiveΔPFN*	*average ΔPFN*	*average ΔPFN*	*average ΔPFN per company*
Manufacture of chemicals and artificial synthetic fibers	20;21	35	1.5666	1.3534	63.84%	25.93%	11	31.43%	5	6	45.45%	292.28	−165.49	42.59
Manufacture of rubber and plastic products	22	96	0.8177	1.2594	43.37%	32.67%	23	23.95%	13	10	56.52%	736.77	−198.09	330.31
Manufacture of other non-metallic mineral processing	23	79	0.5123	1.3472	24.96%	57.58%	25	31.65%	14	11	56.00%	790.29	−495.22	224.67
Metallurgy - Manufacture and processing of metal products except machinery and equipment	24;25	314	0.9777	1.2198	49.14%	39.23%	75	23.89%	40	35	53.33%	513.74	−297.14	135.33
Manufacture of computers and electronic and optical products, electrical appliances, etc.	26	24	0.6858	1.0578	37.26%	30.06%	4	16.67%	2	2	50.00%	210.19	178.24	15.98

Manufacture of electrical and non-electric domestic appliances	27 exept 27.5	62	0.8497	0.9332	46.48%	6.98%	17	27.42%	7	10	41.18%	310.09	−913.55	409.70
Manufacture of machinery and equipment	28; 27.5;33.12	192	0.7140	1.2818	37.355	48.55%	44	22.92%	27	17	61.36%	702.09	−1,003.59	43.08
Manufacture of motor vehicles, trailers and semitrailers	29.30	29	0.9439	1.2593	47.91%	34.61%	9	31.03%	5	4	55.56%	409.71	−97.17	184.43
Manufacture of other transport equipment	31	237	0.4026	0.8536	25.795	15.43%	86	36.29,%	50	36	58.14%	559.15	−655.32	50.77
Manufacture of furniture	32	38	0.7867	1.2205	40.94%	42.87%	10	26.32%	5	5	50.00%	1,419.42	−406.57	506.42
Other manufacturing	41;42;43	310	1.0267	1.3729	51.005	43.43%	38	12.26%	30	8	78.95%	759.30	−203.04	556.71
Building societies	45	94	0.9928	1.2014	49.805	14.13%	23	24.47%	14	9	60.87%	591.22	−317.54	235.62
Trade, maintenance and repair of motor vehicles and motorcycles	46	483	1.0295	1.3755	50.92%	32.06%	87	18.01%	52	35	59.77%	473.90	−367.99	135.21
Commerce wholesale and commission trade, motor vehicles and motorcycles	47	150	0.9132	1.2593	47.795	13.06%	26	17.33%	18	8	69.23%	422.74	−290.96	203.14

(*continued*)

Table 7.1 (continued)

Industry (translation of the original Italian name)	*ATECO Code*	*# of corporations*	*Q-Ratio*	*T-Ratio*	*frequency of Q > 1 firms*	*frequency of T > 1 firms*	*#corp*	*Industry coverage*	*#coΔPFN > 0*	*#coΔPFN < 0*	*#co. With positiveΔPFN*	*average ΔPFN*	*average ΔPFN*	*average ΔPFN per company*
Retail (excluding motor vehicles and motorcycles), repair of personal and household goods; Land Transportation, pipeline transport, storage and auxiliary transport activities	49;52	80	0.6306	0.8767	37.30%	12.04%	15	18.75%	10	5	66.67%	412.06	−66.76	252.46
Hotels and restaurants activities	55;56	27	0.2677	1.2891	27.25%	29.47%	3	11.11%	0	3	0.00%	n.d	−132.21	132.21
Computer and related activities	62;63;95.11	65	1.5651	1.4825	62.53%	32.91%	6	9.23%	4	2	66.67%	233.24	−56.39	136.70
Real estate	68	115	0.6301	1.4380	36.98%	33.04%	11	9.57%	8	3	72.73%	2,324.45	−684.82	1,503.74
Professional services	69;70;71;73;74	76	1.2434	1.5666	55.29%	30.41%	7	9.21%	3	4	42.86%	280.66	−412.63	115.50,

Recreational Cultural and Sports	90;91;92;93;59.1	28	0.3396	n.a.	33.33%	n.a.	5	17.85%	4	1	80.00%	121.75	–256.97	46.01
Treviso's District as a total(weighted average)	**Treviso's District as a total**	**3046**	**0.7773**	**1.2818**	**42.11%**	**31.58%**	**663**	**21.77%**	**390**	**273**	**58.82%**	**612.76**	**415.37**	**189.41**
Minimum			0.27	0.85	24.16%	6.98%	3	9.21%	0	0	0%	121.75	–1,003.59	–409.70
Maximum			1.57	1.57	63.84%	57.58%	87	40.87%	52	36	100%	2,324.45	–56.39	1,503.74
Min-Max			1.30	0.71	39.84%	50.60%	84	31.66%	52	36	100%	2,202.70	947.20	1,913.44
Average			0.80	1.22	41.44%	31.62%	24	22.19%	14	10	57%	656.82	–373.57	223.59
Standard deviation			0.34	0.18	12.92%	12.92%	24	9.16%	14	10	17%	498.88	246.60	344.97

Source: Our processing of data from the above data sources and algorithms from Teofilo Intato Foundation

Table 7.2 Statistics of the debt raising activities for the 582-companies' subset

Ranges of ΔPFN		average Q-Ratio	average T-Ratio	ΔPFN (avg)	companies
	Δ PFN–500	1.10	1.94	–1,399	49
	–500 < Δ PFN <–250	0.90	1.96	–354	56
	–250 < Δ PFN < 0	0.89	2.19	–105	141
	0 < Δ PFN < 250	0.64	1.52	101	162
	250 < Δ PFN < 500	0.63	1.89	376	68
	Δ PFN > 500	0.55	2.16	1,446	106
	Average value for 582 companies	**0.75**	**1.92**	**158**	**582**
	Average value for 28 industries	**0.80**	**1.22**	**106**	**28**
	Average value for TV's District	**0.78**	**1.28**	**133**	**3046**

Source: Our processing of data from the above data sources and algorithms from Teofilo Intato Foundation

Table 7.3 T-statistics relating to the ratios of the 582-companies' subset

		Q-Ratio	*T-Ratio*	*Specific Q-Ratio*	*Specific T-Ratio*
Ranges for ΔPFN	Δ PFN <–500	–1.63	–0.75	2.44*	0.04
	–500 < Δ PFN < –250	0.40	–0.51	1.07	0.12
	–250 < Δ PFN <0	0.44	–0.11	1.51	0.76
	0 < Δ PFN < 250	1.07	0.59	–1.59	–1.27
	250 < Δ PFN < 500	0.95	0.93	–1.69**	–0.07
	Δ PFN > 500	–1.98*	–0.50	–3.32*	0.52
	TV's District Average	**–0.53**	**0.68**	**0.41**	**–3.25***

*95% confidence

**90% confidence

Source: Our processing of data from the above data sources and algorithms from Teofilo Intato Foundation

– Corporate exposure to the risk of price volatility was analyzed by computing the required elasticity of demand to maintain the EBIT level needed for a reduction of 1% in the selling price. The figures were computed according to the previously presented formula for GLP.

– Corporate exposure to the risk of working capital influence on corporate performance was analyzed by computing the ratio between operating working capital and revenues, as in the Eq. 44:

$$CCC\_F = \frac{CCC}{REV} \quad [44]$$

where CCC is operating working capital, i.e., working capital excluding financial figures, and REV is revenues.

– Corporate exposure to default risk was analyzed by computing total debt to equity, including leverage generated by commercial debts.

The results allow us to better understand the previous evidence.

2 We Chiefly Have Asset-backed Finance!

Given the present structure of financial intermediaries (at least in Europe), asset-backed finance is widely diffused in financial intermediation, as explains below. We first try to understand the relations between changes in the absolute level of debt allowances (ΔNFP) and risk exposure indicators. The regressions generate the results presented in Table 7.4.

The regression has an average R-squared value of 5% but clearly demonstrates that only the working capital indicator is significant. According to this analysis, no risk indicators seem relevant to credit allowances, while debt funding seems to be backed by operating working capital.

We then integrate the previous analysis with the Q ratios computed at corporate level to understand the relations between changes in the absolute level of debt allowances (ΔNFP) and risk-to-return ratio (at least for shorter horizons). The regression generated the results presented in Table 7.5.

The regression has an average R-squared value of 6.5%, which is higher than the previous regression. The working capital indicator is significant, and the negative relation between the Q ratio and debt allowances is confirmed. According to this analysis, debt funding is backed by operating working capital, even when negatively correlated with corporate returns. This result is particularly useful in explaining low

Table 7.4 Regression results for debt-to-risks relations (580-company's subset)

Dependent variable: D_PFN_M
Method: Least squares
Sample: 1 580
Included observations: 580

Variable	Coefficient	Std. Error	T-Statistic	Prob.
CCC_F_M	347303.5	65270.93	5.320952	0
D_E_M	5177.724	3499.732	1.479463	0.1396
GLO_M	–83.80405	137.0791	–0.611355	0.5412
GLP_M	4212.192	5107.091	0.824773	0.4098
C	9325.345	55685.87	0.167463	0.8671

R-squared	0.05212	Mean dependent var	153938.7
Adjusted R-squared	0.045526	S.D. dependent var	1004354
S.E. of regression	981225.2	Akaike info criterion	30.43957
Sum squared resid	5.54E + 14	Schwarz criterion	30.47719
Log likelihood	–8822.477	Hannan-Quinn criter.	30.45424
F-statistic	7.904204	Durbin-Watson stat	1.943972
Prob(F-statistic)	0.000003		

Table 7.5 Regression results for relations between debt and risks-to-return ratio (580-companies' subset)

Dependent variable: D_PFN_M
Method: Least squares
Sample: 1 580
Included observations: 580

Variable	Coefficient	Std. Error	T-Statistic	Prob.
CCC_F_M	335516.2	64769.42	5.180163	0
D_E_M	2816.236	3536.463	0.796343	0.4262
GLO_M	–113.9969	136.1205	–0.83747	0.4027
GLP_M	3597.49	5063.832	0.710428	0.4777
QS	–169001.4	49600.26	–3.407268	0.0007
C	157555.2	70266.18	2.242262	0.0253

R-squared	0.070911	Mean dependent var	153938.7
Adjusted R-squared	0.062818	S.D. dependent var	1004354
S.E. of regression	972296.1	Akaike info criterion	30.423
Sum squared resid	5.43E + 14	Schwarz criterion	30.46813
Log likelihood	–8816.67	Hannan-Quinn criter.	30.4406
F-statistic	8.761933	Durbin-Watson stat	1.947943
Prob(F-statistic)	0		

entrepreneurial funding: higher Q ratios indicate higher market values, which are usually unreported in financial statements, thus reducing debt allowances. Companies with high working capital and low profitability may have higher credit allowances because of their complete balance sheet reporting.

To determine whether credit allowances could be driven by long-term performance/competence and its persistence, we try to complete the initial regression using the T ratio data. The regression generated the results presented in Table 7.6.

The results are clear: no long-term performance measure is relevant in credit allowances, thus confirming that the relation with working capital actually depicts an asset-backed relation in bank funding for small businesses in the TV district.

The previous results indicate that debt allowances seem driven by asset-backed rather than valued-driven analysis. We repeat the analysis using the financial debt-to-equity ratio (NFP/E) as the independent variable; NFP/E was computed according to the book value to test the asset-backed

Table 7.6 Regression results between debt and risks-to-long-term-return ratio (580-companies' subset)

Dependent variable: D_PFN_M
Method: Least squares
Sample: 1 580
Included observations: 544

Variable	Coefficient	Std. Error	T-Statistic	Prob.
CCC_F_M	350568.6	65557.04	5.347537	0
D_E_M	5819.159	3684.465	1.579377	0.1148
GLO_M	–96.27933	135.7765	–0.709101	0.4786
GLP_M	8897.822	7285.777	1.221259	0.2225
TS	–6.59E–07	9.94E-07	–0.66302	0.5076
C	–22109.53	61561.19	–0.359147	0.7196

R-squared	0.057726	Mean dependent var	150179.7
Adjusted R-squared	0.048968	S.D. dependent var	992912.6
S.E. of regression	968296.8	Akaike info criterion	30.41543
Sum squared resid	5.04E + 14	Schwarz criterion	30.46285
Log likelihood	–8266.998	Hannan-Quinn criter.	30.43397
F-statistic	6.591791	Durbin-Watson stat	1.857249
Prob(F-statistic)	0.000006		

hypothesis. Table 7.7 displays the results of the regression analysis between risk indicators and the relative leverage ratio.

Interestingly, the R-squared of the regression decreases to an average level of 3.25%. The working capital impact is still relevant, but the t-statistic in the regression is now at 95%. The price risk is relevant, but the relation is quite unexpected: the higher the GLP index, the higher the financial debt-to-equity ratio. According to Eq.2, the relative weight of fixed costs over revenues can explain the relation: banks aims to fund companies with low fixed costs but do not consider that such a status increases the price vulnerability of the corporation.

The final regression includes both the Q and T ratios to better understand the book-value-to-leverage ratio of small businesses in the TV District. Table 7.8 displays the results.

This final model is more sensible due to its higher R-squared value; it depicts a capital structure for small businesses wherein the most important driver of debt allowances is the most liquid asset on the balance sheet (i.e., working capital). Only low fixed costs contribute to corporate capital structure, which misses the relative increase in price risk. Short-term return performance is not relevant for either equity funders or debt funders. (A negative relationship is found!) Long-term

Table 7.7 Regression results for leverage-to-risks relations (580-companies' subset)

Dependent variable: PFN_E_M
Method: Least squares
Sample: 1 580
Included observations: 580

Variable	Coefficient	Std. Error	T-Statistic	Prob.
CCC_F_M	0.444229	0.223637	1.98639	0.0475
GLO_M	0.000342	0.00047	0.727581	0.4672
GLP_M	0.069194	0.016922	4.088995	0
C	1.083497	0.18525	5.84884	0

R-squared	0.034946	Mean dependent var	1.632364
Adjusted R-squared	0.029919	S.D. dependent var	3.413534
S.E. of regression	3.36208	Akaike info criterion	5.26987
Sum squared resid	6510.864	Schwarz criterion	5.299959
Log likelihood	–1524.262	Hannan-Quinn criter.	5.281601
F-statistic	6.952559	Durbin-Watson stat	1.932259
Prob(F-statistic)	0.000133		

Table 7.8 Complete regression results for leverage-to-risks relations (580-companies' subset)

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	0.1175	0.024176	4.860227	0
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

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	7.08491	Durbin-Watson stat	1.969759
Prob(F-statistic)	0.000002		

performance is not relevant for book-value ratios, which are significant even for the coefficient of the regression for the T ratio; we suggest that this occurs because long-term return persistence it is important only for contributors to competence value.

3 Entrepreneurial Finance Differs from Corporate Finance

Funding entrepreneurial businesses is becoming increasingly difficult because financial markets cannot understand the nature of financial needs in the different stages of the overall entrepreneurial business cycle. A lack of assets to allow leverage along with a lack of information flows to allow growth monitoring is suggested to divert corporate funding from debt to equity capital. Accordingly, new regulations based on the Basel framework are changing dramatically the procedures for credit allowances used by financial intermediaries. Entrepreneurial firms and SMEs are most affected by this dramatic

reduction in credit as a consequence of their higher credit risk based on standard financial procedures.

Entrepreneurial firms are even more affected by the above crowding-out effect due to their higher concentration of investments in intangible assets and human capital. Their credit ratings are often lower because of their inability to obtain debt capital from the banking system since the intangibility of their investments is affected market incompleteness. A lack of asset in place reduces the debt capital needed to cultivate competences within the corporation, while equity capital is fully concentrated in intangible and competence efforts. However, both debt and equity capital are diverted from entrepreneurial finance transactions because their low return-to-risk profiles, mainly due to excess perceived risk and high investor risk aversion. The announcement of new Basel III standards is depicted as a "countdown" to the end of financial support for entrepreneurship. No one is able to definitively say whether these problems stem mainly from methodology (the adoption of specific techniques of financial analysis) or from assessment (the concepts of entrepreneurial business valuation and management).

This book suggests a common root for both sides of the puzzle: the lack of competence value measurement. Thus, it also suggests a possible solution. To achieve this, you must accept divergence from standard, neoclassical financial theory and adopt a new approach based on point-to-point negotiation. The specific risk aversion profile must match the risks of the investment. This is why entrepreneurial finance differs strongly from corporate finance; in entrepreneurial finance, endogenous risks matter more than exogenous risks.

The T ratio is proposed as a possible measurement tool for competence value, which seems compatible with the modern standards of financial regulations and very effective, at least for a large sample of companies from the TV district. Comparing the T ratio with the widely known (i.e., used in banking practice) Q ratio, possible inefficiencies in capital allocation arise. In fact, the widely used Q ratio estimates cannot explain the above-average performance of several small business districts (e.g., the Venetian Northeastern Area) or their long-term persistence. The methodology proposed to compute the T ratio is fully compliant with modern banking regulations (such as the Basel agreements) and with the need to use structured debt to finance entrepreneurial needs. This could lead to superior rating systems for entrepreneurial businesses, which could contribute to higher growth in the future.

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