Community Italian Leaders Abroad

INNOVATION AS DRIVER TO IMPROVE ITALIAN COMPETITIVENESS

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Innovation as driver to improve Italian competitiveness

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EXECUTIVE SUMMARY

The working group responsible for preparing this document, convened with the support of Aspen Institute Italia, brought together expertise in the field of economics as well as in research and innovation management with a view to formulating proposals aimed at promoting the innovation process as a stimulus for Italian growth and competitiveness.

The analysis conducted of the situation in Italy highlighted the following critical issues:

- Investment in innovation – not just in physical capital, but also in intangible assets, such as human and intellectual capital – is crucial to putting Italy back on the road to strong and lasting growth. This calls for a systemic approach which hinges on the involvement of the various relevant actors and enables the unproductive debate over brain drain versus brain gain to be relinquished in favor of efforts aimed at stepping up “brain circulation” processes.

- The funds available for such investment are insufficient: according to OECD estimates, Italian firms invest much less in innovation – particularly in Research & Development (or R&D) – than those of other advanced nations; at the same time, the parlous state of the public finances makes it unrealistic to contemplate a significant increase in the public sector’s contribution, at least in the short term.

- Industrial districts, despite having been a resounding success in Italy in the 1970s and 1980s, have in part lost their innovative capacity, especially in hi-tech sectors. Moreover, the modest size of the vast majority of Italian firms makes both investment in R&D as well as engaging in the international partnerships now so crucial to the innovation process more difficult.

- The financing of innovation and innovative start-ups is a pivotal factor. The traditional venture capital (VC) model is a difficult one to transpose to an Italian setting, owing to limitations that stem from that model’s particular context of origin, which is characterized by strong growth markets, speculative investors not overly averse to risk, and a propensity towards frequent turnover in the ownership and control of firms. This does not tally with the Italian scenario, which is, in contrast, typified by a vast array of small family-owned businesses.

- There are indisputable pockets of dynamism in Italy, albeit not yet organized into a virtuous ecosystem, including: universities such as the University of Trento, which invest both in research and its economic application; and mechanisms and institutions like the APRE Tuscany regional help desk, the Fulbright BEST program, and the Italian Business and Investment Initiative, along with many other examples. These scattered elements are currently not linked up adequately and lack a structured management, but could form the basis for the formation of a proper ecosystem.

We therefore make the following concrete proposals for action:

- The creation of a new technology funding vehicle, with the participation of local and national administrations as well as the private sector. The set goal of this fund would be to create medium-term value for the firms that it finances through the growth of an original portfolio and the distribution of dividends (a model which seems much more suited to Italy, with its network of small family-run businesses), and not through buy-outs as in the classic VC model. Similar such structures exist, for instance, in the UK, such as Imperial Innovations or 3i, and in France, with companies like Truffle Capital.

- Focusing the operations of the fund on two or three innovative sectors in which Italy has serious prospects of excelling (like renewable energy and telemedicine), and choosing a few
regions (no more than four) in which to try out forms of strategic interaction between firms, universities, research centers, the Italian National Research Council and investment companies.

- Tapping into the rich network of experts (Italian and non-Italian, in Italy and elsewhere) on the various (technical, financial, planning, marketing, human resources, strategic and relational) aspects of innovation management in order to recruit entrepreneurs and operational experts to the fund, thereby providing a pool of expertise that can be used across the entire portfolio and for individual firms that are financed, so as to train and strengthen management teams and help them to create long-term value, as well as supplanting the more strictly financial models that have characterized the VC model in the past. From the outset, the team of experts will work closely with the Italian Ministry of Education, University and Research; and indeed, it will be this very institution that will contribute to putting together the team itself.

- Entrusting to the team of experts the responsibility of selecting the technologies, start-ups and small firms to focus on, and of building partnerships (with R&D bodies, business schools and large or medium-sized enterprises interested in exploiting the innovation generated by the firms funded), in order to cultivate the formation of a fully-fledged ecosystem around a cluster.

We believe that – if well managed – the fund could achieve a very high level of market capitalization. The ultimate goal in the medium term would be (within ten years) to arrive at a publicly-listed company of a scale that would enable it to act as a game-changer in supporting growth through innovation and as an engine for a revitalized district model.
1 COMPETITIVENESS AND INNOVATION

1.1 How does innovation foster competitiveness?

The crucial role of technological innovation in improving productivity, economic growth and standard of living has been widely recognized by economists and policymakers. Michael E. Porter wrote in 1999:

“No advanced economy can maintain high wages and living standards, and hold its own in global markets, by producing standard products using standard methods. In a rapidly integrating world economy where lower wage developing countries are quickly improving their skills and can access today’s technology, U.S. prosperity depends on whether we can remain a moving target. We must continually improve our ability to identify and commercialize new products, services, and processes. Those must be high-value (even unique) to yield the productivity growth needed to generate profits and support high-wage jobs”.

The role of innovation has become even more important in the aftermath of the 2008-09 Great Recession that has led to lower potential output growth, high levels of unemployment and a soaring public debt in many advanced countries. Promoting innovation at the time of limited public finances and great uncertainty as to the short-term prospect of the global economy is arduous and requires a comprehensive strategy tailor at the level of each country that builds on each country’s strength and innovation potential.

The challenges of promoting structural reforms in Italy to boost innovation and productivity are compounded at present by an uncertain global economic environment, a stronger competitive pressure from key emerging economies and rapidly evolving technologies and production processes. The percentage of companies falling out of the top three rankings in their industry increased from 2% in 1960 to 14% in 2008.

In The Upside of Turbulence: Seizing Opportunity in an Uncertain World, strategist Donald Sull argues that “Unexpected changes are not bugs in the world’s operating system; they are a feature”. In addition to economic slowdown, the wealthier world’s economies are largely changing from being manufacturing-based to services-based. This means that many people who earned a good living working in a factory in developed countries may find it impossible to ever find another manufacturing job again. As a consequence also the customer value is evolved. Companies that have been innovating ever-increasing complexity into their products to increase margins and income must now innovate to reduce complexity, provide additional value and reduce costs.

The rich world still retains an advantage in cutting-edge technology, quality-of-life sciences and the like. In addition, healthier economies have historically had more money to pour into research and development; this has given them a strong advantage in scientific and technical innovation. Clearly, businesses in both the developed world and emerging economies need to learn from each other.

Italy has accumulated over the past decade a significant gap in innovation and growth compared with most of its partners. Even before the 2008-09 global economic crisis, Italy had a significant

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gap in GDP per capita with respect to the most affluent OECD countries – around 35% vis à vis the US (Figure 1). Moreover, in the decade to the crisis, the gap in living standards increased further, as Italy experienced a protracted period of very low economic growth (Figure 2).

As shown in Figure 1, much of the gap in GDP per capita in Italy, compared with the US and other affluent OECD countries, can be explained by the large gap in labour productivity. This productivity gap has a long history, but further increased over the past decade when the limited output growth in Italy was largely driven by greater labour utilization rather than productivity catch up.

In these circumstances, while the search for new sources of growth is a common challenge in all advanced countries, it assumes an even more pressing character in Italy.

\[^{3}\] For example, the percentage of firms that have failed to retain a top 3 ranking in their particular industry rose from 2% in 1960 to 14% in 2008.
Going forward, promoting innovation for competitiveness becomes essential to counteract population ageing with the associated decline in the working age population and diminishing returns from labour inputs and investment in physical capital. Future growth must increasingly come from innovation-induced productivity growth. Innovation – the introduction of a new or significantly improved product, process or methods – holds the key to boosting productivity and living standards.

**Figure 2**

*What drives cross-country differences in GDP per capita growth?*

Total economy, percentage change at annual rate, 1997-2007

Public policy can and should play a key role for promoting innovation and competitiveness. It should, however, take into account the significant changes in the global economy and the transformation of innovation processes. Translating an invention into a successful innovation requires a wide range of complementary actions at the level of the firm and the sector, including organisational changes and training of the workforce at the firm level, marketing and design and specific business services. Indeed, innovation today encompasses much more than research and development (R&D); it rarely occurs in isolation but rather is a highly interactive process of collaboration across a growing and diverse network of stakeholders, institutions and users. Moreover, the emergence of new and important players in the global economy has added to the complexity of the multifaceted international landscape of innovation.

1.2 How does Italy compare on innovation and productivity performance?

*Low productivity growth and limited investment in intangible assets*

Figure 3 presents a decomposition of average labour productivity growth in Italy and a group of OECD countries in the decade to 2006. Italy experienced over the decade a very modest average labour productivity growth (around 0.8%). This meagre productivity growth was entirely driven...
by investment in physical capital and some improvements in labour quality (higher human capital of the workforce), with a negligible role of investment in intangible assets and actually a negative contribution of MFP – a standard proxy for technological progress that accounts for the efficiency in the utilization of factor inputs in the production process. Estimates suggest that investment in intangible assets and MFP growth accounted for between two-thirds and three-quarters of labour productivity growth in OECD countries such as Austria, Finland, Sweden, the United Kingdom and the United States between 1995 and 2006.

**Figure 3**  
Factors driving labour productivity growth, 1995-2006 (in %)


Going one step further and decomposing overall investment in fixed and intangible assets in 2006, reveals that some advanced countries have almost half of their investment in intangible assets – e.g. Sweden, Finland, US and UK) while Italy has the bulk of investment in machinery, equipment and buildings and only a small fraction on R&D and other intellectual property products as well as other forms of intangible assets (Figure 4).

**Figure 4**  
Investment in fixed and intangible assets as a share of GDP, 2006

Low investment in R&D, with limited public support

Why investment in intangibles has lagged behind in Italy compared with most of its trading partners? Research and development (R&D) activities are an important element of the overall investment in intangibles. In 2008, Italy’s gross expenditure on R&D (so called GERD) accounted for 1.2% of GDP, against an OECD average of 2.3%. At the same time, business expenditure on R&D (BERD) stood at 0.6% of GDP (about 50% of total GERD, against an OECD average of 64%) and venture capital intensity at 0.04% of GDP, both at the lower end of the spectrum among advanced economies.

Public policies play a key role in promoting and supporting innovative efforts by firms. Tax policies affect the decisions of firms to save and invest and have a clear bearing on innovative activity. In particular, R&D tax credits can be a relatively attractive incentive mechanism for innovation and are used extensively in a number of OECD countries (Figure 5). In Italy, however, the overall limited support to business-sector R&D takes entirely the form of direct support, with no tax relief in support of R&D (see below for a more detailed discussion on how to finance innovation).

![Figure 5](image)

Direct and indirect government funding of business R&D and tax incentives for R&D, 2007
As percentage of GDP


1.3 Beyond R&D: exploiting the power of intangible assets

While R&D remains vitally important, innovation is driven by a number of interacting factors. Most importantly, with the increasing complexity and associated costs of innovation, especially for firms that are close or at the technological frontier, collaboration has become a key factor of success. Interestingly, collaboration is not only a way to save on costs but also, if not predominantly, a way to extend the scope of an innovative project and exploit complementarities with other firms. Indeed, OECD analysis shows that firms that collaborate on innovation spend more on innovation than those that do not.
The scope of domestic and international collaboration is large and growing; in a number of OECD countries -- including the Nordic European countries, as well as the UK, Belgium and the Netherlands -- one-third or more of total innovative firms engage in national, and increasingly international, collaboration (Figure 7). As stressed in the OECD Innovation Strategy (2010), firms acquire external knowledge through different forms of partnerships, alliances and joint ventures with external parties or through the acquisition of knowledge, e.g. through contract R&D and licensing of patents. They also increasingly seek external partners, partly through emerging knowledge markets, to commercialise innovations that are not used internally. As shown in Figure 7, however, innovative Italian firms are only marginally involved in collaboration with other firms: about 10% of them collaborate on innovation with other Italian firms, and only an additional three per cent is involved in international collaboration. While this may reflect the specific characteristics of Italian firms, with the pre-dominance of small and medium-sized firms that undertake informal rather than formal innovation, this fact points to the need to promote greater links between firms to reach the critical mass often required to engage in successful innovation.

![Figure 6](image)

**Figure 6**

**Firms with national/international collaboration on innovation, 2004-06**

As a percentage of innovative firms


**Innovation via creative destruction**

Innovation and the adoption of new leading technologies are undertaken by existing firms but also promoted by the entry of new innovative firms and the exit of older and obsolete ones. The process of so called “creative destruction” is sizeable in all market economies and plays a key role in fostering innovation and competitiveness. For example, the entry and exit rates (as a share of the total population of firms) range from 5-6 per cent in Germany and Italy, to 7-8 per cent in the US, France and the UK. Most new entrants are much smaller than the incumbents they are challenging in the market (20 per cent of the average size of the incumbent in the US, about 40 per cent in Italy) and many do not survive the first years of live (see Bartelsman, Haltiwaner and Scarpetta, NBER, 2009 for a review). At the same time, many exiting firms are older, less productive firms that can no longer face competitive pressure in the market. Both market entry and exit are indispensable for

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the experimentation that leads to the development of new technologies, processes, business methods and markets.

In this context, Italy is characterized by a large share of small and micro firms – more than 90 per cent of all registered firms have less than 20 employees, against an average in a number of OECD countries around 80-85 per cent. Firm turnover rates are relatively low, despite the small size of firms that could have led to higher turnover (small firms tend to churn more than larger ones). Simplifying and reducing start-up regulations and administrative burdens can reduce barriers to entry. Since firms planning to enter the market may have little idea of their chances of survival, costly exit can discourage them from entering. Moreover, many of the new entrant firms in Italy that survive the market test do not expand to reach an optimal efficiency scale. This suggests there are also significant barriers to expansion of successful new firms. This has to do with a number of factors ranging from access to credit, to infrastructure to market opportunities.

The lack of dynamism of new firms is also reflected in their ability to contribute innovation. Information on innovation by new firms is difficult to collect, but available indicators suggest that 15-20 per cent of new firms (less than 5 years of age) are involved in patenting activity and they account for about 10 per cent of total patents in Finland, Sweden and the UK and for 15 in the US and Denmark; in Italy only about 5 per cent of new firms are engaged in patenting (Figure 8).

Figure 7
Patenting activity of young ( <5 years) firms, 2005-07
Share of young patenting firms and share of PCT patent filings by young firms (%)


Strengthening the links between scientific research and innovation

Not all is doom and gloom in the innovation front in Italy. Italy excels in a number of markets showing great vitality in process and especially product innovation. Innovative activities in Italy could also potentially tap in a rich human capital and scientific research. Indeed, Italy is relatively

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well placed in a number of innovation-related indicators (Figure 8), including new doctoral graduates, international scientific publications and, most importantly, in the share of employment in knowledge intensive activities and the contribution of high and medium-high tech manufacturing products in the EU trade balance (see EU R&D profile of Italy, 2009). These factors of strength could be further exploited by creating better links between the scientific research community – universities, polytechnics, research labs – and innovative (or potentially innovative) firms. While much of the action should be with the stakeholders directly involved, public policy can play a major role in facilitating these partnerships and promoting collaborations (see below).

Figure 8

1.4 Innovation for Italian competitiveness: build on the strengths and tackle key bottlenecks

This section has highlighted a number of issues in Italy’s innovation process. We have highlighted the need for public policies such as R&D tax incentives; the need for more collaborations amongst Italian and also foreign firms to exploit complementarities, save costs, foster competitively and
scale the business; and finally the need for more investment in intangible assets such as human and knowledge capital (through patents). Some of the under-lying issues are structural in nature and to a significant extent related to the Italian economic structure, firms’ characteristics and market conditions. Tackling them would require significant resources and time. But there is much that policy and private equity can do to stimulate innovative activities, facilitate collaborations and promote innovation by start-ups and other young innovative ventures. Moreover, innovation in Italy could draw from underutilized human capital and excellence of the scientific research in a number of fields.

In fact, isolated examples of success exist. For example, the University of Trento is reputed for its research and is viewed as having been the driver for establishing a local area of excellence in the knowledge economy. There are also institutions such as CEFRIEL that are being successful in strengthening ties between academic and business worlds in the ICT sector. Finally, institutions like the Scuola Sant’Anna have promoted the creation of spin-offs and is fostering their interactions through the Club degli spin-off della Scuola Superiore Sant’Anna. These are only a few of the different examples of islands of innovation excellence in Italy. But without promoting a more widespread innovation culture and conducive environment, these islands will not be able by themselves to make a significant difference in raising Italy’s competitiveness.

In this context, many national and international institutions have come out with detailed lists of recommendations to promote innovation and competitiveness in Italy. In particular, two recent and influential reports have highlighted the following key challenges:

The InnoPolicy TrendChart report concludes that priorities to foster innovation in Italy include:

- More selective and finalized incentives, leading to larger investments with critical mass fostering better performance and more management efficiency;
- Continuity and stability of policy plans that bring durable effects on the innovation system;
- Public-private partnerships, cooperation among companies and promotion of network-based schemes; cooperation between Northern and Southern regions;
- Sustaining cluster leveraging policies to strengthen national ‘areas of technology excellence’ (technology districts, innovation poles, cooperation and synergies between public and private systems);
- Accelerating innovation in the public sector as a ‘driving force’ for the whole country’s innovation system, an example is the current effort on e-government.

According to the OECD, in its Country Profile Science and Innovation, measures that could boost Italy’s innovation performance include:

- The development of human capital and business innovation;
- Better exchange and co-operation between public and private sector research;
- Better co-operation among regions;
- Accelerating innovation in the public sector as a driving force for innovation and a catalyst to increase investment in R&D.

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1 http://www.linkiesta.it/se-l-italia-innova-come-trento-ce-fa?page=full
2 www.cefriel.it
3 http://www.sssup.it/context.jsp?ID_LINK=294&area=47
4 Inno-Policy Trend Chart, Innovation Policy Trend Report, Italy 2009
5 http://www.politicheinnovazione.eu/

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In this paper we have therefore chosen to focus on three key aspects that together address many of the fundamental issues and recommendations listed above.

The first aspect is related to **the development of the intangible assets** and in particular the human capital. Proper organizational and management skills are often seen as weak points in the Italian social fabric while they are success factors to unlock innovation potential and convert it in competitive advantage.

The second aspect is related to **the development of innovation clusters**. Italy has been a pioneer in developing industrial districts since 1970/80s. We analyze why they have not been so successful lately and argue how to capitalize on the experience of the past to create a new dynamism and a more coordinated effort with start-ups, industry, government and research.

The third aspect tackles the critical point of adequate **funding of innovation**. We analyze current trends in past funding models, such as Venture Capital money, and argue for a new type of funding model that relies on a strong and coordinated innovative ecosystem and can operate within the Italian social fabric.

## 2 LAYING THE FOUNDATIONS OF INNOVATION DEVELOPING THE INTANGIBLES

### 2.1 Needing more than R&D labs

No doubt that R&D labs and researchers are essentials for innovation. However more is required to lay robust foundations for successful innovation. To convert ideas into successful business, a lot of work must be done in managing resources, design organizations and master company financials. Strict management is required in order not to lose innovation potential. In Italy, where start-ups and SMEs play such an important role in innovation, this principle is too often neglected and companies are led more often by idea owners (generally researchers) than by professional managers.

However for companies to be truly competitive, innovation has to be part of the fabric of the entire company and be the driver of all activities. This is often difficult to realize since innovation leads to changes that employees often resist.

In order for innovation to be pervasive and be part of a company’s culture, one has to overcome repetitive patterns and people’s reaction to change, which means understanding better people’s behaviours. This is why neuroscience is playing a great role in enhancing companies’ innovation and competitiveness, since Daniel Goleman brought it into the business arena in mid 90’s.

### 2.2 Facilitating organizations to unlock innovation

Innovation means to find solution beyond patterns. The most powerful resource to identify and overcome patterns comes from neurosciences. Since the neurological patterns form based on experience, corporate culture tends to be self-reinforcing – people come to see a particular way of doing business as normal, and normal feels right. But business-normal is often dysfunctional.

The example of W.L. Gore company – the makers of the waterproof fabric GORE-TEX widely used in outdoor gear, founded in 1958 by Bill and Vieve Gore, offers interesting insights. Bill realized when he was working in Dupont that there were only two places where people really collaborated: an informal taskforce and a carpool. All the others situations were affected by hierarchy and roles!
He tried to create a new company with a new culture: no hierarchy but only teamwork. When a new Associate (not “employee”) comes into the company, they’re told, “We have no bosses here.” At first the new people think that that’s just corporate talk and euphemism, and for a period they keep asking, “no, really – who’s my boss?”

Eventually they begin to “unlearn” the old patterns and adapt to the Gore culture. Now almost 50 years old with over $1.8b in sales, 45 plants, and nine years near the top of Fortune’s 100 Best Places to Work, the experiment seems to be a success. In terms of change, what’s interesting about the Gore case is an illustration of the power of patterns. The conceptual framework starts at a neurological level with brain cells connecting to form interlocking systems. Those new Gore employees have the system of “boss” and “hierarchy” strongly connected with the notion of “work.”

The patterns become a kind of frame though which they see the world, and their brains literally restructure so that frame makes sense.

Experiences like the Gore’s one are always more common in US and the same concept starts to be followed successfully also in Italy (see the case study reported in the box).

This type of learning, reconnecting neural systems, is what neuroscientists call “plasticity” – they brain is changeable, and first-hand experience over a period of time is a powerful way to rewire the synapses. Neural connections develop and change in response to environmental stimulation. The first step to changing patterns is recognizing them, a conscious appraisal of thoughts, feelings, and reactions. This requires self-reflection – or “zooming back” to see a larger picture.

To facilitate and unlock innovation, beyond monetary investments, organizations can embrace the science of learning, the neurobiological foundations of change as a way to overcome and change patterns, into a culture and climate-based model able to predict extraordinary results.

Innovation is more determined by the specific organizational culture and climate rather than investments. This is also the conclusion of the recent Booz & Companies survey with innovation executives and results are reported in Figure 10. Seven of the top 10 innovators, in fact, were not among the top 10 spenders on innovation. In addition the top 10 innovators turned in better financial performances than the top 10 spenders.

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One example in Italy of the “people centred” approach is given by CIBA Specialty Chemical, now part of BASF. The company was engaged in a major change initiative to foster profitability in the extremely challenging environment of 2006-2008. Thanks to the people centred innovation methodology used in the main Italian site, it was possible to achieve important business goals — for example, over two years, productivity increased by 18% while simultaneously reducing customers’ complaints by 73%. At the site near Bologna, Italy, which produces a variety highly specialized products in a highly competitive global market, the senior plant leadership decided to fuse the implementation of structural changes (as SAP introduction, Lean Manufacturing transformation, business re-engineering) with an Emotional Intelligence (EQ) initiative. The EQ activities were designed to support the managers to understand the reaction of personnel during such impacting changes, to engage the middle managers gaining their commitment and to enlarge the base of the “change agents.”

Senior and middle managers participated in strategic workshops resulting in all managers recognizing and appropriately expressing their feelings, building a common vision and eventually becoming committed as change agents. Their assignment as change agents provided a focus to mentor employees to “buy in” to the company. An assessment was initiated to focus on the company’s strengths and weaknesses — specifically in terms of “people side” areas contributing to trust, change, motivation, teamwork and execution. Training sessions were delivered with a focus on individual employee’s response to change and this safe environment provided a venue to share individual and collective feelings about becoming change agents. Outdoor training activities for middle management were implemented; subsequently also shop floor employees had the possibility to participate. The company’s commitment to change was monitored with periodic adjustments, fine-tuned when necessary. With the consistent utilization of emotional intelligence encouraging staff towards more intentional communication, change continues to boost site performance.

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Consequently the question that must be addressed is on what kind of workplace environment is needed to allow people to perform optimally and foster innovation.

Latest research says that innovation is generated by an organizational culture and climate based on 5 dimensions: Motivation, Teamwork, Change, Execution and Trust. These five “people centered” factors explain 50.4% of companies performance and innovation.

2.3 Addressing innovation beyond continuous improvement

Faced with complex, open-ended, ever-changing challenges, organizations start to realize that continuous improvement is not enough. An emerging key success factor to stay ahead of the competition, is the ability to find new breakthrough solutions. As A. Einstein said: “We can’t solve problems by using the same kind of thinking we used when we created them.”

This is particularly true when, as in several cases in Italy, the innovator is not in a technology or market leading position. In these cases a quantum leap is required to regain the leadership. If we do not recognize it and do not dedicate to this the proper level of attention and funds, it could be very hard for Italy to recover the lost positions in innovation and competitiveness.

Continuous improvement is like current thinking; it produces current actions and current results. Breakthrough innovation is based on extraordinary thinking (overcoming patterns) to produce extraordinary actions and results.

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**Figure 9**
The 10 Most Innovative Companies

<table>
<thead>
<tr>
<th>Company</th>
<th>R&amp;D Spending</th>
<th>Rank</th>
<th>as % of Sales Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>$1,782</td>
<td>70</td>
<td>2.7%</td>
</tr>
<tr>
<td>Google</td>
<td>$3,742</td>
<td>34</td>
<td>12.8%</td>
</tr>
<tr>
<td>3M</td>
<td>$1,676</td>
<td>86</td>
<td>5.4%</td>
</tr>
<tr>
<td>GE</td>
<td>$3,955</td>
<td>32</td>
<td>2.6%</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$8,714</td>
<td>4</td>
<td>14.0%</td>
</tr>
<tr>
<td>IBM</td>
<td>$4,026</td>
<td>15</td>
<td>6.8%</td>
</tr>
<tr>
<td>Samsung</td>
<td>$7,873</td>
<td>7</td>
<td>5.9%</td>
</tr>
<tr>
<td>P&amp;G</td>
<td>$1,950</td>
<td>61</td>
<td>2.5%</td>
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<tr>
<td>Toyota</td>
<td>$8,566</td>
<td>6</td>
<td>3.9%</td>
</tr>
<tr>
<td>Facebook</td>
<td>Not reported</td>
<td>N/A</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

Source: Bloomberg data, Boc & Company

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The files reported in Figure 10 represent companies’ current thinking: companies’ current boundaries towards breakthrough thinking. They represent companies’ “comfort zone” and ultimately companies’ limiting assumptions.

Italian companies should be stimulated and supported to dedicate more efforts into this strategic direction. Companies in mature industries can find ways to avoid to be strangled by emerging countries low cost producers who first push them into the higher margin but (much) lower volumes niches and who finally, once their quality level is increased, kick off Italian companies out of the market or purchase their brands or factories.

One of the most powerful strategy to compete with low cost producers has been developed by Clayton Christensen, Professor at Harvard Business School and opinion leader for his studies of innovation in commercial enterprises.

Christensen’s Strategy
According to Christensen\(^3\), companies that become attached to "Sustaining Innovation" eventually disappear or lose their market leadership position. "Sustaining Innovation" is innovation derived from evolving the current product, serving profitable customers' needs, and focusing on investments driven by profit margins. On the other hand, companies that drive "Disruptive Innovation" create new markets with opportunistic and creative Innovation, take away market shares from existing players of "Sustaining Innovation", and eventually become market share leaders. "Disruptive Innovation" is derived from creating simple, easy to use products that appeal to the low-end of the market, or a new, untapped market. Frequently "Sustaining Innovation" companies are driven up-market in a response to the low-end "Disrupting Innovation" players thus relegating them to a smaller segment of the market.

How easy is it to cause Disruptive Innovation? According to Christensen, Disruptive Innovation necessitates a disparate strategy process - not on what is already known to work, and incremental improvements. The process is driven by creativity, unconventional and out-of-the-box thought,

\(^3\) C. Christensen (1997), "Innovator's Dilemma: When New Technologies Cause Great Firms to Fall", Harvard Business School Press, USA
and without any anticipation. Further, the process design does not begin with addressing the needs of current customers; rather the process design targets what's underneath the need, what drives customers to do what they do, where the unanticipated need is. And finally, Disruptive Innovators are not profit driven - at least not initially. Their focus is on creating something of intrinsic value that will appeal to a much larger market, yet is intuitive, easy to use and simple.

2.4 Proposed Actions

The need to develop the intangible assets has been recognized as the first key aspect to unlock innovation potential. Having provided evidences on how this factor is linked to companies’ success on innovation and ultimately in competitiveness, we argue that Italy should invest more in the teaching and practicing of innovation management and that Italian business schools should offer comprehensive courses on the subject beyond what is offered today. A team of experts could provide guidance on how to invest in these areas that Italy has neglected in the past, primarily human capital and intellectual property development.

In addition Italian companies should be able to draw from experts consulting in this area, who are available also in the Italian territory.

The efficacy of this development will be definitely higher if we would concentrate the efforts in specific districts. As we are going to argue in the next chapter, the development of innovation clusters is the second key aspect highlighted by this paper.

3 FOSTERING HI-TECH INNOVATION WITH INNOVATION CLUSTERS

3.1 Building on the Italian excellence of industrial districts

Alfred Marshall, founder of the Cambridge School of Economics and one of the fathers of modern economics, can be credited for setting the foundations of industrial districts, even though he did not use this nomenclature in his work. Marshall proved in his early writings that most of the advantages of large scale production can also be achieved by a population of small and medium-sized enterprises (SMEs) that are concentrated in a geographical area specialized in different phases of production and that find their labor supply in a single local market. He argued that the market (such as the provision of specific goods and services by specialized suppliers and the creation of a local labour market pool sustained by a local concentration of production) may transmit ‘pecuniary’ externalities.

Italy’s corporate ecology is populated by SMEs. In the 1970/80s, international interest in Italian industrial districts was fuelled by the success of what came to be known as the Third Italy. In this period, the Northeast and Centre of Italy recorded fast growth thanks to the international competitiveness of groups of firms clustered together in specific regions and operating in sectors such as textile (Carpi, Prato), leather and footwear (Arzignano), ceramic tiles (Sassuolo) and furniture (Manzano). In addition to an acute sense of private entrepreneurship, another feature of the industrial districts has been focused public support to supply business development services that are highly customised to the specific industrial tradition of each area (also known as real services in the literature).

14 According to Istat, in 2001 there were 156 Sistemi locali del lavoro that could be classified as “industrial districts”. In 2007 such territories accounted for 22.5% of population, 39.0% of manufacturing employment and 37.2 of exports. Districts are much more important in Centro-Nord (43% of total manufacturing employment) than in Mezzogiorno (10%).
The districts produced knowledge spillovers that increased the stock of knowledge available for each individual firm. Such knowledge externalities may positively affect the ability of district firms to innovate. By “working on similar things and hence benefiting much from each other’s research”, knowledge created by one firm may spill over to other firms. In other and more colourful words, knowledge is simply “in the air” and can easily be absorbed in an “industrial atmosphere”. In the 1990s Italian manufacturing firms belonging to industrial districts began to carry out an intentional innovative effort, in addition to ‘Marshallian’ externalities.16

All this made it possible to increase productivity and attain large export shares in international markets, especially in traditional sectors where Italian firms compete with low-labour-cost countries that tend to specialize in mature products.17 Nonetheless, some see the year 2000 as the beginning of the decline of this so-called Third Italy due to the difficulty of effectively internationalise this model, the inability of SMEs to formalize their innovation efforts, invest in R&D and protect themselves through patenting.18 Individual firms have limited technical or science-based capacity to produce breakthrough products, while technical personnel in regional industries have lower level degrees by comparison with other comparable European regions. In addition, small firm size slows down the adoption of ICT equipment and its use to modernize corporate practices. On the other hand, even in mature sectors such as footwear, important experiments are underway to increase the innovative content of the products, partly also by formalizing the R&D efforts.19 As the Bank of Italy recently noticed in a comparison of the diverging fortunes of the clothing-textiles districts, successful cases such as Carpi are associated with “riposizionamento di un gruppo di imprese su fasce di mercato a maggior valore aggiunto attraverso importanti investimenti nel marchio, nella ricerca sul prodotto e nelle reti distributive”.20

3.2 Learning from successful hi-tech innovation clusters around the world

At the root of the Marshallian approach stands the intuition that the districts represent the virtuous collocation of an ecology of small firms with a population that possesses the social and cultural features (social values and institutions) appropriate for a bottom-up industrialization process. This sort of congruence between the requirements of a specific kind of organization of the production process, and the social and cultural characteristics of some group of people can be found in many other places.

Silicon Valley is the best-known example of a cluster, with some important corporate headquarters (Lockheed, Hewlett Packard) and big universities (Stanford), all heavily dependent on military spending, providing the hotbed for electronics start-ups.21 The Cambridge biotechnology cluster in the UK benefitted from the presence of the genomics campus of the Wellcome Trust, the world’s largest medical research charity, at Hinxton Hall. Other countries have modelled their Science

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17 While Italy ranks 48th in the World Economic Forum’s Global Competitiveness Report, the country is better placed (20th) for business sophistication, i.e. the ability to produce high value products using the latest production processes.
18 http://www.economist.com/node/18560669
19 «L’azienda marchigiana Eurosuoile Spa, anche nel corso del 2009, ha sviluppato diversi progetti di ricerca tesi alla realizzazione di prodotti innovativi ad alto contenuto tecnologico ed ecocompatibili (“lo sviluppo dei progetti sono demandati all’apposito gruppo costituito all’interno dell’azienda e denominato L.I.T. Laboratorio Innovazione Tecnologica...lo stesso viene integrato con tecnici e personale interno specializzato e viene supportato da collaborazioni, appositamente attivate, con Università e centri di ricerca”, Relazione al bilancio 2009)» (cited in *La Riviera del Brenta nel confronto con i principali distretti calcaturieri italiani*, Intesa Sampaolo – Servizio Studi e Ricerche, 2010)
20 *Economie regionali*, n. 23, November 2011, p. 17
21 By way of contrast, Route 128 in the Boston region has been dominated by large, vertically-integrated high technology firms which are reliant on proprietary technologies and autarkic firm structures. See Saxenian, Anne-Lee (1994), *Regional Networks: Industrial Adaptation in Silicon Valley and Route 128*, Cambridge: Harvard University Press
&Technology parks on these foreign successful experiences. Two particularly well-known examples are Hsinchu in Taiwan and Zhongguancun in China: they both put in place ad hoc policies to link the scientific and financial diasporas with the local business community.

The challenge for Italy and for Italian regions is to design and implement policies and strategies for innovation that explicitly incorporate the idea of innovation as a systemic process, embedded in specific socio-cultural and institutional contexts and developing along clustered sets of production and research activities. Recent research points to factors that facilitate the emergence of innovative districts: the historical presence of large manufacturing firms, a long-term trajectory of (material and intangible) external economies, entrepreneurship and excellence in university and public research.22

A recent report by Daniele Schiliro’ argues that perhaps Italy is slowly entering the “fourth capitalism”23 period. There is, for example, the strengthening of medium size companies (with 50 to 250 employees) that have been able to preserve the heritage of Italian districts: they have strong value chain interactions, deep vertical knowledge and flexibility to adapt to new customer needs. At the same time they are adopting new organizational models, such as the outsourcing and/or dislocation of less knowledge-intensive production elements and the international marketing of their goods and services.

There are four thousands of such medium size companies in Italy13. Each of them interacts on average with a supply chain of around two hundreds small companies. Many observers see in them the new engine of the Italian economy.24 Moreover, what is relevant in the context of this paper is that these medium enterprises are starting to understand the role of innovation and how to use it to compete in the global market. Professor Varaldo argues that a new entrepreneurial spirit in Italy and this potential fourth capitalism could be pivotal to foster competition in Italy.25

These positive signs are one more reason why Italy has to act now to foster innovation and capitalise on these new positive trends. In addition, in the aftermath of the crisis new “frugal innovation” models are emerging from which Italy, with its long tradition of inventiveness in hard times, can benefit.26

There are numerous questions that need to be addressed quickly, such as:

- How can efficient networks be created to increase R&D, patenting and innovation transfer to support mature SME systems in their transition to the knowledge economy?
- Which methods and funds are appropriate to increase cooperation between SMEs and R&D institutes and develop industrial business networks and clusters?
- How can one increase the number of innovative business ideas and products that emanate from Universities and public-funded R&D labs?
- What is the role of foresight and territorial analysis; which tools can improve territorial management and planning development?

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23 Daniele Schilirò, Innovation and Performance of Italian Multinational Enterprises of the “Fourth Capitalism”, Rapporto Mediobanca-Unioncamere, November 2011
The questions are very diverse, but the underlying issue is how to create an efficient ecosystem between companies, universities, public and private research that is properly funded to be able to make a difference. The funding issue is particularly challenging, given the current financial and economic climate.

The Italian government can intervene and promote business angel investment by offering a tax relief to private individuals in exchange for their investment in new ventures. A good example of such practices exists in the UK, where Her Majesty Revenue and Custom Office offers a 30% to 50% tax relief for investment in new enterprises through the Enterprise Investment Scheme (EIS)27 and the Seed Enterprise Investment Scheme (SEIS)28. Promoting angel investment is an important first step. However, more organic investment vehicles with larger funds are essential to complement, leverage and expand the initiatives of individual investors. Simply put, the virtuous circle of science, technology, entrepreneurship and innovation would fail to materialize without an appropriate funding mechanism. This is the focus of the next chapter.

4 FUNDING HIGH-TECH INNOVATION IN ITALY

4.1 Designing an Innovation Fund tailored made for Italy

Internationally the US has been looked at for inspiration in how to create an innovation-led economy and an ecosystem of innovative companies. The US venture capital29 model has been transposed into many European and Asian economies in an attempt to replicate the US success story.

Undoubtedly, venture capital has played a key role in the US race to the forefront of innovation in sectors as varied as telecommunications, internet service, electronics and biotechnologies. Whilst venture capital fuelled innovation has had a strong positive impact on the US economy, the investment funds involved have not always reaped attractive returns. For example, for more than a decade, the average returns from venture capital inside and outside of the US have been negative30 31 32 33 34.

The sustainability of the venture capital model has been repeatedly called into question32 33 34. With hindsight it is now possible to see that the current venture capital model really only suits a particular geography, type of company, and high growth and potentially “bubble” markets. The global macro-economic situation of the last few years and the innovation context of Italy (and many European countries) may well be unsuited to such model.

Clear signs of this mismatch and its consequences across Europe have already been pointed out by Abdul Guefor – European Head of Intel Capital, the largest venture capital fund in the world. At the Global Venturing Symposium held on May 18th 2011 in London, he observed that the number of VC firms in Europe has fallen from 600 to 400 during the period 2000-9, and the number of active firms was probably half this. The European venture capital industry is in danger of falling below critical mass, as has already happened in many regions.

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27 http://www.hmrc.gov.uk/eis/
30 BVCA Private Equity and Venture Capital “Performance Measurement Survey 2010”
31 NVCA “U.S. Venture Capital Index® And Selected Benchmark Statistics”, March 2011
34 Cambridge Associates LLC and NVCA “U.S. Venture Capital Index® And Selected Benchmark Statistics” December 31, 2010
There are however, signs that new venture funding approaches are emerging across Europe and they could provide interesting insights for Italy. France, for example, has examined the flaws in trying to import the US venture capital model and has developed alternative venture-like structures and new tax models. Companies such as Truffle capital\footnote{http://www.truffle.com/} draw their money from the stock market rather than as a time-limited fund. In the UK, companies like IP Group and Imperial Innovations\footnote{http://www.ipgroupplc.com, www.imperialinnovations.co.uk} have also shown that alternative structures exist that can finance innovation. In the latter two cases, a virtuous circle of universities, investment funds and corporations has been drawn into the model.

In the next few pages we put forward the key elements of a new funding model for innovation in Italy that draws on international best practices and takes account of the peculiar culture and nature of the innovation, economic and entrepreneurial environment in Italy. The ultimate aspiration is to create an investment fund that could grow in well-defined stages and achieve within 5-10 years the size necessary to impact and foster innovation and economic growth across Italy. We therefore describe the concept of an investment vehicle that starts small enough to allow an eco-system to be built around the fund without wasteful over-investment. After initial priming, the built-in mechanisms could scale the fund to a multi-billion Euro vehicle without substantial public money to support it.

Although we will meanly describe an investment vehicle, its success would depend on close association with a number of other parties:

1. Large corporate labs where there is often underexploited technology.
2. Governmental research centres and universities.
3. The management of the companies, trained and helped through formal business schools education and hands-on business development aid.
4. The government, which must consider the opportunity of replicating the US SBIR programs\footnote{http://www.sbir.gov/} and source products from SME’s as part of its procurement policy.

Large corporations also need encouragement to buy from, and act as channels for, the products of the start-ups. Clearly this will be on a commercial basis but typical large company procurement rules and payment terms can mitigate the risks of building a commercial eco-system from scratch. In essence, although the principal mechanisms involve creating a carefully grafted funding vehicle, it is essential that there is an ecosystem of players including universities, business schools, large corporations and service providers such as lawyers and accountants that also feel drawn to participate. The investment fund would rely on and enable high-tech clusters, as described in the previous chapter.

Finally, target sectors need to be chosen where Italian firms have the opportunity and readiness to easily access the larger international markets and establish a market lead that extends beyond Italy. GSM technologies provide a classic example of European companies (in this case, Ericsson and Nokia) that managed to create a European wide market and even a global leadership in the mobile communication industry, rather than following the US lead.

4.2 Overcoming the Problems with the US Venture Capital model

To begin, the mechanisms of traditional venture capital are examined in order to identify the aspects that need adjusting to best suit the Italian innovation context.
The funding of early stage innovative companies is commonly associated with venture capital. The basic model was invented in the 1960’s and has changed little since. Key features of this model are:

1. The funds have a 10 year lifetime; they invest for the first five years in new companies; the next five years consist of follow-on investments and exiting from the investments; exits are via trade sales or floating on a public stock market (Initial Public Offering - IPO); all the profits are taken as capital gains, which are immediately distributed back to the fund’s investors (so called Limited Partners); there are major tax advantages in using capital gains model, so dividends and other returns are not considered; and the Limited Partners have no involvement in the running of the fund. The fund managers’ benefit by charging fees of around 2% of the capital under management and taking 20% of any capital gains the fund makes. Investments are not normally done by a single firm but as a syndicate, and are normally structured so that multiple investment rounds occur with new investors brought in at each round. Each fund invests in a portfolio of 20-30 companies to spread the risk.

The model has been associated with major success stories with fabulous returns achieved by a small number of funds. However, if the long term returns are studied then - outside of the “boom” years - the average returns tend to be poor. The last decade has seen negative average returns in both the US and European venture capital industry, and only the top ten percent of firms in the USA and a handful in Europe have seen good returns.

In essence, the structure of VC funds dictates that:

1. The companies invested in can be sold or exited in a 7-10 year time scale.
2. The companies can attract a sufficiently large pool of investors willing to syndicate deals.
3. The fund itself is large enough to avoid being “washed out” or “crammed down” in new rounds and thus get no returns for its early stage risk taking.
4. The returns to the fund are structured as capital gains.

For early stage investors, this means that the investments need to be made in companies with very high growth potential, as a very small percentage of companies can grow from zero to a market capitalisation of 100 million euros in 7-10 years. The reason that the 100 million euros figure is so important is that it represents the value needed to attract the attention of most large companies for a potential acquisition or, alternatively, to create a “liquid” float on a stock market (IPO). Achieving this 100 million euros value typically requires a company to double its revenues every year for 5-7 years, starting from a 1 million euros revenues in year 2 at the very latest. Even in good funds and boom markets less than 20% of the invested ventures get near these targets. Furthermore, very few companies achieve better than a 10x return on invested capital inside the ten-year window. This means that to achieve the “easy exit” valuation of 100 million euros most will need at least 20m euros in capital. Early stage funds in Europe are typically less than 50 million euros in size and cannot deploy such capital alone. Unlike the US, investment funds in Europe are too small and insufficient in number to offer multiple syndication options. With fewer active funds, syndication to raise the money is very hard and done on terms that penalise early investors. Early investors face a grave dilemma: either they risk running out of capital for later rounds and thus being “crammed down” and losing all their deployed capital or they are forced to invest in smaller companies with a poor likelihood of a successful exit - a combination guaranteed to deliver the poor results European funds achieve.

38 Tom S. Lindström “Venture Capital Performance Determinants and Differences between Europe and Northern America”, Helsinki University of Technology, Institute of Strategy and International Business, 2006

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The final catch in the venture capital game is that fund managers raise new funds after around 4 years life of the old fund. Their ability to raise new funds is driven by the success of the old ones (hence the crisis at the moment in Europe where funds are closing rapidly following a decade of poor returns). However, a new fund normally comes with a stricture that it can not be used to invest in companies that the old fund created (to prevent the new fund effectively rescuing or subsidising an old fund). The capital a VC has to deploy over the 10 years is thus fixed at year one with no options to follow success with newly raised money. As a result of this, a handful of very large funds now dominate the US VC scene.

Furthermore, if we look at Italy, we see that many small companies are family owned. The owners are not interested in selling the company for capital returns. In such companies the typical VC approach of swapping the management because they fail to achieve aggressive growth rates is not practical. Italian companies are more likely to grow more slowly (perhaps even more realistically) and therefore more suited to return money in the form of dividends rather than capital gains. Such companies are not unique to Italy and form a major stay of the European and Asian economies. The key question is how to fund such companies whilst providing acceptable liquidity to the investors, entrepreneurial and management skills to the companies and a high economic growth.

From the lessons above, one can conclude that to fund innovation in Italy a number of new approaches must be contemplated:

a) A new fund structure is needed that enables a fund to raise more capital as needed, to deploy into the successful ventures.

b) There needs to be mechanisms to gain value from smaller investments and companies that reach a smaller market capitalisation.

c) There needs to be mechanisms to gain value that do not involve “exits”.

d) There needs to be ways to help an under-performing management team deliver without simply swapping the team out.

In the absence of an alternative model, in the last 5 years we have witnessed a sharp decline across Europe, as well as worldwide, in the number of venture capital firms. This has been particularly acute for firms with an early stage or higher risk focus. This decline has affected innovation, new venture creation, employment and the growth of a knowledge-based economy. The impact has been exacerbated in places where venture capital firms were less active (mostly the non Anglo-Saxon regions of Europe – as highlighted earlier), with the result that private capital investment in new ventures and innovation has now dried up almost completely. Shrinking nearly 1400 US VC firms to 900 in the period 2000-2009 still leaves a large pool (NVCA data); shrinking 600 VC European firms to 400 risks going below a critical mass (EVCA data). Such sharp decrease means there are not enough funds, money or skills left in the economy to effectively fuel innovation.

Designing a new fund structure that builds on the learning of the past 50 years of VC industry experience is fundamental to stand a chance to succeed in the investment field, to attract investors and liquidity and – last but not least- to re-ignite innovation, competitiveness, job creation and economic growth in Italy? Creating a fund structure that is sympathetic to the culture and finance structures in Italy is essential to start the process.

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39 EVCA Yearbook 2011
4.3 Venture Capital and the funding of Innovation in Italy

Italy is not immune to the problem described above of having below critical mass funds to support new ventures, high-tech clusters and innovation-centred economic growth. Recent statistics from the Associazione Italiana del Private Equity and Venture Capital (AIFI) 40 that up to the first semester of 2011 only 8% of the total 7.8 billion euros, i.e. 624 million euros, were managed by early stage venture funds. The total capital actually invested in early stage ventures in the first half of 2011 amounted to a very low figure of 40 million euros. Furthermore, historic data from the same AIFI report indicates that on average - in the period 2006-2011 – 14.5% of the total Italian Private Equity and Venture capital investment has gone towards high tech sectors, even looking past early stage funding to include expansion, buy-out, replacement and turn-around deals. The extremely low volume of capital and activities, especially in the early stage and high tech sector is the main reason why the Italian venture capital industry is hardly covered in any of European VC statistics 36. The set of figures discussed unequivocally points to the need for increasing the funds available in Italy for financing innovation.

In 2011, only 8% the 124 members of the AIFI were operating in early stage funding and – as we have seen above – only a fraction tended to focus their activity on high-tech innovation. Innogest Capital stands out as the leading Italian VC fund in early stage, high-tech investments 41. The fund applies the classical, US VC approach combined with a seed investment focus. Its investment portfolio is impressive for the quality and diversity of the companies supported. The fund applies many of the best practices recommended in the next sections of this paper, e.g., the willingness to operate hands-on and to provide active management support alongside any financial investment. However all the Italian funds studied seems to deviate very little from the American model in order to address the shortcoming explained in the previous section or the fundamental mismatches with the Italian innovation and entrepreneurial context. Building on the initial success of highly competent funds that operate according to the traditional US VC model, such as Innogest, there is now a concrete opportunity to take a more drastic departure from the establish model and rethink the mechanics of an investment vehicle specifically designed to foster Italian innovation.

Having looked at the venture capital landscape of Italy, we therefore believe that there are two crucial and urgent needs. First, the amount of funds available to finance new venture and innovation must be significantly increased. Secondly, the model for venture capital investment funds needs to be re-thought through to meet the specific needs and constrains of the Italian context. Addressing these needs/constrains and enhancing the viability of alternative investment approaches would also contribute to increasing the available capital to fund Italian innovation, especially in high-tech sectors. We devote the next section to introduce a new concept for an Italian investment vehicle.

4.4 Developing an Alternative Model for Italy

In developing a different model to fund innovation and stimulate growth of new and existing companies, one can contrast the classic venture capital model to the approach adopted by the Berkshire-Hathwaite fund created by Warren Buffet. VC funds are driven by early equity exits and focus on selling quickly for high capital gains; Berkshire-Hathwaite buys and holds “forever” using the capital growth of the underlying investments and dividend payments to drive its stock price higher. Interestingly, the Berkshire-Hathwaite model has been much more successful over

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41 http://www.innogest.it/page/9.html
the long run than the traditional VC. As mentioned earlier, average VC returns have been negative for more than 10 years in both Europe (around -4.5%, EVCA data) and US (around -2.5%, NVCA data). The invest-and-hold model is much more appropriate for family businesses and for the smaller market capitalization of the companies that most early stage investment creates. However, a new model is needed to provide a way of realising the value held in such illiquid vehicles. The fund management team also needs a different set of skills to invest in such businesses in comparison to those used by financially oriented funds that hold publicly quoted stock.

The proposal here is to create a publicly-quoted investment vehicle that would focus on the long-term value of smaller, illiquid Italian companies. Value would be created by growth of the underlying portfolio and investors would gain liquidity through the quoted investment vehicle and not by exits from individual investments. Effectively the investment vehicle would create “pooled liquidity” in the businesses it invests in. This model would impose much less aggressive growth requirements on the funded companies and be more attuned with the Italian ecosystem and the need to create sustainable economic growth.

The proposed route to get to such a fund and build up stepwise the experience of this different investment style would be as follows:

1. Raise around 20-50m euros as equity. This would be used to build the initial investment team and to invest in about 6-12 early stage start-ups in the first 2 years;
2. Acquire some portfolios of start-ups from institutions such as Universities or venture funds that have no method of gaining value from their illiquid holdings. These deals would be structured as secondary buy-outs but with the purchase being for equity in the investment vehicle;
3. Raise an additional 20-50m euros by a private placement for investing as follow on cash in the portfolio and for another 4-8 investments.

Stage 1 and 2 funds could be raised from regional and national administrations, the European Investment Fund (EIF), banks and pension funds, but also from corporations with strategic interests in the market and wishing to work with the start-ups to provide a stream of innovative products and services and from high net worth individuals with knowledge of the sectors. The shareholders would be active participants in the fund’s operations as the intention is to build a partnership network (see below). This also separates the fund from the VC model where investors have purely financial interests and are often stopped by the tax structures in getting involved in any of the fund’s decisions.

After these three stages the investment company should aim to hold a portfolio of around 40-50 companies. It should also aim to sign partnership deals with 3-4 major R&D facilities to give it a high quality deal flow. The combination can then be floated on a suitable public stock market to raise further financing capital, and include the explicit strategy of further rights issues for on-going investments. Comparisons can be made to the initial public offering of such companies as IP Group and Imperial Innovations; and the fund raising used by companies such as Truffle in France - as mentioned in the introduction of this chapter.

At this point the vehicle probably would have a market capitalisation of around 200 million euros. This is too small as a fund or to make an economic impact. However, the IPO should enable the fund to raise at least 100 million euros of further capital. It is essential that the fund is capable of putting up 100% of the investment in any successful company because the likelihood of syndication is very small. This means that the fund will float with a story that includes regular returns to the market for rights issues to continue investing in its successful companies. A fund that raises 100 million euros per annum for new and follow on investments is roughly equivalent to a 1bn euros US VC fund. That is, it is able to play with the “big boys”. Over a 5-10 year period
such a fund has the potential to become a multi-billion euro game-changer at the heart of an innovation ecosystem.

The fund would hold the companies it invested in “forever” as a strategic model and use dividend payments and other forms of returned capital to underpin its economics. Clearly some firms would be exited as in the traditional VC mode. All capital, whether from dividends or capital gains, would be recycled through the company to effectively create an evergreen fund.

Investors in the fund would gain from the rise in the capital value of the stock due to the rise in the capital value of the holdings, and potentially from a dividend payment. The nearest long term equivalent is the UK company 3i, which was also started to kick start economic growth in the UK. Unfortunately it is now a quoted private equity company with little interest in start-ups. Consideration would need to be given to tax arrangements or similar so that the fund proposed here did not over time drift into being another private equity firm.

To summarise, the fund model proposed here is designed to address the weaknesses of the traditional US VC model (see above) and fit the strengths and characteristics of the Italian innovation ecosystem. If properly executed, the model could not only offer a viable investment vehicle for managers and investors, but also create the best condition for the sustainable growth of Italian high tech ventures.

**Key Features of the Fund**

**Market Focus**

The fund could invest in any market sector. However the goals are: to start small; to bring operational skills into the investee companies (see below); to exploit an ecosystem of partners and large corporations; and be able to compete with international funds. In view of these objectives it would be very important that any investment be focused in sectors where all the components can be brought to bear at a critical mass. Additionally the fund would need to operate in sectors where its presence in Italy (and Europe) gives a clear advantage.

It is very likely that only a handful of sectors would fulfil the requirements listed above and it is also possible that such sectors would represent cross-over areas, i.e., areas of convergence of two or more technologies, industries or markets. Identifying such sectors would be a demanding but absolutely feasible task for any experienced venture capital investor. We would recommend that a separate exercise be devoted to the effort of identifying the focus sectors for the proposed investment vehicle. Purely for explanatory purpose, we provide here two examples of emerging cross-over sectors. These are the cross-over areas between IT and Energy and the similar cross-over between IT and Health.

- **IT and Energy** - Europe and Italy have a strong focus on green energy and energy management. Italy already leads in the deployment of smart meters, having already installed 30 millions of them in 2005 with a resulting 5% reduction in energy usage. Italy is connected into a single unified grid to most of Europe and the energy industry structure is opening up so that power generation, distribution and retail are becoming separate functions. This means that a new layer of services and applications that runs on top of the delivery of power can be deployed to create and enhance smart grids. Local storage, smart meters and displays can all be combined into a wide range of new charging, management and information schemes. The combination of all these factors and emerging

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43 [http://www.guardian.co.uk/environment/2008/feb/20/energyefficiency.smartmeters](http://www.guardian.co.uk/environment/2008/feb/20/energyefficiency.smartmeters)
technology/industry trends makes the IT-Energy sector a perfect example of a highly attractive focus areas for innovation and new ventures.

- **IT and Health** - Looking at the medical world, it is clear that if healthcare costs are to be contained in the context of growing demand it is necessary to find new ways of managing, delivering and participating in medical services. The state-wide systems in Italy provide scale and opportunity to create, pilot and develop solutions ready for global markets. The penetration of smart phones in Italy, combined with the emergence of cloud server infrastructures, creates a concrete opportunity for achieving continuous sensing, point of care diagnostics and rich patients’ databases that can be used for medical prevention, condition monitoring and other telemedicine applications. Throughout the spectrum of forthcoming remote healthcare applications, privacy protection and patient trust will play a key role in driving adoption. The advancements of the European privacy legislation and the related debate around the use of personal data, creates a very favourable context in Italy for the safe launch of new Italian business in the IT-healthcare space.

**Operational Skills**

The management make-up of early stage investment vehicles varies considerably between the US and Europe, as shown in the graphs below (source: McKinsey and Company).

The first pie chart shows how the management teams in US VC firms mix finance, entrepreneurial and operational skills.

In comparison the European pie chart shows a predominance of finance backgrounds.

As a result of this imbalance few European VC’s are capable of putting the required management skills and knowledge into their early stage investments. Most early stage companies lack the money to bring in sufficient outside skills and the investors provide very poor advice and help; and often are ill equipped to identify the problems. This can be particularly severe in Italy where a much smaller pool of entrepreneurs can be tapped in for such management oversight. Furthermore, if the skill blend is important, then a fund needs to have a clear market focus, as the entrepreneurial knowledge and operational expertise tend to be more narrowly defined than financial skills.

The funding vehicle described here should therefore seek to recruit entrepreneurs and operational experts directly into the fund to provide a pool of expertise that can be used across the portfolio and in specific companies. These in-house experts will be able to provide market, business and technology analysis of new investments as well as providing support and management skills operationally at the level of individual investee companies. Ideally, no more than 30% of the investment team should consist of people without direct business experience or with purely financial background.

The fund could also partner with world leading training and teaching organisations to enhance the skills of the managers in the portfolio company. A willingness of the management team to learn will be considered a key criteria in investing, as many of the possible investment contexts in Italy would not easily allow changing the management (this could be the case of most innovative but family owned Italian SMEs). The model should therefore be to train, support and strengthen management teams to create long-term value. As the proposed fund has longer horizons than a
traditional VC fund, the model of simply switching out the management when problems occur would become less critical.

The Italian Factor

Italy is rich in design companies and artisans. It has a strong academic research base that is still largely unexploited. It is a market leader in the adoption of mobile technologies and the deployment of smart meters. It has one of the world’s most extensive healthcare systems, with both needs and opportunities for radical innovation, due to factors such as aging population, financial pressure and a strong track record in medical research. If all these expertise and assets can be blended into a new generation of product and services there is no reason that “the Italian factor” cannot become internationally known just as Italian food carries a label for price and quality around the world.

Ecosystem benefits and socio-economic impact

Figure 11

Source: compiled by the authors

The fund should provide the essential investment capital and management expertise necessary to kick-start and foster economic growth. As illustrated in the diagram above, the proposed fund has the potential to unlock benefits for a wide range of stakeholders. A virtuous circle of beneficial interactions could be created between large industrial players, academic research institutions, business schools, investee companies and the fund itself. This is exactly the kind of high-tech cluster, whose benefits have been discussed in the previous section. The investment vehicle described here would act as a seed for the creation of high-tech clusters.
In this scenario, the investee companies would operate and prosper within an innovation network that is a common feature of many high-tech and entrepreneurial clusters worldwide. As observed in places like Silicon Valley or Cambridge UK, a balance can be rapidly achieved between the contributions and gains of all the parties involved in such ecosystems. This leads to the establishment of a resilient economic environment, characterised by continuous innovation, sustainable growth and strong societal impact.

The fund could seed and feed such an environment by acting as a catalyst of investment capital, management skills (including skills to foster human capital and intellectual property), scientific expertise, technologies and partnerships, as well by fuelling new products and service offering. It would connect Italian players (industry, academia and business schools) with international counterparts to ensure an open innovation approach that will help to capitalise world-wide on the best relevant knowledge and will support marketing internationally the products and services that the innovation eco-system will create. In contrast to the ‘silicon valley’ approach where geographical innovation clusters are created, the fund could be centrally managed but operate in a distributed way, letting family enterprises develop in their territory of origin, thus contributing to a distributed innovation eco-system in line with Italy’s socio-economic infrastructure.

The success of high tech clusters and eco-systems is based - among the many key factors - on the achievement of early champions and their success stories. This is also a fundamental requisite for the success of a newly established investment fund. This alignment further increases the synergy between the ecosystem and the fund.

**The Larger Vision**

The success of the proposed fund would steadily grow a portfolio of sustainable, revenue generating companies and lead to a growing market capitalisation. Ultimately, the goal would be to create – in well planned stages and over a 5+ year period - a multi-billion vehicle that will be large enough to drive innovation in Italy, and provide a valuable vehicle for investors to hold stock in.

An investment vehicle that can fund smaller, long term growth companies, help their managers acquire key skills and still provide solid and liquid returns for investors should be compelling for Italy, as it provided an alternative to the US model for funding innovation that is more attuned to the Italian culture and ecosystem.

It is likely that, to remain focused on its core objectives of investing in small companies, over time the proposed investment fund would split into a number of market sector focused vehicles. This would help avoid what happened to its spiritual predecessor -3i - that morphed from an early stage investment vehicle into a classic late stage private equity firm.

Trying the model could be relatively inexpensive, due to the small initial fund size. Success would not only be transformational economically, it might also create a new innovation image for Italy. Evidence of the high feasibility and relatively low financial cost of trying the proposed model can be found in the recent decision by Ipswich and Suffolk Region Administration (UK) to trial the very same model proposed here. In this case, the overall assessment of the proposal and the decision to fund the first phase of the investment vehicle has taken less than 6 months. The proposers of the vehicle have been immediately appointed to establish and run the initiative. Their first tasks include appointing investment managers capable to identify, assess and fund new

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"The investment vehicle described here represents a fine tuned version of a funding concept created by Dr. C. S. Winter (New Venture Partners and Brightstar Innovations), Dr. C. Marinelli (Nokia) and Dr. M. Beltrametti (Xerox), June 7, 2011. The original funding concept is described in a white paper available at http://brightstar-innovations.com. Dr. Chris Winter is currently discussing an implementation of the concept with the Ipswich and Suffolk administration."
ventures as well as impactful innovation projects from existing SMEs. The first investments in new ventures are expected within 6 to 9 months from the inception of the vehicle.

4.5 Proposed actions

In our "vision", a team of people (in the following the Team), including the creators of the fund concept, would execute the following actions:

1. The investment vehicle described above, its rationale and socio-economic impact should be presented to 2-4 Italian Regions, ensuring their support and cooperation to raise the initial fund from at least one Region.

2. Failing to secure the required 20-40 M euros of seed capital directly from a Region, an investment proposal should be submitted to the European Investment Fund;

3. Once the seed capital is secured, the Team would identify and appoint a small group of experienced R&D and investment managers that could plan, manage and execute the proposed innovation model;

4. The fully-staffed team would then move to identify a handful of candidate locations to create pilot innovation clusters;

5. The fund will further focus the technology application and investment areas based on available technology supply and service and product opportunities;

6. The fund would then create a deal flow of potential investment, perform the required due diligence through its investment managers and proceed to the creation of 2-3 initial start-up companies.

After step 1 and 2, a timescale of 6 months for step 3, and a further 6-9 months for steps 4 to 6 would be considered feasible.

5 SUMMARY AND ROADMAP

This paper has analyzed the strengths and weaknesses of the Italian innovation system. We underscored that investment in R&D is low, with limited public support, but also that there are more than a few examples of high-quality research and successful innovations.

We argue that public policy can support the development of the Italian innovation system through a new, scalable funding mechanism. This model, more appropriate for Italy than the traditional venture capital model, would provide guidance to industrial clusters and nurture a virtuous culture of interactions between large industrial players, academic research institutions, business schools, investee companies and the fund itself.

In addition, we argue that higher investment in the teaching and practicing of innovation management in Italian business schools, also involving professional experts, would raise corporate awareness about intangible assets.
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