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Strengthening French Venture Capital

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Bank loans have not adapted to the financing of innovations and start-ups as they cannot manage fixed terms of repayment. The emergence of our "unicorns" depends on a dynamic venture capital industry. Successes like Criteo or BlaBlaCar, and annual growth of more than 100% in 2015 demonstrate the progress of French venture capital. It should however fill the gaps at different stages of the financing chain if it wants to catch up with the United States and the United Kingdom: French funds are still too small and too localised; business angels, which play a key role in start-up creation, have minimal financial influence in comparison to other European countries in United States; the European market for listing of companies and sales is less dynamic than in the United States, while universities take little part in the innovation ecosystem.

This *Note* analyses Government intentions *via* the French public investment bank (Bpifrance), its linkages to the Investments for the Future Programme (IFPs) and taxation of entrepreneurs and investors.

The history of the sector in the United States demonstrates that government intervention can play a key role, notably through a knock-on effect on private investment and the support of the emergence of an independent innovation ecosystem. Public action can also be justified to stabilise funding throughout the economic cycle or for particularly risky and/or long-term projects. In France, Bpifrance, for example, has played an essential role in financing venture capital funds during the financial crisis of 2008, and during the recent emergence of a technological capital-growth ecosystem. However its doctrine of direct investment, and that of IFPs suffers from a lack of clarity and overall coherence. Government intervention is also justified to support funds of funds as they suffer from the virtual absence of long-term private investors in France. However this intervention should faster, and not to prevent, the emergence of an independent and internationalised venture capital industry. Lastly, the independence of Bpifrance while continuing to depend on the quality of its directors, should be based on sound governance, with greater use of experts, including foreign ones.

In parallel, improving exchanges between start-ups and universities could faster the involvement of the scientific community in the entrepreneurial momentum.

As for taxation, it should encourage successful entrepreneurs to become business angels, to enable the French ecosystem to benefit from their capital and expertise. We recommend facilitating the reinvestment of capital gains through an entrepreneur-investor account. Taxation of foreign investors which subscribe to venture capital funds should be clarified, and access should be eased.

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The development of a start-up goes through several phases: Research & Development (R&D), Start-up, Take-off, Development, and Maturity & Sale (*cf.* box 1). Strictly speaking, "venture capital" means financing provided by funds at the end of the Start-up phase and during Take-off and Development. By extension, venture capital is often used to qualify the entire financing chain. We refer to "venture capital" here in this broad sense.

Venture capital acts as an accelerator in the innovation[1] process. Strengthening venture capital in France is therefore a major strategic challenge. After a brief analysis, we make two series of recommendations, respectively concerning the processes of government intervention and taxation.

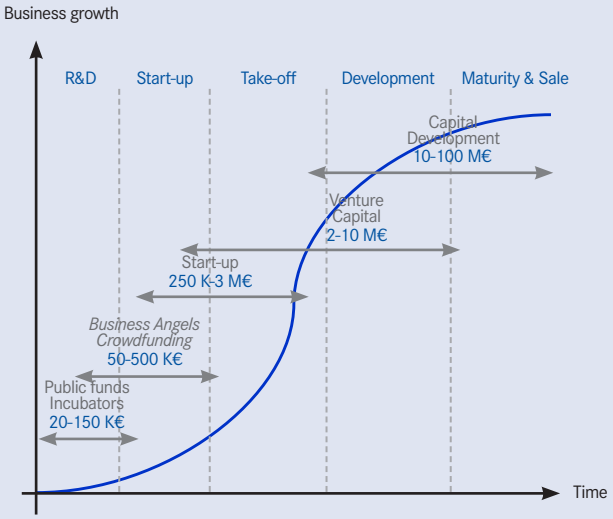
Venture capital in France: Diagnosis

A lack of attractiveness of the French market

Venture capital funds are habitually closed off, managed by professionals and funded from private (pension funds, insurance, banks, major companies, private individuals, etc.) or public sources (States, public financial institutions). The European Venture Capital Association (EVCA) assesses the amount of venture capital in the economy of each European country, either as a fund destination (whatever its geographical origin –activity financed), or as an investing country (whatever the geographical destination of the funds– financing activity). The difference between the two "market shares" can be read as an indicator of net attractiveness. A positive difference means that activity financed by venture capital represents a greater portion of the economy than the financing of venture capital: the country "imports" venture capital needed for financing innovative companies. This is the case in the United Kingdom and Germany (figure). France is in the opposite situation: the activity of its venture capital funds slightly exceeds the investment in innovative companies in France, so that "excess" venture capital is invested abroad.[2]

The main reasons given by international investors for France's lack of attractiveness as a place for establishing start-ups of significant potential are employment regulation, taxation, the perceived risk of public "anti-business" interference, exemplified by Dailymotion and Uber, or the lack of internationalisation of the Parisian marketplace. In the 2015 Compass ratings, Paris was ranked 11th in the world's innovation ecosystems, behind London (6th) and Berlin (9th).[3] In comparison with London, Berlin or the Silicon Valley, the Parisian

1. The financing chain for innovating companies



Phase 1. Research & Development (R&D)

In the first phase of development, when the business doesn't yet exist and the business model is not yet complete, financing is basically limited to "love money" (FFF for Family, Friends and Fools), public grants (grants, honour loans) or aid from incubators or accelerators.

Phase 2. Start-up

This is the first capital investment in the business. The funds may come from business angels, public funds (grants) or appeals for private savings such as crowdfunding, or from specialised funds (creation funds).

Phase 3. Take-off

It is generally at this stage that real venture capital is invested, essentially *via* specialised funds but, here again, also *via* public funding.

Phase 4. Development

During the growth phase, capital-growth funds are also invested, enabling the company to extend the volume of its business and to attack new markets.

Phase 5. Maturity & Sale

This is the final phase: resale of the business (usually to major companies wanting to acquire the assets, ideas and/or technologies developed) or stock exchange entry.

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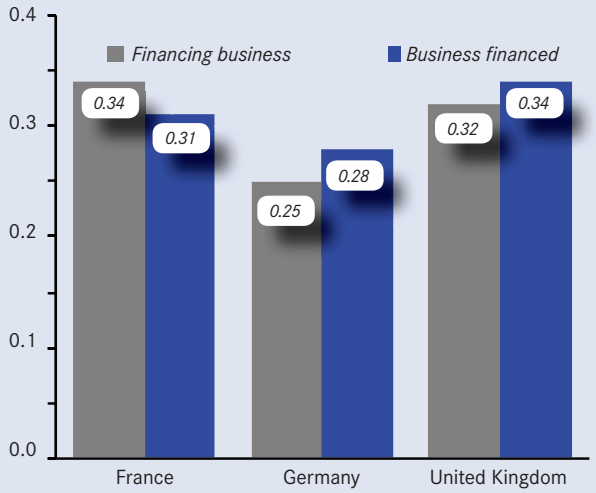
[1] See, for example, Kortum S. and J. Lerner (2000): "Assessing the Contribution of Venture Capital to Innovation", *RAND Journal of Economics*, vol. 31, no 4, pp. 674-692.

[2] The lack of attractiveness of France for venture capital is confirmed by the small foreign investment, 850 million euros in 2014, ie., 9.4% of the total sums invested, as against 37.1% for Germany, *cf.* Invest Europe Research (2016): *European Private Equity Activity Data 2007-2015*.

[3] *The Global Start-up Ecosystem Ranking*, 2015.

Amount of venture capital funds and businesses financed, 2015, as a ‰ of GDP



Read: Narrow definition of venture capital: investments made for the launch, and the early development of a business.
Source: EVCA (2015).

"tech" start-ups employ few foreign talents and are overwhelmingly financed by local investors (table 1). According to a GP Bullhound[4] study, in 2015, France had only three "unicorns"[5] globally valued at 6.7 billion dollars, whereas Germany, Sweden and the United Kingdom had, respectively, 4, 6 and 17, valued at 18, 26.5 and 40.4 billion each.

1. Foreign workers and capital in "tech" start-ups, in %

	Paris	London	Berlin	Silicon Valley
Foreign employees	22	53	49	45
Pools of local investors	73	53	64	61

Source: Compass (2015).

French venture capital is growing strongly, with 484 operations totalling 1.81 billion euros of investment in 2015, ie., twice the sum invested in 2014.[6] These performances place France second in Europe after the United Kingdom for the number of operations (21% of the total), but only third after Germany for the sums invested: French venture capital on average finances smaller operations. The comparison with the United States is even less flattering: a US start-up benefits on average from 8.3 times more development capital than a European[7] start-up.

Observation 1. French venture capital is dynamic, but it raises funds of more modest size than elwewhere in Europe. Its successes are fewer and more limited, and the French ecosystem suffers from a lack of internationalisation.

Weakness of the business angels ecosystem

According to the EVCA, the majority of French investments in venture capital (in broad terms) is concentrated in the Take-off phase. The financing of the R&D and start-up phases is more difficult, especially due to the lack of business angels (BAs). According to the EBAN,[8] BAs play a key role in the creation of innovating companies. They enable to make up the difference between financing provided by the entrepreneurial team (including its personal networks) and financing by a venture capital fund. In 2014, they represented 73% of European Start-up phase investments, a sum of 5.5 billion euros.[9] However, the economic influence of BAs is relatively low in France: in 2013, their investments represented 1.7‰ of French GDP, as against 2‰ in Germany, 4.4 ‰ in the United Kingdom and 4.6 ‰ in Sweden.[10]

According to FranceAngels, the French federation of BA networks, en 2015 France counted 10,000 BA (1 for 6,600 inhabitants) federated in 76 networks.[11] In the same year, BAs effected 386 operations for a total sum of 41.2 million euros.[12] France is noteworthy for the small sums invested: the average investment of a French BA is half that of an English BA and 2.5 times less than a German[13] BA. In the United States, the Center for Venture Research of the University of New Hampshire counted 265,400 BAs

[4] Independent Technology Research, by GP Bullhound (2015): *European Unicorns: Do They Have Legs?*

[5] Name given to start-ups valued at over a billion dollars.

[6] EY (2015): *Baromètre EY du capital-risque en France*.

[7] Comparison between the statistics provided by the EVCA and the NCVA (US equivalent of the EVCA).

[8] Established in 1999, the European Business Angel Network (EBAN) (whose full name is the European Trade Association for Business Angels, Seed Funds and Early Stage Market Players) is a pan-European organisation of 170 member bodies and 59 countries and which represents the community of initial phase investors.

[9] The same year, venture capital funds provided 26% of creation financing and only 1% of crowdfunding platforms.

[10] *Cf.* European Commission (2015): *Business Angels and Access to Finance*, Figure 5.

[11] In many countries, the BAs are grouped in more or less formal networks for sharing the work of due diligence (project analysis), spreading risk and hence investing more.

[12] FranceAngels (2015): *L'investissement des* business angels *en France*.

[13] European Business Angels Network (EBAN) (2014): *Statistics Compendium*, EBAN. This study shows 4,320 Bas in France in 2013.

(1 per 1,200 habitants) for 2010, financing 61,900 new companies, for a total of 20.1 billion dollars. These tens of thousands of new companies constitute a pool in which venture capital can invest. Ultimately, France is noteworthy not only for its small number of BAs, but also for the small sums they invest in the projects they support.

Observation 2. France suffers from too few business angels with limited financing capacity.

Difficulties in the Maturity & Sale Phase

A study by France Digitale in 2013 shows that the environment for Maturity & Sale in Europe is considered as the most critical[14] point. Exit, which enables investors and entrepreneurs to acquire a full or partial return on their initial investment, can take three forms: Listing of a company (IPOs: Initial Public Offerings), sale of the business to a purchaser, or sale (in whole or in part) to a specialised private equity fund. A favourable exit market is fundamental, as it creates a positive feedback loop in the early stages of the financing chain. While there is no consolidated data on listing of companies and sales to private companies, the qualitative France Digitale study states that nine out of ten European start-ups are sold to US purchasers.

Observation 3. The market for listing of companies (IPOs) or sale is less dynamic in Europe than in the United States.

Performance below the European average

According to the French association of investors for growth (AFIC), the net average venture capital internal rate of return (IRR) assessed over ten years was – 0.2% at the end of 2013, the average of the best 25% being 11.8%.[15] In Europe, the net average IRR for the same year was 1.68%, the best 25% being 15.5%.[16] This difference in performance may also contribute to the low appetite of foreign private capital for French venture capital. It does however merit closer attention, since a 2015 report of the *Cour des comptes* (French court of auditors)[17] on investment funds for innovation (FCPIs) and local investment funds (FIPs) showed a net average IRR based on a sample of tax funds of – 5.1% for 2014, much lower than the average AFIC, thus indicating a lower average. It would be useful to assess the net performance of French venture capital funds subscribed by institutional investors, without including FCPI/FIP tax funds to enable assessments on a comparable basis with other European funds. These poor rates of return figures suggest that there is not a main shortage of capital dedicated to start-ups in France.

Observation 4. The return figures for French venture capital funds are below the European average.

The role of government intervention

There are a number of arguments that justify government intervention in the financing chain for innovating companies:

- *lack of long-term private investors.* France lacks long-term funding. For regulatory reasons (capital ratios), banks and insurance companies can only invest limited sums in long-term risky projects. They also have management efficiency constraints (time spent/sum invested) and maximum investment ratios for subscribed funds, which naturally favours large funds. Above all, France has neither pension funds nor university endowments, which in other countries have long-term objectives and can therefore absorb risks. However, venture capital has an unforeseeable, historically low rate of return which takes 7-10 years to realize. Bpifrance's investment policy for private funds of funds[18] is designed to encourage the emergence of benchmark long-term French investors. The *France-Investissement* programmes for their part aim at mobilising insurers towards venture capital;
- *creation of an ecosystem.* In the United States, successful entrepreneurs tend to re-invest their profits in other companies, creating a multiplier[19] effect. They contribute not only to the financing in the Start-up phase, but also to entrepreneurial competence. This channel is less present in France, especially due to successful entrepreneurs going abroad. This French difficulty of enhancing the role of private investors of this type can justify a policy of priming the pump (this is the *raison d'être* for the *Fonds national d'amorçage*, French national business creation fund), but such a policy is not built to last. Another solution would be to create the conditions (including tax incentives) encouraging

[14] France Digitale (2013): *Web Investors Forum, Boosting Digital Startup Financing in Europe*, Report for the European Commission.

[15] AFIC-EY (2015): *Performance nette des acteurs français du capital investissement à fin 2014*. The net average domestic yield rate increased to 2.1 at the end of 2014.

[16] EVCA-Thomson Reuters (2013): *Pan-European Private Equity Performance Benchmarks Study*.

[17] Cour des Comptes (2015): *La dépense fiscale ISF-PME*, Referee no S2015-1433, 26 November.

[18] The business of the public investment bank (Bpifrance) is detailed below. Venture capital funds invest directly in start-ups. They usually specialise. The funds of funds invest in specialist venture capital funds for spreading risk.

[19] Gompers P., J. Lerner, D. Scharfstein and A. Kovner (2010): "Performance Persistence in Entrepreneurship and Venture Capital", *Journal of Financial Economics*, vol. 96, no 1, pp. 731-764.

entrepreneurs to stay in France;

- *counter-cyclical policy.* The capital-innovation market is pro-cyclical: provision of finance increases when the economy is in upswing and declines when during downswing. However, innovation needs stable financing. Government intervention is therefore justified for stabilising investment over time. Bpifrance's investment in funds of funds during the financial crisis of 2008 therefore enabled French venture capital to survive, despite the departure of international investors. This argument makes sense: it is in that effective some generations of entrepreneurs have no access to favourable financing conditions. However, it leads to the political problem of reducing the influence of an institution such as Bpifrance at the spike of the cycle;[20]
- *externalities and subsidies for R&D*. Some investments produce significant profits for the community, but are insufficient for the private sector, which can lead to under-investment in innovation. However, government intervention in this case can use more direct (and transversal) subsidy systems rather than venture capital.

In fact, the economic debate is not so much on the usefulness of government intervention as on its procedures, their calibration and above all their capacity to stimulate private initiative. It is useful to remember that venture capital in the US, systematically cited as an example, is in part constructed *via* sizeable public investment programmes and continues to rely on government intervention. The 1958 Small Business Investment Company programme (SBIC, an integral part of the Small Business Act, SBA) and even the Small Business Innovation Research (SBIR) programme of 1982 strongly supported the US[21] venture capital sector.

However, France distinguishes itself by the significant government intervention in venture capital. In 2012-2015, the share of new funds raised by venture capital originating from public institutions[22] was much higher in France than in the United Kingdom and the Nordic countries (table 2).

Bpifrance is a major player in direct investment in start-ups. According to tech.eu, it seems to have been the most active European investor in the 1st quarter of 2016, with 15 operations, ahead of Index Ventures (10 operations), one of the first pan-European[23] funds. Bpifrance is also very active in indirect investment since it participates, *via* 262 partner funds in 2015, in half of the French capital-innovation[24] operations.

2. Distribution of private equity funds raised per type of investor, 2012-2015, in %

	Germany[a]	United Kingdom[b]	Nordic Countries[c]	France[d]
Public institutions	22.3	2.9	13.4	22.3
Family offices and private individuals	18.8	6.5	6.9	19.1
Insurance companies	8.4	9.6	4.3	16.6
Funds of funds	15.5	18.6	22.1	14.7
Pension funds	21.5	36.3	27.4	11.0
Banks	6.1	2.2	5.6	7.2
Private companies	3.6	1.8	1.5	5.0
Sovereign funds	0.7	15.4	10.5	2.7
Capital markets	0.2	1.6	1.5	0.8
Academic institutions, donations and foundations	3.1	5.1	6.6	0.8
Total	100	100	100	100

Notes: [a] Germany + Switzerland and Austria ; [b] United Kingdom + Ireland; [c] Denmark, Finland, Norway and Sweden; [d] France + Belgium and Luxemburg.

Source: EVCA.

Another French particularity is the small contribution of universities to innovation financing. Apart from the funding issue, the close links between the universities and innovation ecosystems are now well-known, due to examples such as the Silicon Valley in the US and the Wadi Valley in Israel. Historically, the US Bayh-Dole Act, adopted in 1980, has played a fundamental role. This mechanism, which gives universities and SMEs the intellectual property in inventions resulting from research conducted with funds from the Federal Government, facilitates technological transfers between universities and companies. The programme also enables the diffusion of entrepreneurial culture, using courses on the creation of companies and/or the participation of students in the analysis of capital-investment projects conducted by the university. More and more US universities have their own incubators and significant resources through their foundations, which they partly invest in venture capital.[25] The links between universities and companies are more complicated in France, despite the efforts made. A scientist who has obtained results which may be diffused through services, products or software, must declare the invention at his university's commercialization service, which will then be taken

[20] Even though a top of cycle exodus of some of Bpifrance's personnel to the private sector can be expected, for increased pay.

[21] For a detailed description of these systems, see Villemeur A. and A. Alexandre (2008): "Le capital-investissement et ses leviers pour accélérer l'innovation" in Private equity *et capitalisme français*, Rapport du CAE, no 75, La Documentation française.

[22] The EVCA uses this term for local, regional, national or European agencies or institutions for innovation and development (including the European Bank for reconstruction and development, EBRD, European Funds for Investment, EFI).

[23] Tech.eu (2016): *European Tech Funding Report*, Q1 2016.

[24] *Source*: Bpifrance. We note, however, that despite strong growth in the funds of funds business (+ 65% over 2012-2015), the Bpifrance ratio of influence has remained stable since the start (around 20% in innovation funds, 17% without the national creation fund, FNA).

[25] See Villemeur and Alexandre (2008), *op. cit*.

charge of by a transfer subsidiary (for example, a technology transfer accelerator, SATT). If the inventor wants to participate in the start-up creation, appearance in front of the *Commission nationale de déontologie* (French national ethics commission) is mandatory.

Observation 5. Government intention in the financing of venture capital is greater in France, but universities participate less in the innovation ecosystem compared to other countries.

Public funds in venture capital: Which policy and what governance?

Public institutions have played a structural role in venture capital, particularly in the context of financial crisis recovery and, according to those in the sector, they seem on the whole to have been conducted with professionnalism. They develop, however, a certain fragility over time and need to be regularly reconsidered, regarding overall coherence of forms of public intervention.

Reasons for and dangers of government intervention

The reasons for government intervention in financing young innovating companies have been set out above. They aim at compensating "market failures", such as the existence of positive externalities linked to innovation, the pro-cyclic nature of private financing and the private sector's difficulty of financing certain particularly risky and/or long-term segments, or creating a dynamic ecosystem. In addition, there is the lack of pension funds and private financing in the start-up phase in France. Government intervention, however well-intentioned, has certain drawbacks:

- The State, in general, has no special skills in detecting promising sectors and companies; it does not better at "choosing winners" than the private sector;
- Government intervention can oust certain private entities as it *de facto* has not the same profit and capital requirements;
- Pressure groups can, *via* the political process, obtain other options than those chosen by independent experts;[26]
- Politicians can be tempted to use government intervention for electoral purposes, whether to obtain the votes of targeted groups or to position themselves on strong and influential public opinion themes;
- Similarly, it is very difficult to end public initiatives, whether or not the initial project seems to be justified. These factors demonstrate that industrial policies are not always fruitful in the long-term and that institutions multiply them over time;
- The significant influence of the public sector can be regarded negatively by foreign investors, which might consider Bpifrance as the "strong arm" of a French State with a "protectionist" reputation (especially after the conflicts with Uber and prevention of the Dailymotion sale), or fear geographical quotas for French market exposure.

Bpifrance: A fragile success

Created in 2012 by fusion of Oséo, CDC-Entreprises, the FSI and FSI-Régions, the French public investment bank (Bpifrance) is 50% State-owned and 50% owned by the *Caisse des dépôts et consignations* (French deposit and consignment office). Its Managing Director (MD) is appointed by the Minister of Economy. Its Board of Directors has 15 members: 8 shareholder representatives, 2 regional representatives, 2 staff representatives and 3 qualified personalities (including the MD). Bpifrance was created to finance companies from the Start-up to the Maturity & Sale phases, by transmission of loans, sureties and shareholder equity. In partnership with Business France and Coface, it also accompanies exporters and helps with their innovation projects. Only part of its business is concerned with venture capital. This is divided between funds of funds and direct funding (box 2).

According to the Grandguillaume report, Bpifrance has a fixed objective of a positive overall return, around 3 to 4% per year on shareholder equity, for the whole institution.[27] Performance should be assessed over time: the rationality of recent decisions can only be assessed over several years. Mid-2014, the result shown by the capital-investment branch, as from 1998, was an overall return on investment of 1.10 euros for 1 euro invested (with 0.46 euros in latent capital gain).[28] This type of "return" on investment does not take into account the duration of capital mobilisation, which renders interpretation difficult; it is clearly less than 3% p.a. It is also a financial return, whereas ideally, one should assess the social profitability of the investment.[29]

Many actors interviewed by us emphasised the competence and independence of Bpifrance's current teams, while questioning the durability of a virtuous balance, which seems strongly dependent on the current Board and not on the institutions themselves. The institution seems susceptible to future political pressure.

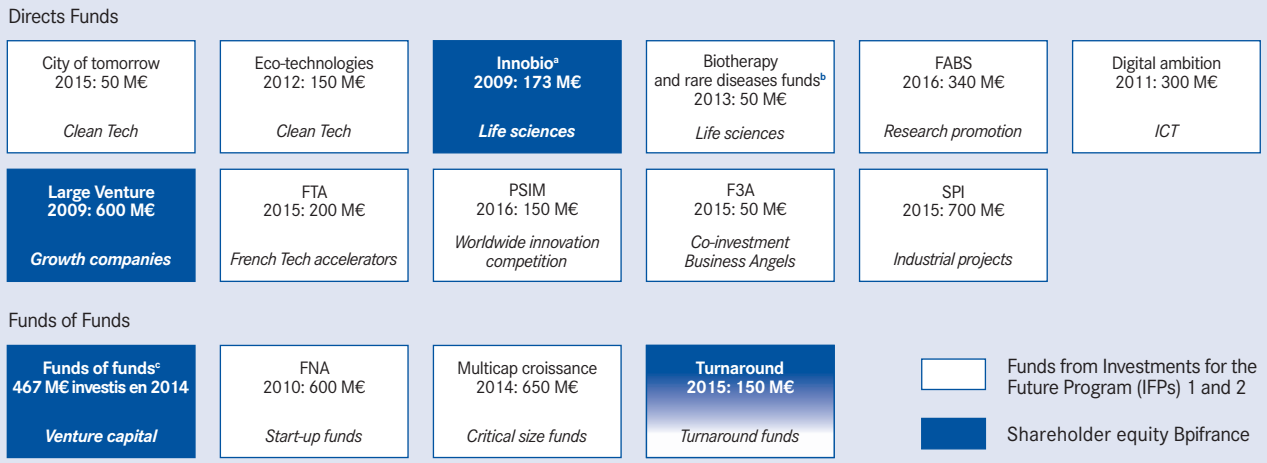
[26] See Lerner J. (2009): *Boulevard of Broken Dreams: Why Public Efforts to Boost Entrepreneurship and Venture Capital Have Failed and What to Do About It*, Princeton University Press.

[27] Grandguillaume L. (2015): "Banque publique d'investissement", *Rapport d'information de l'Assemblée nationale*, no 3097, September.

[28] Bpifrance (2014): *20 ans de capital investissement en France, 1994-2014*, Banque publique d'investissement.

[29] A negative financial performance is not necessarily incompatible with efficacity, since Bpifrance's role is not to finance projects suitable for the private sector.

2. Business of Bpifrance in 2015 (current)



Notes: [a] Including private financing; [b] Including Telethon financing; [c] 2014 and non-current flows.
Sources: Bpifrance, CGI and DG Trésor.

The need for a clear overall policy for encouraging increased empowerment of the private sector

The systems for assisting and financing innovation in France are multi-layered and their complexity and internal incoherence are frequently criticised in public[30] reports. This criticism inevitably affects Bpifrance and the other arms of public investment, such as the Investments for the Future Programme (IFPs). In fact, the "objective function" of Bpifrance is complex, since it covers several business segments. In practice, should the public entity finance projects with strong social profitability but little financial profitability, which do not interest private players or should it, on the contrary, aim for enhanced financial performance?[31] This question is even more complex as Bpifrance acts on its own account but is also often the operator selected by the *Commissariat général à l'investissement* (CGI, French investment directorate) to implement the IFP associated with the venture capital and start-up sectors (table 2). As regards its shareholder equity, Bpifrance has to act as a bank (although with an overall profitability target lower than the private sector), while respecting capital ratios. The investments made under the IFP can, on the other hand, accept a higher level of risk, but they are still subject to the prudent investor rule.[32]

While industrial policy can be justified by market failures, it is also evident that the State has no special skill for selecting and assisting future unicorns. We have prepared a general checklist for industrial policy which should be applied to the part of Bpifrance's activity which derives from industrial policy, including IFPs:

- Identify the reason for the market failure to enable a more effective response;
- Use independent and qualified expertise to select projects for and recipients of public funds;
- Assess the offer and not only the societal demands;
- Adopt an industrial policy which does not distort competition between companies;
- Make *ex post* assessments and publish their results; provide the programme with a "*clause crepusculaire*" ("twilight clause"), anticipating its closure in the event of a negative assessment;
- Strongly associate the private sector in risk-taking.

Recommendation 1. Clarify the orientation of industrial policy which underpin the direct interventions of Bpifrance and the IFPs, list them and adopt best practices.

An example will illustrate this first recommendation. In its report "20 years of capital-investment in France", Bpifrance congratulates itself that the survival rate of the companies financed by the funds it supports is very high (91% over five years). Is such a high survival rate effective for inno-

[30] Berger S. (2016): *Rapport sur les dispositifs de soutien à l'innovation en France*, January and Cour des Comptes (2015), *op. cit*.

[31] As stated in the Grandguillaume (2015) *op.cit*., report, there is some tension between the principle of joint investment *pari passu* with the private sector and the idea that Bpifrance concentrates on projects which would not arise without it.

[32] We also see that the IFP and Bpifrance are both subject to the fundamental doctrine of the joint private investment rule.

vation funds? Among entrepreneurs in the US, more than 25% of start-ups end in liquidation and the share that does not repay the total outlay is even higher;[33] a small number of brilliant successes compensate for a large majority of failures.

Without the problems linked to information, incentives and attractiveness, one could adopt the following rule: finance not only profitable projects, but also unprofitable ones as long as the ratio between expected results (updated) and unrecovered investment exceeds a certain threshold. The more the expected results are significant, the more losses are acceptable. The "prudent investor" rule is not changed here, not more than unconsidered losses.

However, in its practical application such a criterion seems fragile: the yields are only known in the long-term and the expected results are notoriously difficult to assess. Nor does it correspond to the institutional reality: the co-financing requirement is there precisely to restrain barely profitable investments. Inversely, a strict interpretation (*pari passu*) of co-financing in the life-cycle of the start-up is questionable, since one wonders about public financing's contribution in comparison with private financing.

Concerning funds of funds activity, the objective is the creation of a solid and dynamic venture capital sector in France. The issue here is to replace, temporarily if possible, absent investors and encourage the emergence of substantial professional funds to attract the "big guns" among international investors. In practice, this means jointly investing with the private sector, as does Bpifrance, but also developing, according to the changes observed in the ecosystem, a progressive withdrawal from funds which have attained the critical size, and encourage the emergence of new innovative funds, for example in new sectors. The current business volume of Bpifrance can in part be explained by the negative shock of the financial crisis affecting SMEs and start-up financing. However if the market weakness is the absence of an ecosystem, it is important to start a reduction of the means used over time, so that the private sector takes up the challenge and public support for innovating companies takes a more transversal form. Paradoxically, Bpifrance will have finally succeeded when it is no longer required except for very specific segments which cannot be financed by the private sector alone. In this regard, Bpifrance should accentuate its consolidation policy, by progressively supporting fewer funds, while enhancing the ecosystem with new innovative funds. This presupposes that financial regulation develops at the same time, enabling banks, insurers, and other financial intermediaries to take up the challenge, by using a small proportion of their balance sheets.

The difficulty is that the mere fact of its existence, playing a key role in selecting projects and coordinating private players, Bpifrance creates the risk of an eviction effect, impeding the emergence of an independent ecosystem. Its size, its recognised benchmark status and the work of prior due diligence on the funds lead private institutional investors to rely strongly on its filtration and supervision, which can prevent them from becoming independent players.[34] The investment rules imposed by law can, in the end, restrain the internationalisation of the funds invested in by Bpifrance. To encourage the development of private venture capital, it is therefore necessary to redirect the objectives of the funds of funds activity to the medium-term emergence of teams of international standing in France, and private institutional investors.

Recommendation 2. Consider the action of Bpifrance as an industrial policy aiming at the emergence of an independent venture capital industry (and not as its permanent substitute).

The key question of governance

An institution which relies on the talent and virtuous practices of its partners is, by implication, fragile. Strengthening the governance of Bpifrance and preventing its takeover by politicians is therefore crucial, particularly as the performance of Bpifrance is intrinsically difficult to assess and the costs of its policies are dispersed over a long period. This situation justifies delegation to an independent[35] agency. Currently, Bpifrance has two or three independent directors out of 15 on its various Boards (BPI France, BPI Investment, BPI Financing, etc.); this number could be substantially increased, to limit any attempt of political direction.

The IFPs, established by the CGI reporting directly to the Prime Minister, have formed a significant proportion of the funds managed by Bpifrance since 2010. In this respect they require strong coordination at the time of the definition of their overall strategy and of that of Bpifrance, to clarify both actions and to optimise the effectiveness of government intervention in innovation financing.

Taking the example of the *Agence France Trésor* (French Treasury Agency) whose strategic committee consists largely of foreign consultants, it would be interesting to appoint international experts (sector players and economists) to these governmental or advisory organs, to regularly review the investment policy in accordance with best international practice.

[33] In a joint study by Berkeley and Stanford universities on the data from ten start-up accelerators, it is shown that 92% of "TIC" start-ups fail, *cf*. *Start-up Genome Report: Premature Scaling*, v 1.2, March 2012.

[34] The same problem was referred to several times in respect of Bpifrance loans, which are often seen as a condition precedent by investors awaiting the verdict of Bpifrance as a form of certification.

[35] See Maskin E. and J. Tirole (2004): "The Politician and the Judge: Accountability in Government", *American Economic Review*, vol. 94, n° 4, pp. 1034-1054.

Recommendation 3. Provide Bpifrance with governance ensuring its independence and responsability in the long term and an enlightened view of best international practices. Coordinate Bpifrance's strategies with the CGI to optimise government intervention and its assessment.

From university research to industrial innovation

As opposed to the United States, the university system in France plays a secondary role in the emergence of start-ups. Certainly, the world success stories are not all based on cutting-edge innovations in IT or biotechnology (*cf.*, for example, Facebook, Airbnb or Uber). But while the quality of French engineers and scientific results is highly regarded abroad, France has relatively few international successes in the high-tech domain, despite its scientific prowesses.

Our enquiries reveal certain weaknesses in the process (some of which are already clearly identified in the Berger report, 2016, *op. cit*):

- *Lack of streamlining*. The accumulation of the resources of universities and public scientific and technological establishments and other public bodies (which are often partners of laboratories) implies a major loss of returns to scale. The same applies to accumulation of structures within university centres: SATT (technology transfer accelerators), IRT (technological research institutes), Carnot (a French technological institute), competitivity centres, etc.[36] Another cause of a major loss of returns to scale is geographical dispersion. One example: Commercialization, which is a SATT's competency, is a real occupation requiring international experience for deciding which patents are worth developing and at what price, whether the rule of exclusiveness for licences can be circumvented, which partners to look for, etc. It also requires specialisation; an IT engineer is hardly well-placed for negotiating a licence for a pharmaceutical patent. It is undoubtedly better to have these skills –necessarily rare and costly– at the national level, even if it means maintaining local contacts;
- *Selection of and incentives for commercialization staff.* In connection with the above, our academic research contacts pointed out the difficulty in finding the skills required for commercialization in France. They also referred to inappropriate performance figures, such as the number of patent filings, patents or start-ups created, quantitative data which is hardly relevant if most of these patents and start-ups are of no value;
- *Commercial valuation.* Too much attention is paid to the sale of patents. The profits of valuation are only one component of the equation, as the example of US universities shows. The economic benefits in terms of start-ups (in commercial value, not in number) and employment are significant.

Recommendation 4. Encourage the involvement of the scientific community in the entrepreneurial momentum in France.

This objective could be pursued by simplifying the procedures enabling researchers to exploit their inventions/innovations commercially, by implementing specific systems for exchanges between start-ups and universities (start-up work experience for science students integrated into the course, establishment of CIFRE[37]-SME theses, etc.) and in encouraging the reciprocal presence of scientists on governing bodies (Bpifrance's Board of Directors, CGI, etc.) and entrepreneurs on university governing bodies (University Boards, etc.).

Taxation as a tool of industrial policy

The impact of taxation on research and innovation is a well-established fact.[38] This is not surprising in the light of the considerable mobility both of inventors/entrepreneurs and of the capital financing them. France is naturally badly placed when taxes are concerned, but it is above all the fiscal instability and wide variety thar are really the problem, by distorting the choice of investment in favour of law performance investments[39]. This section makes no observation on the optimal level of taxation of business angels, venture capital investors or entrepreneurs. It simply states that in an extremely mobile ecosystem, significant tax differentials penalise a highly-taxed country: harmonisation of tax systems is desirable, so as not to distort the localisation of activities. As the European venture capital financial centre is London, we have deliberately chosen to compare fiscal policies between France and the United Kingdom. The prospective exit of the United Kingdom from the European Union increases the interest in this comparison.

[36] Technology transfer accelerators (SATTs) aim at federating the assessment teams of the teaching and public research establishments in a region and thereby improving the transfer of technologies from public laboratories to industrial or social applications. The technological research institutes (TRIs) associate higher eduction and research establishments, major groups and SMEs around a common technological research programme. The Carnot institutes label enhances the status of the research structures which it partners in research. Lastly, the competitivity centres associate companies of all sizes, training establishments and research laboratories in a region and a given technological or sectional field, to create an environment favourable to the emergence of innovative products, processes and services.

[37] CIFRE = industrial research training agreements for PhD students.

[38] See, for example, Akcigit U. (2016): "Taxation and the International Mobility of Inventors", *American Economic Review*, forthcoming.

[39] See Artus P., A. Bozio and C. García-Peñalosa (2013) : "Taxation of Capital Income" *Note du CAE*, no 9, September.

Taxation of institutional investors: The need for international visibility

French venture capital funds for institutional investors (professional capital investment funds, FPCIs, and free partnership companies, SLPs) are exempt from capital gains tax on exit. The French subscribers are therefore only taxable (at 15.5%) with payment of the CSG-CRDS (general social contribution/contribution to repayment of State indebtedness) and with the exceptional Fillon contribution for high incomes (3 then 4%). This puts taxation under the French "exempt" scheme virtually at the English maximum capital gains rate (20%).

French investment funds are not a common structure in Anglo-Saxon law. Indeed, taxation of FPCIs and SLPs is litttle known by foreign investors, including Anglo-Saxons, which are used to fully transparent structures. Foreign investors are therefore disorientated by this type of structure, which differs from partnerships, with which they are familiar, and they understandably question the taxation of their investments. To reassure international investors, including Anglo-Saxons, regarding taxation and in default of harmonising European or international taxation, it would be useful for the French tax authorities to issue clear instructions on the taxation of foreign tax residents investing in funds such as FPCIs or SLPs. Otherwise, the commercialisation of these funds in other European or foreign countries will continue to be difficult and expensive. It would be useful to facilitate the formalities for obtaining the EuVECA passport from the Financial Markets Authority and to simplify the procedures for subscribing to these funds (electronic signature, digitisation of legal documents, etc.).

Recommendation 5. Clarify taxation for foreign, private or institutional investors subscribing to French venture capital funds and simplify their access.

Review the taxation of entrepreneurs for creating virtuous "recycling"

A common point of acknowledged entrepreneurial ecosystems is that successful entrepreneurs or their employees contribute both financially and operationally to the creation or training of the following generation of entrepreneurs.[40] A key area in this regard, for projects and financiers, is taxation.

Two fiscal mechanisms will affect the capacity and desire of a successful entrepreneur to become a business angel for start-ups of the next generation: capital gains taxation and reinvestment in start-ups.

Capital gains on sale of marketable securities, the principal vector of remuneration

The principal remuneration for founders, directors and employees of start-ups is the capital gains realised on the sale of shares in their companies, most often on strategic acquisition or company listing.[41]

However, despite the reform voted in the PLF (French Finance Act) 2014 after the French Business Conference (*Assises de l'entrepreneuriat*),[42] French capital gains taxation on sales clearly remains less favourable than the British. Britain has further widened the gap since 6 April 2016, by reducing the rate of taxation of capital gains on securities, whose effective maximum rate is reduced from 28 to 20%[43] for general taxation. Entrepreneurs benefit from a 10% rate on the first £10 million of capital gains. France, on the other hand, has a rate decreasing from 62% in the first year's holding of the capital to 23.75% for creators of businesses having held their shares for more than 8 years. Even after 8 years' holding, the entrepreneurs will be taxed at a higher level than under the British system.

Until the sale or listing of the company, the French wealth tax (ISF) is no particular problem, since shares held by the founders are usually considered by the French tax authorities as professional assets and are therefore exempt from ISF. On the other hand, once the shares are sold, which is the normal course of the innovation cycle, the sale price is a taxable asset for ISF. For substantial capital gains, taxation can reach 75% of taxable revenue for the household of the founder, as defined for tax purposes. This appears to create a strong incentive for the successful founders to leave the country, but there is no study validating or invalidating the statistical reality of this phenomenon. A proper investigation is therefore needed into whether this causes succesful entrepreneurs to leave France and, if so, its extent and effects.

Reinvestment: Essential incentive for reinvestment in the ecosystem

Facilitating reinvestment by entrepreneurs, key employees or directors of start-ups is essential for creating a powerful network of French business angels. Apart from the share

[40] Silicon Valley is the perfect illustration of such a mechanism *via* the key roles played by major figures like Reid Hoffman, Elon Musk ou Peter Thiel, see www.bloomberg.com/features/2015-markets-most-influential/#hoffman

[41] The director of a start-up pays himself on average 2.3 times the average salary in his business; in 98% of cases, the start-up shareholders never pay themselves dividends, but in 93% of cases, the start-ups give their employees' access to the capital, *cf*. France Digitale-EY (2015): *La performance économique et sociale des* start-up *numériques en France*.

[42] France Digitale-EY (2014): *Infographie du nouveau régime des plus-values*.

[43] UK Goverment (2015): *Capital Gain Taxation & Entrepreneurs' Relief*.

portfolio (PEA), the principal existing tool for this purpose is the holding company, but it has major drawbacks:

- Costly and complex to operate (accounting and tax obligations);
- No satisfactory system concerning ISF;[44]
- Impossibility of reinvesting liquidities in venture capital funds, even those investing almost exclusively in start-ups, in respect of the obligation of reinvestment in the event of investment on sale (art. 150-0 *Bter* of the French General Tax Code).

The entrepreneur-investor account, envisaged by the government in the Finance Bill, 2017 would enable these problems to be resolved, since it would not require any administrative direction, is essentially transparent from the point of view of the ISF, as holdings would be direct and would enable reinvestment in venture capital funds dedicated to start-ups. The objective would not be to produce a tax benefit, but a traceability tool ensuring over a very long period:

- Deferred taxation on reinvestment;
- Setting off losses against profits;
- Assessing the period of investment according to the duration of successive investments and sales.

The point would therefore be to enable unrestricted reinvestment in SMEs of less than 10 years and in venture capital funds mainly investing in these SMEs. The reinvestment period would evidently be limited over time.

Recommendation 6. Ensure that entrepreneurial taxation encourages reinvestment of capital gains generated in the ecosystem.

Encourage investment by French savers in venture capital

Crowdfunding: Democratisation of access to and education of savers

Crowdfunding is significantly increasing and the sums raised from various French platforms represent nearly 300 million euros in loans, gifts and increases in capital (these amount to 50 million), have grown by about 100% over 2014.[45] The regulatory framework overally suits the current requirements for this phase of emergence. However, since the evolution of this sector has been extremely rapid and France is behind the United Kingdom, the regulations should be flexible, to assist its development while ensuring the protection of individual investors. In 2014, the British platforms raised 2.3 billion euros (ie., 79% of the European total) in loans, gifts and increases in capital (these amount to 111 million).[46]

Tax incentives: A lack of efficiency

Life insurance is the preferred French savings vehicle representing 1,600 billion euros[47] in May 2016. EuroCroissance and Vie-Génération policies, recommended in the Berger-Lefebvre[48] report, are an attempt to redirect part of these savings into venture capital, but suffer from the current low rates. It could equally be envisaged that institutional venture capital funds (FPCIs or SLPs) should be eligible for unit-linking. It would be necessary, above all, to assess the overall impact of these measures, to see whether one should go further in developing life insurance savings products to encourage the emergence of benchmark institutional private investors in the venture capital sector.

The funds (FCPIs and FIPs), subscribed with private individuals, are not only exempt from capital gains on exit, but also benefit from tax reduction on entry, either in income tax (IR) up to a limit of 12,000 euros[49] in subscription for a single person and 24,000 euros for a couple (18% reduction in IR), or in ISF (reduction of 50% of the sums paid up to a limit of 45,000 euros, or 18,000 in the event of investment *via* a fund).[50] Reductions in IR under the English Enterprise Investment Scheme[51] are 30% for one million GBP and 50% for start-up investments, for a maximum of 100,000 GBP.

FIPs were historically created for invigorating regional entrepreneurship, whereas the FCPIs were created to finance young innovative European SMEs. These two measures were criticised by the *Cour des Comptes* (2015, *op. cit.*) including for "opaque and exorbitant costs, which are, in essence, tax benefits" and "inadequate performance, mostly negative before tax benefits" or "inadequate fund size".

According to the *Cour des Comptes*, the usefulness of this tax expenditure (of 946 million euros in 2011 and estimated at 636 million in 2012) should be assessed in the light of the

[44] If a holding company is considered as a "prime mover", it is exempt from ISF as a professional asset. However, "business angel" investments will not be considered as prime movers and cannot therefore benefit from exemption. If a holding company is considered as "passive", it benefits from the exemption granted to SMEs, but the liquidities awaiting reinvestment are not exempt.

[45] Financement Participatif France (2015): *Baromètre du* crowdfunding.

[46] EY-University of Cambridge (2015): *Moving Mainstream*.

[47] FFFSA (2016): *Chiffres de la collecte en assurance-vie*, May.

[48] Berger K. and D. Lefebvre (2013): *Dynamiser l'épargne financière des ménages pour financer l'investissement et la compétitivité*, Report to the French Prime Minister.

[49] http://bofip.impots.gouv.fr/bofip/4374-PGP

[50] The portion of the payment made for subscribing to shares in FCPIs or FIPs granted a reduction in ISF cannot benefit from income tax reduction.

[51] UK Goverment (2013): *Enterprise Investment Scheme & Seed EIS*.

criticisms regarding the true efficiency of these measures and that of the other support mechanisms in the innovation financing sector and the regional funds (Bpifrance direct funds, FNA funds, the programme for financing of French Tech accelerators, etc.). In comparison, the cost of the incentive scheme for capital gains on sales, introduced in 2014 after the French business conference and encouraging investment in SMEs of less than 10 years is assessed at between 15 and 60 million euros.[52]

These expenses should therefore be incorporated into the overall balance sheet of government intervention, to decide whether they constitute the best allocation of the public effort, deserving to be retained, or whether the improvement of other mechanisms would be more effective.

Recommendation 7. Assess the effectiveness of all public policies concerning both fiscal and industrial venture capital *via* the action of Bpifrance and the IFPs, to find the best way of using the budgetary effort granted for the creation of an independent entrepreneurial ecosystem.

Public support for the creation of start-ups is justified by the wish to develop in France a critical mass of investment funds at an international level and by externalities generated by company creation. This support, which is largely effected by tax incentives and the action of Bpifrance, should be optimised. The challenge is considerable: France can construct a benchmark European ecosystem for venture capital in Paris, especially at a period of instability for the London market.

[52] *Évaluation des voies et moyens*, tome II 'Dépenses fiscales', Annexe au PLF pour 2015.

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