European Commission

Reflections on a Revision of the Definition of the EU SME

Crehan, Patrick

December 2020

Joint Research Centre

Contact information
Name: James P. Gavigan
Address: European Commission, Joint Research Centre, Edificio Expo, Calle Inca Garcilaso, 3, 41092 Seville, Spain
Email: james.gavigan@ec.europa.eu
Tel.: +34 9544 88409

EU Science Hub
https://ec.europa.eu/jrc

JRC123296

PDF ISBN 978-92-76-28301-0 doi:10.2760/602855

Luxembourg: Publications Office of the European Union, 2020

How to cite this report: Crehan, P., *Reflections on a Revision of the Definition of the EU SME*, Gavigan J. editor, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-28301-0, doi:10.2760/602855, JRC123296.

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Foreword

This paper has been prepared on the request of the European Commission's Joint Research Centre (JRC) Unit for Finance, Innovation and Growth (B7). It constitutes a contribution to a long-running debate on the ownership criterion in the 2003 European Commission SME definition as applied to venture capitalist investment in firms. The specific aim of the paper is to provide a compilation of examples, evidence and praxis from around the world which inform the discussion on whether or not there are grounds for changing this ownership criterion part of the SME definition. The paper brings together an overview of actual experiences of firms and venture capitalists on the ground in relation to VC investment decisions and the respective roles of the different parties involved in such deals. This draws mainly on publicly available professional literature on the subject but also on academic and grey literature. The paper also takes stock of a variety of SME definitions employed by public authorities and government agencies in the US and elsewhere for the purpose of illustrating ways in which the specificities of definitions can be customised in light of certain public policy objectives or concerns. The result is an eclectic mix of thought-provoking up-to-date insights which are worth bringing to bear on the current debate and on however this debate may continue to unfold in the future.

Acknowledgements

The paper has been prepared with the support of the European Commission's Joint Research Centre – Knowledge for Finance, Innovation and Growth Unit (JRC.B.7) in the context of its work to provide policy-orientated evidence and analysis of high-growth enterprises, venture capital trends and of conditions favouring the emergence of innovative high-potential firms. I am grateful to James Gavigan for inviting me to prepare this paper and for feedback from him and other members of the High Growth Enterprises team in JRC.B7 (Giuseppina Testa, Mario Janiri, Florian Flachenecker) as well as from Michalea Nardo and her team in JRC.B1 during its preparation.

Authors

Patrick Crehan

Abstract

The European Commission provides a definition of the SME intended to create a level playing field across Europe for businesses applying for grants or other assistance intended only for SMEs. This definition has been in force since January 1, 2005. Without going into too much technical detail, the definition consists of the following three rules, namely that the

- The company has less than 250 employees,
- That either its turnover is less than €50M or its balance sheet is less than €43M,
- That these numbers are computed based on weighted totals from the company and related entities, depending on whether the company is considered to be "autonomous," "partnered" or "linked."

This definition was challenged by the EVCA in 2009 and by Business Europe 2017. Both made the point that the definition as it stands is unfair to VC-backed enterprise on the basis that some VC-backed start-ups risked exclusion from SME support programs because the SME definition would consider them "linked to" or "partnered with" giant financial actors, unfairly inflating their size and pushing them beyond the threshold of eligibility for SME programs.

Access to SME programs by VC backed enterprise is not the only issue at stake for a possible revision of the definition of the SME. It is possible that other issues may arise in the aftermath of the pandemic, and as an unintended consequence of efforts to support business and employment in the coming years. So, now is a good time to look into this in more detail to see if there is a need to revise the definition of the SME in Europe, or if it is advisable to create exceptions for the treatment of VC-backed enterprise in order to avoid their unfair treatment or exclusion from important sources of SME support.

In its letter of 2009, the EVCA referred to the case of Italy, suggesting that this would provide a better model for the case of VC-backed enterprise. Although the letter did not go further in specifying what was good about the Italian definition, this provide an interesting place to start to explore the scope for a possible revision.

The Italian definition, still in use today, considers a business to be medium sized if its turnover is less than €355M and if it employs less than 500 people. This is very different from that employed by the EU and begs the question as to how one might decide the…

- Criteria to use, how many and in what combination
- Thresholds that mark the boundary between small, medium, and large enterprise
- Related entities to be considered a part of the company in order to determine its "true" size

A search of the literature reveals that there are at least 50 different definitions of small business in application around the world. Although the literature is not extensive, it does refer to the principles at work, the criteria applied, various debates about the relevance of different criteria as well as the role of models for SME growth in all of these debates. One of the most important criteria is "industry policy."

The most comprehensive information was obtained in the case of the US. This was pieced together mainly from a careful reading of documents available on or referred to from the website of the Small Business Administration (SBA). In this was it was possible to put together a comprehensive picture of how small business size standards are determined in the US, their origin in government procurement programs going back to the 1920s and their evolution up until today. The original motivation for small business size standards in the US was a need to rationalize programs for small set-aside, that reserved up to 23% of all federal procurement for the small business sector. They are revised once a decade and size standards revised in 2009 were updated once again in 2019. The size standards for small business set-aside vary from sector to sector and are adjusted between major revision based on indexes such as the rate of inflation or worker productivity.

In the 2019 revision…

- Size standards for 532 sectors are based only on the number of employees. The upper limits ranging from 100 to 1,500 depending on the sector.
- Size standards for 505 sectors are based on turnover alone. The upper limits for these ranging from $1M to $41.5M depending on the sector.

- A small number of sectors have size standards based on their total assets, with the upper limit being $600M.

The main criteria applied for access to the SBIR small business research and innovation programs, intended to encourage the participation of small business in federally funded research programs is that they employ no more than 500 people.

It is interesting to note that the US federal government provides a "right of rebuttal" to companies that feel they have been wrongly excluded from small business programs. The rules relating to autonomy, ownership and control are quite different from those employed in the EU, but no less complex or difficult to apply.

The issue of access to small business programs by VC- or PE-backed enterprise has also been a subject of debate. It has been a subject of great controversy in the context of the PPP program intended to help business affected by the pandemic. Since 2012, federal agencies have been given the possibility to extend the definition of small business to companies that are majority owned by VC or PE funds, on the basis of the so called "section 5107 authority." The choice has been left up to the individual agencies to decide if they will adopt this new rule or not. Not all have done so. Many are unsure if it is necessary or right. Nevertheless, this facility has been evaluated and so far, there has been no adverse impact on research or competition, and it looks set to continue in future. There was no complex arithmetic behind the legislation. It was based simply on a belief that it would encourage innovative science based small business to seek support from the VC- or PE-sector, without fear of being excluded from sources of research funding reserved for small business.

The most recent evolution on this front, has been the granting access by VC- and PE-backed enterprise to the Pay-check Protection Program (PPP), at least a part of which was managed by the SBA. Recently released data has been examined by industry analysts and journalists. Key observations include…

- Almost 10,000 VC- and PE-backed companies (9,657) received PPP loan support
- They received $14.3B of the approximately $500B distributed
- 4,800 PE- and VC-backed recipients had raised funding rounds in 2018 to 2020
- 2,267 of those raised funding in 2019
- 3 of the top 5 investors whose portfolio companies applied for help were start-up accelerators such as Techstars and Y Combinator

To conclude:

- The idea of a single definition for all of the EU and for all policy purposes, though understandable, may be too ambitious and risks depriving fast growing small business in Europe from resources which may help them succeed, especially in the context of dramatic shocks to both business and consumers due to the pandemic.
- In particular the rules for ownership and control are too complex and should be revised. Perhaps with a view to carving out exceptions to the general rule, for cases where it is clearly in the public interest. This requires a clear understanding of what public interest is at stake in this case.
- There is considerable variation in the way small business is identified around the world, in terms of the criteria used, in terms of the thresholds applied and in terms of what other entities to include in order to determine the "true" size of the enterprise.
- It may be useful to go back to basics and argue ab-initio as to what the definition should be, in order to achieve explicit policy goals, and to avoid unintended consequences which are clearly identified in advance and against which proposed definitions can be tested.

With a view to clarifying issues of public interest, these are referred to in the main text and further elaborated upon in a series of annexes intended to clarify the role of VC in the growth of small business, the difference between VC and PE, the complex web of relationships that characterize the LP-GP-PC universe, the challenges they face now and those they may face in the future.

1 The Case for Revising the Definition of the SME in Europe

1.1 The EU Definition

The current definition of the SME employed by the European Commission is contained in a Commission recommendation dated May 20, 2003[1]. It came into force on January 1, 2005. Some aspects of the definition are quite complex notably the rules that determine if a business is a "genuine" SME. In 2016 the European Commission published a user guide to the definition[2], among other things intended to clarify the concept of a genuine SME, justify the method used to determine if this is the case and provide a template for a company's declaration of eligibility.

The guide underlines the importance of SMEs in the EU economy, reminding the reader of the general wisdom that "9 out of every 10 enterprises is an SME and that SMEs generate 2 out of every 3 jobs." It cites Jean-Claude Junker, then President of the European Commission, saying that "SMEs are the backbone of the economy, creating more than 85% of new jobs in Europe, and we have to free them from burdensome legislation."

The text also points out that "in today's complex business environment they may have close financial, operational or governance relationships with other enterprises. These relationships often make it difficult to precisely draw the line between an SME and a larger enterprise. The SME Definition is a practical tool designed to help SMEs identify themselves so that they can receive the full support of the EU and its Member States."

This expresses a legitimate concern that "support measures are granted only to those enterprises that genuinely need them… if an enterprise has access to significant additional resources it might not be eligible for SME status." In particular it points to cases where it has access to significant additional resources … "because it is owned by, linked to or partnered with a larger enterprise."

In referring to a need to avoid competitive distortion in a single market with no internal frontiers and in an increasingly globalized business environment, it is essential that measures in support of SMEs are based on a common definition. It points out that the "lack of a common definition could lead to the uneven application of policies and thus distort competition across Member States. An enterprise in one Member State, for example, might be eligible for aid, while an enterprise in another Member State of exactly the same size and structure might not be eligible. A common definition helps to improve the consistency and effectiveness of SME."

The guide points out that whereas the use of the EC definition is "voluntary for member states … the Commission invites them, together with the European Investment Bank (EIB) and the European Investment Fund (EIF), to apply it as widely as possible."

Although these assertions appear reasonable at first sight, they are at odds with findings by researchers who have studied variations in the definition of SMEs across the world, and note that the definition varies greatly, and that this variation is motivated by a range of issues such as the local state of development, the economic challenges that a region might face and the specific challenges that a company in a given sector might face. The findings of these researchers are consistent with the need for regionally differentiated development policies across Europe, with the practices of member states such as the annual survey of medium sized enterprise carried out in Italy, as well as with international practices such as those employed by the US Small Business Association.

Arguably the situation is far more complex than appears at first sight and it could be fruitful to review arguments provided by the European Commission, in relation to the motivation for a single definition, the policy goal that the definition is intended to support, as well as the criteria and thresholds (size standards) employed to draw the line between businesses that qualify as SMEs and those that do not.

The European Commission requires an SME to simultaneously satisfy constraints in relation to the number of people it employs (it must employ less than 250 people), and monetary or financial constraints based either on the company's turnover (which must be less than €50M) or its balance sheet total (which must be less than €43M).

There is room for debate with regard to both of these criteria, but this will be discussed elsewhere. For now, the paper will focus on the idea that the SME must be a genuine SME, that it is not some other kind of structure, perhaps even unwittingly masquerading as an SME, applying for assistance for which it does not really qualify.

For the purposes of deciding if a company is a "genuine" SME, the Commission therefore classifies a company as being of 3 kinds. Namely "autonomous," a "partner company" or a "linked company."

It is tempting to ask why these terms are used instead of terms which are well-known and understood by accountants, terms such as "independence," "subsidiary," "affiliate," or "associate" company. The point has already been raised by Business Europe.

That aside, these distinctions are intended to help determine if an enterprise really is autonomous and able to act independently on its own behalf, or if it is effectively controlled by some other entity. These distinctions are also intended to determine if the enterprise has access to resources beyond those which it directly controls, perhaps the resources of a controlling company or of a company over which it has control.

The guide provides definitions of the three cases of an enterprise which is autonomous, a "partner" or "linked." Each of the three cases refers to the enterprise being involved with other companies either on the basis of ownership (shares) or control (voting rights or other forms of control). The definitions of the three categories include references to thresholds (25% and 50%), and for the use of thresholds of either of ownership or control on the basis of "whichever is higher."

The process of determining the eligibility of an enterprise, starts by listing those entities with which the enterprise is a partners and those entities with which it is linked, and then computes the employment and financial criteria based on a weighted sum of those figures where the weight is 100% for the enterprise itself and for all of its linked companies, added to those numbers for the partners companies where each is weighted by the % of shares or voting rights held (whichever is higher).

In doing all of this a number of exceptions apply. For cases where either venture capital funds, institutional investors, universities, or small autonomous local authorities can be considered "partners" that is holding up to 50% either of the capital or the voting rights of the company (whichever is higher) they can be ignored and their weighting is effectively zero.

The application of such rules are easy in the case of an autonomous enterprise, but quickly overwhelm most people for any more complex arrangement, especially when the enterprise is both a partner company and a linked company. Business Europe has highlighted cases where in this case, both the European Commission and one of its agencies failed to correctly apply its own rules and unfairly denied reduced fees to at least two companies courageous enough to bring the matter to court. In a separate matter the EVCA (European Venture Capital Association, now called Europe Invest) expressed reservations about the impact this definition might have on their portfolio companies, in particular their access to funding by SME oriented research and innovation programs.

Issues of clarity, complexity, and ease of application aside, there are a number of issues with the definition and its application, which are worthy of debate. To understand these issues, it is useful to "stress test" the defining based on number of concrete cases and see if the definition is treating these cases fairly or not.

1.2 The EVCA Challenge

In February 2009, the EVCA commented on Commission recommendations 2003/361/EC concerning the definition of "micro, small or medium-sized enterprises." It claimed that EC recommendations may unfairly block access by venture backed companies to SME EC funded programs.

Their main points concern the impact of criteria relating to the ownership and control of companies which nuance the basic eligibility criteria based on the number of employees, turnover and balance sheet total.

The implication of these criteria is that companies that otherwise comply on the basis ostensibly of the number of employees, turnover and balance sheet total, may be ineligible on the basis that they are not independent and act under the control of partners or linked companies.

The EVCA letter points out that the EC definition includes a list of exceptions to these independence rules, which allow some companies to retain their eligible status. It asks the EC to clarify that the portfolio companies of PE and VC funds are not (unfairly) excluded on the basis of partnership and linked-company criteria, even in the case where they are majority owned by a fund.

It considers that that not doing so may have an impact on VC portfolio company's by putting them at a competitive disadvantage with respect to non-VC backed companies. It claims that this may have an impact on the VC industry by discouraging SMEs from recourse to VC funding.

1.3 The Business Europe Challenge

In a position paper published in November 2017[3], Business Europe pointed to difficulties in the lack of clarity of the 2003 definition of SME that led to companies being unjustly denied advantages accorded to SMEs. The position of Business Europe was repeated in a letter dated April 2018[4]. In the second instance it gave increased weight to a recommendation that the definition be interpreted in a way that prevents companies which would otherwise qualify as SMEs, from being denied access to state aid on the basis that they are majority owned by a venture capital fund.

The assertion that a company is "majority owned by a venture capital fund" is much more complex than at first sight. It is explored in more detail later on.

The criticism of the EU definition was based on the rulings of two general court decisions, namely the cases T-675/2013 and T-587/14 in which K-Chimica and Crosfield were denied their right to reduced registration fees by ECHA, the European Chemicals Agency in charge of implementing the REACH regulation, on the basis that they failed the test of eligibility, being part of a network of "partner" and "linked" companies.

The court ruled that in both cases, neither ECHA nor the European Commission correctly interpreted the definition. It provided a clarification on how to interpret the definition when a small business is part of a network of companies that include companies that qualify as "partner" companies and as "linked" companies.

In its letter of 2018, Business Europe makes a number of suggestions for improvements.

- It called for greater clarity in the presentation of the rules saying that "the 2003 SME definition is not up to standards regarding clarity of the wording … in particular when it describes the methodology to be applied to assess if an enterprise can have the SME status." The letter referred to rules that exist in international accounting standards, which indicate when a company should provide consolidated accounts, which are relatively clear and well understood, as a way to improve the situation.
- It asked that consideration be given to linking the financial criteria for eligibility to the rate of inflation[1].
- It held as "erroneous" the view that "when an SME is financed by a venture capital fund taking a majority participation in it, it becomes part of a larger group and is integrated in a common group strategy." It suggests that a solution may lie in amending Article 3 of the EU SME definition in such a way that an SME is also deemed to be autonomous even in cases where a venture capital fund holds 50% or more of the capital or voting rights of the company.

In view of these challenges, it makes sense to examine how small business is defined in other parts of the world. In particular to examine

- How the boundary is drawn between the business and its environment,
- How issues of autonomy ownership and control are handled
- How the special case of VC-backed industry is dealt with.

1.4 A Need for Clarity

Whether or not the European Commission decides it is time to revise the definition of the SME in Europe, the challenges referred to above suggests a need to clarify the rules that apply and how to apply them, especially in the case of the rule related to autonomy, ownership and control.

With this in mind, I provide a short annex entitled "Annex 1: Ambiguous Language" where I gather together my own views on some of the difficulties that may arise due to the use of language and concepts which may be considered either ambiguous or sufficiently new and unfamiliar as to require clarification.

It would help considerably to clarify the reason for these rules. At first sight they seem reasonable, but they hide a lot of complexity and scope for misunderstanding. A discussion on a revision of the rules would benefit from going back to basics and examining the issues that are being addressed by any specific formulation of a definition of the SME or rules governing the conditions under which a company is eligible for SME funding. A careful elaboration of these issues would allow the designers of the rules and the stakeholders they consult, to stress-test proposals against cases for which they think exception should be made, evaluate their fitness

[1] A practice that is standard in the US

for purpose and suggest improvements. With this in mind, I have provided an annex entitled "Annex 13: The Problem of Big Companies Pretending to be Small" with a view to opening up a discussion on "problems" that the complex rules of autonomy, ownership and control are intended to avoid.

It is worth pointing out that companies in receipt of funding from European Programs such as H2020, are subject to a great number of controls intended to check that the grant money they receive is indeed being used for the purpose claimed in the grant agreement. The use of this money is evaluated by external experts. Grantees conclude detailed contracts with the European Commission or its agencies, where the use of budget is carefully defined. The grant money is released in tranches as the project progresses on the basis of successful project reviews. The progress of the projects is monitored by experts who are external to grantees and to the agencies that manage the funding. The grantees may then be audited as a further check on the validity of their claimed costs, during a certain period after the end of the project. If the reason for restricting access to SME funding for VC backed small businesses, is a fear that their backers (LPs and GPs) might siphon off the funds and use them for other purposes, the controls already put in place by EU funding programs already provide a high degree of protection against this risk. Which begs the question of what exactly the current rules are intended to avoid.

I am of the view that the case of VC-or PE-backed enterprise requires special treatment. Both PE and VC are generally organized as limited partnerships on the basis of a GP-LP structure. As a general rule a VC or PE fund is not even a legal person, but a structure based on a set of temporary agreements between the partners. The LP-GP relationship and these agreements erect high barriers in terms of how each relates to the other and how each related to the portfolio companies (PCs). I provide a number of annexes intended to clarify these issues. Notably…

- Annex 2: Legal Persons, Natural Persons and Partnerships
- Annex 3: Stress Testing the EU definition of the SME

The relationship between the GP and LPs and between these and their portfolio companies is very different from those with which accountants or students of business administration are most familiar, relationships based on associates and affiliates involving parent-, daughter- and sister- companies. And so, they deserve careful consideration, separate from that given to other common structures.

For these reasons, I have provided a number of annexes intended to clarify those differences and explain why the LP-GP-PC universe deserves closer scrutiny than it has received in the past. These include

- Annex 4: The LP-GP Relationship
- Annex 5: The VC-PC Relationship

All kinds of tensions exist in these relationships. These are described in the annexes listed above. On the issue of control, there can be no doubt of the need for VCs to exercise control over their PCs. Such control is exercised directly by the GP, and as explained in an annex entitled "Annex 12: Trying to Imagine a post-COVID World," it is highly likely that the exercise of control by GPs over PCs will only increase as a result of the pandemic. On the other hand, the LPs do not exercise control over the PCs. This is fundamental to the limited partnership structure of the fund and is intended to protect the LPs from litigation by PCs. The possibility of such litigation is real but is directed in general towards the GP and not towards any of the LPs.

Despite the clear need for a VC fund to exercise control over the PCs, I do not think this is grounds for excluding VC-backed enterprise from accessing support intended for small business, by counting the assets of LPs (and GPs) as resources to which the PC somehow has access. The VC-PC relationship is more like that of a bank to a mortgage holder, where property being held as collateral takes the place of equity. Banks exercise high levels of control over the companies they lend to, yet companies are not denied access to SME funding on the basis of their having a bank loan. So why the animus towards VC backed small businesses? The point requires clarification, and it is possible that mistrust aimed at the VC-backed enterprise, arises because of a confusion between the world of PE and that of VC. For this reason, I have provided a series of annexes intended to clarify how different the approach of PE is different from that of VC. PE looks for a majority stake in its PCs, taking 100% ownership if possible, and with a view to extracting as much revenues as it can from its PCs in order to maximize its own profits and returns to the clients whose money it invests. PE usually has a negative effect on the ability of a company to invest in the future, for example via research and innovation. On the other hand, VC takes a minority stake in its PCs, works closely with them to maximize their exit potential, and has a positive impact on their propensity to invest in research and innovation. The general trend has been for VC to side with the founders and VC has been highly innovative and resourceful in finding ways to better serve start-ups and their founders based on innovative models for start-up growth, the development

of founder teams, innovative models for start-up and early stage financing as well as innovative new exit strategies. All of this is explained in the following annexes I have provided:

- Annex 6: The difference between VC and PE
- Annex 7: The Impact of VC ownership on Research, Innovation and SME Growth
- Annex 8: Innovation in VC Financing Models and Exit Strategies

A final decision on whether or not to revise the definition of the SME in Europe, will normally rely on a consideration of the public good that this will serve. On that basis it is useful to recall why SMEs are important and to provide context for the role of VC in economic development. It is also useful to try to anticipate what may have changed since the pandemic, how the needs of start-ups and the challenges they face may have changed and how priorities for their support may evolve in the coming years. For that reason, I have provided the following series of annexes:

- Annex 9: The Social and Economic Role of Startups and SMEs
- Annex 10: Financing Start-Up and SME Growth
- Annex 11: The Complexity of Startup Finance Trajectories
- Annex 12: Tying to Imagine a post-COVID world

This section has focused primarily on issues related to ownership and control, as well as on the special case of VC-backed enterprise. A revised definition of the SME in Europe must apply to a much larger group of businesses, than those that are VC-backed. Or perhaps the category of VC backed business requires special treatment. I will come back to these issues, but for now I return to the issue of small business size standards, to look mainly at the numerical criteria that apply and how these are determined in different parts of the world.

2 Other Approaches to Small Business Size Standards

The letter of the EVCA referred to above, points to the Italian treatment of SMEs and suggests that this might provide a better approach than that suggested by the EU. The letter did not specify what the EVCA liked about this definition, so we need to look into this a little further. Doing so provides a good place to start to explore the variety of approaches that exist around the world, in search of insights as to how the EU definition might be modified, on what basis, and how.

2.1 The Definition of Medium Sized Business in Italy

Since 1996, Mediobanca and Unioncamere carry out an annual survey of medium-sized enterprises in Italy. From 2000 to 2002 the group was assisted by CREA at the University of Bocconi in Milan. Since 2003 other universities have been involved. The February 2019 survey is the most recent one.

This study includes

- A database of financial aggregates compiled from balance-sheet data, broken down by region and sector, and including the main indicators.
- Comments on the trends in Balance Sheet / Profit and Loss data.
- Additional papers by academics with particular expertise in a given area.

It applies a definition of medium sized enterprise that is significantly different from that used by the EC. In particular a medium sized enterprise…

- Is incorporated as a company in Italy
- Is not controlled by a larger or a non-Italian firm
- Has an annual turnover of between €16M and €355M
- Has between 50 and 499 employees

The upper limit of €355M is surprisingly high when compared to that employed in the EC definition. Although it is not clear how the Italian government arrived at the upper bound of €355M in turnover and 499 in number of employees, it is clear that the definition is associated with well-defined policy goals, in particular with a view to understanding and supporting the needs of a group of companies often referred to in Italy as "pocket multi-nationals." These are companies of intermediate size, which though local in nature, have strong export capabilities. The thinking behind this is provided by an Italian economist called Giuseppe Turani[5] who in the 1990s wrote about this group of companies and referred to them as the "Fourth Capitalism."

Beyond these references, it is not clear from the available literature, what exact methods were employed to arrive at these thresholds. The reference to criteria of "control" in the above definition is also ambiguous. Due to its complexity I will come back to this in a later section of this paper.

2.2 The 50+ Definitions of Small Business Used Around the World

Berisha and Shiroka Pula[6] provide an overview of different approaches to the definition of SME and the questions that these different approaches raise. They compare definitions used by institutions such as the EC (2005) and the World Bank (2008), which differ on both criteria relating to the number of employees and monetary criteria.

They provides a comparison of definitions or at least that part of the definition that is based on the number of employees. Their analysis covers a range of countries or regions that includes the EU, Turkey, USA, Canada, and New Zealand. The cut-off that separates SMEs from large companies ranges from 100 in the case of new Zealand to 200 in the case of New Zealand and South Korea It is 250 for the EU and Japan and 500 for the case of Canada and the US. It is useful to acknowledge the range of definitions that are currently being used, even if this hides further layers of complexity which I explore in more detail later on.

Berisha and Shiroka Pula also refer to a 1992 study by Pobobsky[7] in which he cites work by the ILO which identifies over 50 definitions of an SME used in 75 countries. Pobobsky notes that there is considerable ambiguity in the terminology used to articulate those definitions.

Berisha and Shiroka Pula refer to issues concerning the use of the number of employees as a criterion, raised by Curran and Blackburn[8] based on the changing nature of the work force. They refer to issues related to the

use of financial criteria. There is considerable variation in the choice of criterion as well as in the numerical threshold applied to the same criterion in different countries. The authors point out for example that one of the biggest challenges for small businesses are financial, in that that they tend to be credit poor, cash constrained and/or under-capitalized. What small businesses "feel" is cash-flow and they consider that the use of criteria such as "turnover" can easily mislead as a criterion for company size or be distorted by taxation.

Riaz and Aziz (2015) also review the literature on the size of thresholds used in SME definitions[9]. They refer to the great variety of definitions in use across the world. In particular they refer to a database of definitions being developed by the World Bank and work based on this database by Ayyagari, Beck and Demirguc-Kunt[10], as well as by Kozak[11] and Khrystyna[12]. They quote Gibson and Vaart (2008)[13] on the relation between size thresholds and state of development. They identify and list the criteria which seem to apply in the design of size thresholds used, namely:

- Population size (country population)
- Economic challenges,
- State of development
- Level of economic internationalization
- Nature of the industry
- Strength of each business and industry
- Industrial policy objectives
- Government and non-governmental support programs

In the case of the EU definition it is interesting to ask how these factors have been integrated into the process of defining the SME in Europe, how the idea of a single definition emerged as part of the solution for the development of business in the EU. For now in any case, I have no detailed insights on this question.

Although it is clear from the literature that there is great variation in the definition of the SME, in particular variation in the choice of size standards, there are nevertheless gaps in the literature. Beyond the listing of criteria that are used to determine size thresh holds, very little is said about the methods used to determine those thresholds.

I suspect that for many countries the "methods" are pragmatic, in the sense that public administration looks at what is done elsewhere, and then consults with local experts, relying on their judgement in order to adjust for local conditions.

The only clear account that I have found, of methods applied to determine size thresholds for small business is that provided in a series of white papers and consultation documents by the Small Business Administration in the US.

2.3 The Many Definitions of Small Business Employed in the USA

The main actor dealing with small business development in the USA is the Small Business Administration or SBA[14]. Its main instruments include

- A small business loan guarantee program
- A "set aside" program that enables small business to take part in public procurement
- Grants for research and innovation[15] based on programs such as
  - SBIR, the Small Business Innovation and Research program[16]
  - STTR, the Small Business Technology Transfer program[17]
  - FAST, the Federal And State technology partnership program[18]
- A small business disaster relief program that most recently includes the PPP or Pay-check Protection Program, intended to help small businesses maintain payroll despite the impact of COVID-19 on their business.

Access to these programs involves meeting eligibility criteria[19]. It is interesting to note that the criteria for eligibility applied in the US are broader and more flexible that those applied in the EU.

This is of relevance to any discussion about a possible revision of the SME definition for the EU because any proposal to modify the current definition, may have to demonstrate that it does not constitute an illegal form of state aid. The US definition provides a benchmark against which this can be judged. It also provides insights into how "eligibility" is defined, the principles on which such definitions are based, the reasoning behind eventual criteria which are employed by specific programs, and the reasoning behind any decision to allow "exceptions" in the case of VC or PE backed small enterprise.

2.3.1 The History of Size Standards in Small Business Set-Aside

US government assistance to small business has a long history. It has its origins in a program of "small business set-aside," that has evolved over the years from a program intended to meet the government need to secure supplies of essential goods in war-time, into a program that supports the growth of new business as a creator of jobs, a source of innovation and a source of competitive pressure that should reduce the general cost of procurement.

Since the very beginning, such programs have been opposed by large business, who feel that they deprive them of access to markets and profits to which they consider they have a right. They have been creative in finding ways to work around the rules and win back what they see as business lost to "up-starts" (as opposed to "start-ups"). Their strategies include simple collusion with small businesses, to buying up small businesses that have won set-aside contracts, to simply ignoring the rules by exploiting mechanisms for self-certification and pretending to be smaller than they really are.

This story, which starts back in the late 1920s, continues up until the present day, and has led to suspicion if not outright paranoia on the part of the public sector, concerning the efforts of big business to bend the rules and find ways around programs that are primarily intended for small business.

This history is explored in greater detail in an annex to this paper entitled "Annex 14: Further Notes on the SBA, Size Standards and COVID-19."

The application of size criteria appears simple at first sight. Nevertheless, there are subtilties in deciding where the "boundary" of a company lies, and concern that some companies might pretend to be small, whereas they are in fact very large and powerful and use the pretence of smallness to benefit from programs that are in fact meant for others, the "genuine" small businesses.

I will come to this issues several times in what follows. But in order to establish a basis for understanding this issue, I include an annex entitled "Annex 13: The Problem of Big Companies Pretending to be Small." Among other things It refers to the use of shell companies to disguise illicit activities. This happens and recently the FBI has expressed concern about the use of PE and hedge funds for the laundering of money. This includes cases where innovative crypto-currency activities have been used to hide illegal activity. The issue is worth knowing about as it has been used (unsuccessfully) as an argument in the US, to block access to SBA funding for VC backed small businesses.

2.3.2 Size Standards for Small Business Set-Aside by Sector and Over Time

The SBA has authority to establish business size standards for US industry[20]. As explained above, an important motivation for this is to determine what companies will have access to federal contracts reserved for small business, based on a series of small business set-aside programs.

Existing standards are the subject of a major review every 10 years. The process starts with the publication of a methodology paper which is put out for consultation, before being finalized and implemented. In this way a size standards methodology was adopted in 2009[21] and updated in 2019[22]. The current table of effective size standards is dated August 2019. It assigns thresholds for eligibility for small business programs based on their NAICS code. Some are based on number of people employed, others are based on average annual receipts. None are based on a combination of the two.

The monetary thresholds vary from $1M in annual receipts for businesses such as soya bean farming (NAICS 111 110), to $41.5M for businesses such as industrial launderers (NAICS 812 332).

The employment thresholds vary from 100 for fuel dealers (NAICS 454 310) to 1,500 for makers of aircraft, aircraft engines and aircraft engine parts (NIACS 541 715).

2.3.3 The 2019 Revision and Methods Used

The 2019 white paper on the methodology to be used, is instructive in that it gives an overview of the legislative history relating to small business and relate size standards. It notes that "no single definition may be expected to meet all requirements" and that a small business concern should be defined "in a flexible and realistic manner… because it has become universally recognized that it is utterly impossible to define small business rigidly in terms of number of employees, amount of capitalization, or dollar volume of business."

Until 1957 the main criterion for designating "small business" for the purpose of awarding federal government contracts, was the simple "500 employee" rule.

The SBA adopted the rule of "500 emp1oyees" as the threshold for a small manufacturing business since its inception in 1953. This remains a standard for many purposes even today. Nevertheless, even by 1953, it had already been observed that "95.2% of businesses employed less than 20 people" and that there was good reason to consider a modification of the rule. In 1959, SBA regulations distinguished between manufacturing and financial industries. Although it maintained the "500 employee" rule for federal contracting programs, it started to introduce size standards based on thresholds of 250, 500 and 1,000 employees for financial assistance programs. The SBA experimented quite a lot with size standards throughout the 60s, 70s, 80s and 90s, a story that is told in some detail in the SBA white papers of 2009 and 2019.

In March 2004, when the SBA proposed using industry specific criteria based only on the number of employees, their proposal had a mixed reception and was withdrawn. Feedback suggested that for many industries, the use of receipts would be more appropriate. In a number of sectors where the principle of using the number of employees as the sole criterium for a size standard, the standards in force were considered no longer appropriate for that sector. By 2009 the size standards were based on either the number of employees or on average annual receipts for the company.

The white paper of 2019 (and other white papers before it) takes account of a need to accommodate "variation by industry and consideration of other factors." In particular it requires that "when establishing or approving any size standard … the Administrator shall ensure that the size standard varies from industry to industry to the extent necessary to reflect the differing characteristics of the various industries and consider other factors deemed to be relevant by the Administrator."

Ultimately the text gives "the Administrator the flexibility to establish size standards using a broad range of criteria, depending on what the Administrator determines will serve the interests of small businesses the best."

In doing so the Administrator is required to provide for each standard:

- A detailed description of the industry for which the new size standard is proposed
- An analysis of the competitive environment for that industry
- The approach the Administrator used to develop the proposed standard… and
- The anticipated effect of the proposed rulemaking on the industry.

The analysis is guided by a number of assumptions, one being that the size standard should be based on considerations of the number of employees or on some financial consideration, but not on a mixture of both. The white paper contains a table which assigns a size criterion to each sector based on a set of "industry factors."

To arrive at a decision on size standards, the SBA applies a combination of what it calls primary factors, secondary factors, and stakeholder feedback (public comments).

The primary factors are:

- Industry structure
  - Average firm size (measured by receipts or number of employees)
  - Average assets size
  - Industry concentration
  - Distribution of firm size
- Small business share of market for federal contracts market

The secondary factors are

- Technological change
- Competing or similar products
- Industry growth trends
- Unique history of the sector
- Impacts on SBA and other programs

The white paper provides an extensive discussion on issues such as sources of data, statistical techniques, the impact of changes in methodology, the impact of changes in NAICS codes etc.

The 2019 revision of size criteria thereby assigns

- A headcount criterion to 505 sectors, where the threshold ranges from 100 to 1,500 employees.
- A financial criterion to 532 sectors, where the threshold based on average annual receipts ranges from $1M to $41.5M, and where for some sectors the threshold is based on the company having less than $600M in assets.

In the 2019 revision of size standards, the SBA increased the thresholds for 621 out of a total of 1,009 standards. It decreased three so as to exclude potentially dominant firms from being considered small. It retained 388 at their existing levels. Of those that were retained, 214 were retained based on the results of the technical analysis as described in the white paper on methodology. 174 were retained based on a policy decision not to lower the size standards for certain sectors in light of the economic environment, even though the technical analysis might have supported lowering them.

It is clear from this that the variation in size standards is quite significant. It is also important to bear in mind that the rational is based to a large extent on deciding who should have access to federal contracts based on the principle of set-aside. Size standards in this case should be quite different from those that apply to the research financing of high-tech start-ups. The example is a challenge to the European Commission position where it encourages all member states to adopt a single set of standards for all policy purposes, even for research funded in the context of sectoral or regional development, where a more differentiated approach might even be advisable.

2.3.4 Size Standards for the SBIR Program

The eligibility criteria for the SBIR program, comparable in many ways with the SME program of H2020, are much looser than those applied in the EU.

Essentially a single criterium that the company and its affiliates employ no more than 500 people. No financial criteria apply. Other than that, the eligible company much be

- A for-profit company with a place of business in the US
- More than 50% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in the US, or
- More than 50% owned and controlled by another for-profit business that is more than 50% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States.

So, eligibility is established based on criteria of independence and the number of employees of the company and its affiliates, and there is no limit on company turnover or strength of its balance sheet.

The definition of “independence” is also of interest because of the importance it attaches to the role of natural persons and to concept of affiliate.

It is also interesting that the company is not required to be autonomous in any sense. The main concern is that it is owned and controlled by US based entities. So, a firm that is 60% owned by another US company is eligible. But if it were 60% owned by a Chinese or European entity then it would not be eligible.

The approach is significantly different from that of the EU which is based on a classification of a company as being “autonomous,” “partnered” or “linked” and is inherently suspicious of outside interest of any corporate kind. It is therefore worth studying by experts in Europe.

The US rules of affiliation are complex[23] though arguably less complex than the rules of "genuineness" in Europe.

Having said that, this is not how small business is defined for all purposes in the US, and the SBA is required by law to

- periodically review the definitions of small business being used,
- propose a methodology for revising those definitions and
- propose changes if necessary and put these proposals out for consultation with industry.

2.3.5 Access by Small VC-backed Business to the SBIR Program

The issue of access to small business programs by VC- and PE-backed companies has elicited much debate in the US. At issue is the fact that if the number of employees of a VC backed enterprise includes those of its investors and their portfolio companies, it is relatively easy to exceed the threshold for eligibility as a small business. This is seen by many as unfair and not in the public interest. It is seen by others as yet another way to "bail out the banks".

There have been efforts in the past to create permanent exemptions for VC backed companies. These have failed on technicalities and confusion on the part of supplicants with regards to basic concepts and definitions. The main breakthrough came with Obama signing the National Defence Authorization Act for Fiscal Year 2012. This included a provision allowing companies that are majority owned and controlled by VC funds, to compete for contracts under the SBIR program.

More specifically, the new law permitted funding agencies to apply what became known as "Section 5107 Authority," a reference to the article of the legislation allowing SBIR awards to companies where majority control was held by venture capital operating companies (GPs) just as long as no single venture capital company owned more than 51% of the awardee. Some agencies were happy to embrace Section 5107 Authority, but others rejected it. The SBIR is administered by 11 different funding agencies, and the end result is that some of these could award grants to VC backed small businesses, whereas others could not.

This story is told in more detail in 2016 a blog by J. Scott Merrell of Hutch Law[24], offering its services to small businesses who might need guidance. Its message was a cautionary tale to VC backed companies and their backers, advising them of the risk of wiping out a potential source of revenue for their portfolio company.

The SBIR provides a list of those agencies that have accepted to avail of this authority[25]. For the moment (July 2020) only 3 are listed, namely the NIH, the CDCP, and ARPA. It is clear that this situation creates some complexity and the possibility for confusion. Guidance is provided on the SBIR site on how to reconcile this new freedom with the rules on affiliates[26].

More details are provided in "Annex 14: Further Notes on the SBA, Size Standards and CVOVID-19." The decision to allow access was a policy decision that overrode other considerations. Since 2012 the impact of the decision has been evaluated. So far it seems successful and despite a small number of objections based on a fear that big business might use a VC cover to pretend to be small to access funds intended for small business, it has been continued.

The issue came up for debate again more recently with regard to the PPP program, where the VC industry campaigned for their portfolio companies to be guaranteed access to support offered by the PPP program.

2.3.6 Access by Small VC-Backed Business to the PPP Program

As soon as plans for the PPP programs were announced, journalists, commentators and advocates for small business raised the issue of how to deal with VC backed small enterprise. The main concern was one of fairness, and a worry that many at-risk companies could be denied the benefit of a PPP loan, because all of the money available may be used up by their relatively stalwart VC- or PE-backed rivals. There was also an element of popular outrage by people who saw the main beneficiary as being the PE or VC fund itself, and not the business in which they had invested.

In the end the consensus was that VC- and PE-backed companies should be able to access the program, and the great size of their backers and affiliates, which normally figure in the determination of the "size" of a company, will not count or push them over the threshold into the realm of big business.

The issue is more complex than at first sight in the sense that the top management of funds and of the companies they invest in, could be accused of 'neglect of their fiduciary duties' were they to ignore the offer of a PPP loan to help them through the difficult times, an accusation that provides grounds for dismissal. In a highly litigious country like the US, also characterized by intense competition for top jobs, it would be imprudent for a manager to fail to apply for the PPP. In the end many VC- and PE-backed companies successfully applied for grants. Some of them have already returned the money on the basis that they no longer need it, or in some cases as a response to protest by an outraged general public.

The PPP loan program was designed to help companies whose businesses had slowed down or even stopped due to the pandemic. The loans were offered at 1% interest but did not have to be paid back if the recipient spent the money within 24 weeks, with 60% or more going on payroll. Companies including the New York Times and the Washington Post, sued the government to make sure that data on recipients would be made publicly available. On July 7, 2020, the SBA released the data on all the companies that had received support so far. It has since been dissected and analysed by Bloomberg, CB Insights, Forbes, Pitch Book, Reuters, Tech Crunch, and the Information[27]. Not all beneficiaries were small companies. Large PE-backed firms that benefited include restaurant chains such as P. F. Chang's China Bistro Inc. and TGI Fridays and Media companies such as Forbes Media and The Washington Times. Organisations such as CB Insights and Pitch Book needed this data to update their databases tracking the financial trajectories of the VC- and PE-backed companies they track. They found that

- Almost 10,000 VC- and PE-backed companies (9,657) received PPP loan support
- They received $14.3B of the approximately $500B that had been distribute
- Many loans were for less than $150k but for those above $150k, 5650 went to VC backed companies and 2528 went to PE backed companies
- 80% of loans were for less than$1M
- 250 were for between $5M and $10M
- 429 companies raised financing rounds after receiving PPP loans and 125 were acquired

Business Insider provided interesting observations about the participation of start-ups in the PPP loan scheme[28]. They noted that

- 4,800 PE- and VC-backed recipients had raised finding rounds in 2018 to 2020
- 2,267 of those raised funding in 2019
- 3 of the top 5 investors whose portfolio companies applied for help were start-up accelerators, such as Techstars and Y Combinator

On that basis it seems that somewhere between one third and one half of PPP loan recipients were in the start-up or early stage of their growth process.

As far as I can tell, no study has been done to determine how many of these companies would have benefited from the program, if the full rules of affiliation were to apply. It is highly likely that someone with access to proprietary databases, such as hose of Pitchbook or Dealroom, could make such a determination, if one were needed.

It should be clear from the above, that in the US at least, exceptions to the usual rules have been created, to allow access by VC and PE-backed enterprise to the small business research and innovation programs, as well as to the soft-loan facilities created in the wake of the pandemic.

It has to be said that the decision to allow accommodate VC- and PE-backed companies in this way has been controversial. Some commentators are strongly of the view that this should not be allowed on the basis that it is just another case of "bailing out wall street."

But this view is too simplistic. It is worthwhile going back to basics, to understand the role that SMEs play in the economy and the role that VC plays in nurturing them through successive stage of growth, to clarify what is at stake and establish the merits of such a move before jumping to any such conclusion.

2.3.7 The New SBA Rules of Affiliation and Criteria for Independent Ownership and Control

US small company law requires that "a small-business concern … shall be deemed to be one which is independently owned and operated, and which is not dominant in its field of operation."

This resembles in many ways the criterium used in the EU definition, for a company to be "a genuine SME."

The SBA is clear[29] that when computing the number of employees or the annual receipts of a small business, it should include those numbers for all affiliates in its calculation.

Furthermore, the concept of affiliation is quite broad[30] and the SBA will take account of factors such as "ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists." At issues is the power to control and the SBA may consider a company to be controlled or to control, whether that power is exercised or not. It includes cases where "an individual, concern, or entity exercises control indirectly through a third party" and gives the SBA the right to "consider the totality of the circumstances and may find affiliation even though no single factor is sufficient to constitute affiliation."

The most up to date relevant legislation is contained in Title 13 Part 121 of the Electronic Code of Federal Regulations[31]. The detailed rules of affiliation are different per program. For example, the rules that apply for small businesses availing of federal contracts on the principle of set-aside[32] are different from those that apply to small businesses taking part in the SBIR program[33] and are different again from those that apply to small businesses taking part in the Business Loan, Disaster Loan, and Surety Bond Guarantee Programs of the SBA[34]. In addition to these variations, the general law[35] contains many exceptions to the rule for affiliations.

Finally, it is instructive to note that the SBA gives companies that have been excluded from its programs on the grounds of affiliation, the right of rebuttal, the right to challenge the judgement of the SBA by providing evidence or arguments intended to demonstrate that it is not in fact affiliated to certain entities as judged by the SBA. Depending on the program some of the cases and criteria are rebuttable, and some are non-rebuttable.

These observations on the application of affiliate law to small business size standards, can be taken as evidence of the complexity of the concept, and the need for flexibility in its application, in order not to deprive high potential enterprise from important opportunities for growth.

The rules that apply for the SBIR program state that for a small business to be independently owned and controlled and thereby eligible for funding from the SBIR program, it must be[36]

- A concern which is more than 50% directly owned and controlled by one or more individuals who are citizens or permanent resident aliens of the United States, or by other small business concerns, each of which is more than 50% directly owned and controlled by individuals who are citizens or permanent resident aliens of the United States…
- A concern which is more than 50% owned by multiple venture capital operating companies, hedge funds, private equity firms, or any combination of these…

In these situations, it is not considered an affiliate and for the purposes of calculating its assets, receipts, or number of employees, it does not have to count those of the owning-controlling entities.

Although the SBA may still consider a company to be affiliated to any of these for other reasons, exceptionally and on a case by case basis, this is the default situation.

An important exception arises in the cases where VC- or PE-backed companies, may be excluded where the company is more than 50% owned by a single venture capital operating company, hedge fund, or private equity firm. The regulation states that

- No single venture capital operating company, hedge fund, or private equity firm may own more than 50% of the concern unless that single venture capital operating company, hedge fund, or private equity firm qualifies as a small business concern that is more than 50% directly owned and controlled by individuals who are citizens or permanent resident aliens of the United States.

3 Conclusions

There is considerable variation in the way SMEs are defined around the world. For example, there are more than 50 different definitions in use outside of the European Union. EU member states apply definitions that differ significantly from those applied by the European Commission, Italy being a case in point. In the US too, many definitions apply. They are determined by the US Small Business Administration. They vary by sector and program on the basis of policy goals to be achieved. One program alone, the Small Business Set-Aside program, employs over 1,000 different sets of size criteria. These are subject to periodic revision, reflecting changes in the structure of the economy, the role of concentration and the presence of dominant players, the impact of technology and other criteria such as their impact on related policy goals. These size-criteria vary automatically between periodic revisions, based on indices linked to criteria such as inflation and the cost of labour.

3.1 The Possibility of Multiple SME standards applied in EU Programs

The reality of multiple standards for SME definitions being employed around the world, creates a dilemma for the European Commission in the design of its SME oriented European programs. Allowing companies from different member states to apply to SME programs, on the basis of criteria that depend on where a company is located, would be a recipe for chaos. Nevertheless, exceptions might be possible for programs that are either sectoral or regional in their scope. Programs applying SME size standards which vary by sector across all member states, or standards which vary by region and apply across all sectors might have a role as tools to fine-tune the development of EU regions or sectors. Should the EU decide to experiment with this, it could learn from efforts to rationalize the definition of the SME around the world, in particular from the experience of the US. Such efforts could address issues related to the ambiguity of concepts and complexity of rules, that already exist. The methodology applied for the periodic revision of definitions by the Small Business Administration in the US, is relatively well documented and provides a good place to start to understand how to do this.

Any effort to act in this way will inevitably be challenged. For example, the small business set-aside program managed by the US SBA, has opposed systematically opposed by dominant industrial players since its inception on that basis that such programs unfairly reduce their market share and interfere in areas where they are better placed to serve. This kind of opposition is of course welcome on the basis that it forces agencies charged with the design of such programs to better define their goals and intervention-logic.

In addition to clarity of purpose, there is arguably a need for greater clarity of formulation, in order to facilitate program implementation. This is true of both of SME definitions in both the EU and the US, where the law courts have on occasion been required to clarify the rules and their application, and where the public servants involved int running the corresponding programs have difficulty dealing on the eligibility of certain cases.

3.2 The Public Interest Served by SMEs and the VC Industry

It is useful to clarify the issue of public interest. Absent other options, this supports argumentation that provides for exception to the application of the SME definition. The case in point being fair access to SME funding for VC backed small business.

Europe was once seen as a laggard in its ability to cultivate the VC sector as an engine of growth. Evidence provided by observers such as Pitch Book, Deal Room, Tech Crunch and Sifted, suggest that this is no longer the case. Before the pandemic, an increasing number of European venues were emerging as sources of entrepreneurship, start-up driven growth, high growth enterprise and even unicorns. This dynamic, already seen as something to nurture before the pandemic, is arguably more important today for the contribution it can make to the COVID recovery and to the green transition.

For this reason, I have provided annexes to the main paper, which deal with the issue of public interest, in order to support a revision of the SME definition in Europe, that will ensure fair treatment of VC backed small business. These annexes provide a brief review of theories of growth of the enterprise and the entrepreneur, of the role of the SME in society and in the economy, as well as the role of VC in supporting the growth of start-ups and high growth SMEs. In summary, the role of public and private funding is far more complex than appear at first sight. An examination of the detailed financial trajectories of a small number of start-ups shows that there is no simple cut-off where the burden of "responsibility" for the welfare of an SME shifts from the public to the private sector. Both public and private sources of finance are needed to support SME

growth. They are highly complementary in their form and in what they set out to achieve. Evidence suggests that VC has an overall positive impact on the development of the SME. Furthermore, the methods applied by VC to the management and development of portfolio companies has evolved continuously over the years, and has been responsible for waves of innovation in understanding the stages of growth of the company and in the methods used to develop portfolio companies, from pre-selection to selection to exit. This evolution in the nature of VC support for start-ups and HGEs, driven by a deeper understanding of the nature of the start-up and its development needs, has led to innovations such as the lean-start-up methodology, the professionalization of support for start-ups at earlier stages of growth such as seed and pre-seed, the introduction of increasingly founder-friendly models of financing such as RBI, hybrid models combining equity and debt, as well as so called VC2.0 models. The VC industry has increasingly adopted new more founder-friendly models of ownership based for example on dual-class share structures, and innovative exit modes such as IDOs LTSE listings and the use of SPACs.

I believe that a deeper understanding of the VC-PC relationship and related processes, would help SME program designers better understand the public interest at stake, when considering how to apply the SME definition to the case of VC backed SMEs, if and how exception should be made for VC backed enterprise in the application of criteria related to ownership and control.

3.3 The Purpose and Application of Rules relating to Ownership and Control

The most important source of confusion in the application of the SME definition arises in relation to issues of ownership and control. For companies which are subsidiaries or parent companies of another, linked- or partner- companies in the language of the EU, a complex set of rules apply to determine if the company is a "genuine" SME. The general impression is that these rules are motivated by a desire to ensure that the company in question is not really a big company, pretending to be a small company, with a view to misappropriating public funds.

To shed light on this possibility and understand how this might arise in the case of companies that applying for research and innovation funding, I explore how this actually does happen in the case of the small business set-aside program in the US. Large companies play a wide range of games to "win back" contracts that they feel have been unjustly awarded to small companies. These games include the setting up of shell companies, the purchase of the winners of set-aside contracts, as well as the payment of kickbacks and collusion. To gain further insight into how similar risks might arise in the case of VC backed enterprise, some of the annexes to this paper explore the general problem of company fraud, fraud in PE and VC, at the level of the GP, the LPs and their portfolio company.

To shed light on the possibility of collusion of some sort involving LPs and GPs which intend to misappropriate research funds awarded to a portfolio company, I go to some trouble to explain the nature of the relationship between LPs, GPs, and their PCs. These relationships are full of tension and possible causes of conflict. They are highly constrained by contracts, codes of conduct and other factors such as reputation risk. These relationships do break down and sometimes lead to high profile court cases that play out in the international press.

The general conclusion is that fraud and malfeasance of all kinds occur everywhere. But this is generally related to things like over-charging for fees, breach of contract and the bad behaviour of people in places of responsibility. But these kinds of fraud can be perpetrated by any kind of organization regardless of its size and regardless of whether it is from the public or private sector and are not specific to SMEs or VCs. Overall, there appears to be very little evidence of GPs an LPs colluding to misappropriate money intend to support the growth of an SME on the basis of research and innovation funding. Fears related to the possibility of large companies misappropriating research funds intended for SMEs, appears to be based on intuition, perception, or prudence rather than evidence for the existence of a real problem that needs to be addressed via complex rules.

On the subject of VC ownership and control of portfolio companies, one issue is the material risk this may pose for a system intended to support SME growth on the basis of enhanced access to research and innovation funding. Another issue relates to the very nature of ownership and control. In my view these are open to challenge in terms of their formulation and in terms of their interpretation for the case of VC-backed small enterprise.

The formulation of those rules tacitly assumes a certain kind of relationship between ownership and control. Roughly speaking it equates ownership with control and with access to resources of subsidiaries, as well as to those of parent companies and their subsidiaries. This is a very poor reflection of reality? Certainly, in the case

of a VC backed company. In particular, the use of dual share structures, which has become increasingly common for high tech start-ups, was designed to break the link between ownership and control, guaranteeing founders higher levels of strategic control, despite the lower levels of ownership they may have post-exit. As explained in the corresponding annexes, the LP-GP partnership structure on which most VC funds are based, implies that the fund itself is not even a legal person. It is the name given to a set of agreements involving the LPs, the GPs, and the PCs. This structure is intended to ensure that the LPs which are the main owners of the PCs, are kept away from the management and control of the PCs in order to afford them limited liability and protect them from the possibility of lawsuit by disaffected founders. O the other-hand the GPs have unlimited liability, they jealously guard their independence from the LPs on the basis of the LP-GO agreements, have very limited ownership of those PCs, of the order of 2%, over which they exercise high levels of control in order to ensure their growth and prepare them for an exit event. On this basis, the SME rules related to ownership and control provide a poor reflection of the reality, and the case of VC-backed enterprise should be interpreted with this in mind.

3.4 Exceptions to the General SME definition in the US and Europe

The SBA is responsible for the overall design and funding of the SBIR, the federal program for Small Business Innovation and Research. Up to 24 Federal Agencies take care of the detailed design of SBIR calls, as well as the selection and monitoring of projects. Over the first two decades of its operation, a number of VC backed companies took part in the program. However, an administrative law judge ruled that for technical reasons VC backed businesses did not satisfy the conditions for eligibility and ruled that such businesses should be denied SBIR funding.

Various unsuccessful attempts were then made to carve out exceptions to the general rule, allowing VC backed, but each time they failed on technical grounds. In 2011, the so called "Reauthorization Act" amended the rules of participation to allow the participation of small businesses that are majority owned by "multiple venture capital operating companies, hedge funds, or private equity firms." The justification provided was that this would encourage further investment by venture capital, hedge fund, or private equity firms, in small business innovation. The principle that VC backed enterprise could take part in SME R+I programs, was now established, and has since been referred to as the "5107 authority." On the basis of this legislation, the SBA delegated authority to the federal agencies, so that each might allow the participation of VC backed enterprise, such they choose to do so. Some agencies have decided to do so, but most have not. The impact of this option was evaluated in 2014 and 2018. The feedback has been positive. In those sectors that allow it, the participation of VC backed enterprise is slowly growing, no adverse effects have been observed and the authority remains in place for those agencies that wish to apply it.

The issue of access to SME programs by VC backed enterprise, arose once more in relation to the US response to the COVID pandemic, on the basis of the CARES Act and those parts of the PPP or Pay-check Protection Program, managed by the SBA on behalf of small business. The popular view included the idea that VC or PE backed enterprise, should be taken care of by those institutions that have invested in them. To someone who does not understand know the system works, it seems reasonable that fabulously wealthy organisations such as VC and PE funds, have the resources to step in and take the measures needed to rescue their portfolio companies. But reality is more complex than that. I have therefore gone to some trouble in the annexes in particular to explain how the system works, and how the use of all of the money that some might think of as "sitting around" is highly constrained by layers of contracts. I tried to convey the complexity of the relationships between the portfolio companies, their GPs, and LPs, as well as the tensions that exist and the conflicts that can arise. My goal being to demonstrate that while the popular idea of the funds bailing out their portfolio companies may seem only right and fair, at is far from easy to do and far from being the best action under the circumstance. This reasoning, initially provoked by a sense of popular outrage at the idea of VC and PE backed small business being "bailed out" applies equally to the case of research funding, as it does to rescue funding in the context of the pandemic.

The EC too has shown itself capable of creating exceptions to the general SME definition. In particular it has created exceptions to the rules on ownership and control, for categories of investors that include universities, non-profits, regional development funds and autonomous local authorities.

3.5 Suggested Ways to Proceed

Given the wide variation in the definition of SMEs within Europe and around the world, it seems possible in principle and potentially useful in practice, to extend the concept of "variable geometry" programming to

accommodate variable definitions of the SME, as a tool for fine tuning approaches to the economic development of regions and sectors.

Arguably, there is a clear need to clarify and simplify the existing EU definition, in particular in how it applies to issues related to ownership and control. Such clarification would benefit from a better understanding of the partnership structure of VC funds, the nature of the relationship between the portfolio companies and their GPs, the nature of the relationship between GPs and their LPs, and what this means for issues related to the ownership and control of portfolio companies.

As is already the case in the case for the SBIR program in the US and more recently for the SBA managed part of the PPP, and as is already the case in the EU, it is possible to consider exceptions to the application of the SME definition. In this case the goal would be to ensure fair access to SME programs for VC backed small enterprise, on the basis of the public interest.

Finally, it may help to recall that EU research programs contain many mechanisms intended to protect against fraud or misuse of public funds such as the grants awarded to SMEs for research and innovation. These mechanisms include the process of project evaluation and selection, the contract between the grantee and the agency, the formal monitoring by dedicated project officers employed by the agency and by external experts contracted by the agency, of both project progress and budget expenditure, on the basis of a detailed description of work, as well as the possibility of carrying out an a-posteriori audit of the project. Perhaps this is enough to ensure against the risk that a VC backed SME is really just “a big company pretending to be small” for the purpose of misappropriating funds intended to support research and innovation by SMEs.

List of abbreviations and definitions

ARPA	Advanced Research Projects Agency (US)
CAC	Customer Acquisition Cost
CDCP	Center for Disease Control and Prevention (US)
CVC	Corporate Venture Capital
DPO	Direct Public Offering (direct listing)
ECB	European Central Bank
ECHA	European Chemicals Agency
ESG	Environment Society and Governance
EVCA	European Venture Capital Association (now IE)
FINMA	Financial Market Supervisory Authority of Switzerland
GEM	Growth Enterprise Market (Chinese exchange for HGE)
GP	General Partner
GVC	Government Venture Capital
HGE	High Growth Enterprise
IBO	Initial Bond Offering
IE	Invest Europe (former EVCA)
ILO	International Labour Organisation
IPO	Initial Public Offering
LBO	Leveraged Buy-Out
LP	Limited Partner
LTSE	Long Term Stock Exchange
LVC	Lifetime Value of your Customer
MVP	Minimal Viable Product
NIH	National Institutes of Health (US)
NVCA	National Venture Capital Association (of the US)
OECD	Organization for Economic Cooperation on Development
OTC	Over The Counter
PC	Portfolio Company
PE	Private Equity
PEF	Private Equity Fund
PIPE	Private Investment in Public Equity
PPP	Pay-check Protection Program
RBI	Revenue Based Investing
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals (regulation)
SAFE	Short Agreement on Future Equity
SBA	Small Business Administration
SBIR	Small Business Innovation and Research program
SEC	Securities and Exchange Commission (US)

SECA	Swiss private Equity and Corporate finance Association
SFAMA	Swiss Funds and Assets Management Association
SIFMA	Securities Industry and Financial Markets Association (US)
SME	Small and Medium Sized Enterprise
SPAC	Special Purpose Acquisition Company
SPAV	Special Purpose Acquisition Vehicle
VC	Venture Capital Fund
VCF	Venture Capital Fund

Annexes

Annex 1: Ambiguous Language

Based on the various challenges made in Europe and on the basis of court-cases in the US, key actors have had difficulty understanding and applying the rules relating to issues such as autonomy, ownership and control, as well as affiliation, as intended by public administration in the defining size standards for small businesses and SMEs.

So, it is worth looking at these issues more carefully, and taking time to either simplify the rules or clarify their interpretation. This annex is a collection of thoughts based on my own experience of trying to understand and apply these ideas. My hope is that imperfect and incomplete as they are, they might provide a starting point for efforts to clarify the intention of the rules and the practice of their application.

The SBA relies on the concept of "affiliation", rather than that of "partner" or "linked" company.

Nevertheless, the language of the SBA is not innocent in terms of ambiguity. For example, it refers to companies as being affiliated, when one has a controlling stake in the other. It is ambiguous on the issue of which company is 'holding' and which company is being 'held.'

The text often seems to imply that both companies are held where in fact only one is held and is considered by most accountants to be the affiliate, and the company that holds its shares as the parent company.

In general, it is common to refer to a company in which one has a minority stake as an "affiliate" and to refer to company in which one has a majority stake as a "subsidiary". The company that holds those stakes is commonly referred to as the "parent" company.

It is also quite common to refer to companies that share a common parent as "sister" companies. The details may vary from one region to another. But these are concepts that are much easier to understand that those used, both by the European Commission and the SBA.

I add to this the ambiguous use of the term "partner" in the SME definition, and an improvement in the use of concepts such as "control" which should distinguish between "control" which is "direct" or "indirect", "formal" or "informal."

Ambiguous language has caused problems for entrepreneurs trying to access small business programs. These are most visible when they end up in a court case or legal challenge as has happened in both the US and the EU. Most aggrieved businesses will not go so far as to take a case to court, so there is a lot hidden under the surface.

Anecdotally, there are businesses in Europe that feel excluded from SME programs by virtue of their being backed by venture capital funds.

An improvement in language could go a long way to making the system of aid for small companies more eligible and more accessible, by aligning itself with terminology used in accountancy and in management. It might also improve the ability of regions and other actors to devise programs to support the growth of small business, based on the specificity of growth challenges felt at regional level.

Annex 2: Legal Persons, Natural Person and Partnerships

In the case of corporations, profits are usually distributed to shareholders pro-rata based on the number of share held, usually in the form of dividends. In other words, an owner with 25% of the shares, will receive 25% of the dividends, whenever there is a distribution of profits. In the case of limited partnerships however the pro-rat rule does not necessarily hold. The GP for example may only hold 2% of the portfolio but is usually paid on the basis of a 2+20% arrangement where it gets an annual 2% management fee, plus 20% of any eventual profit made on the amounts invested. There are many variations on this. The management fee may decrease once the "investment" phase is over, and the 20% may apply to gains above a certain threshold. But on the face of it at least, the GP will obtain 20% of the amount invested over a 10-year period and 20% of the profits made on that investment. Roughly speaking the partnership structure allows the GP to obtain remuneration which is an order of magnitude greater than that which it might obtain under a corporate arrangement.

VC funds are organized as partnerships. It is worth examining this in some detail because it means that a VC fund is different from both a company and a natural person. The distinction has been a source of confusion with regard to the definition of an SME and the eligibility of VC backed SMEs for grants and other assistance, both in the EU and in the USA.

This area is complex and subtle. Ambiguity can arise and treatment varies in detail from country to country. Quintana Adriano has given an overview and discussion of the differences in a paper from 2015[37]. What follows is of necessity a simplification intended to shed light on some issues which may be of relevance for future discussions on the definition of an SME in Europe, and its impact on the eligibility of VC backed businesses for state-aid.

The statement that a company is a legal person signifies that it is a separate legal entity from its shareholders. One consequence of this distinction is that a company can be sued and held responsible for its actions, independently of its shareholders. In general, the shareholders will not be liable for the actions of the company and the most they stand to lose is the amount they might have invested. A natural person is someone with a beating heart, a physical or biological being. The natural person may be a founder, or manager of a company. They may be an owner or shareholder of a company, but they remain distinct from that company, they are endowed with certain duties or responsibilities with regard to that company and subject to different laws.

SME eligibility for state aid has been questioned in the US on the basis of confusion arising in the SME definition which refers to ownership by natural persons, and the presumption that for the purpose of eligibility, VC funds should be considered as equivalent to natural persons.

A partnership is not a separate legal entity. It has no legal personhood separate from that of the partners. A practical consequence of this being that one cannot sue a partnership. One can only sue a partner. The structure of limited partnership, which is the preferred structure of a venture capital fund, specifically provides for one of the partners being given complete control the business of the partnership. This partner is usually a company, it is referred to as the general partner (GP), it has total control of the business of the partnership. That is the selection of portfolio companies (PCs) in which to invest the money of the partners, the mentoring, monitoring and control of the PCs, and negotiation with the PCs of the nature and timing of exit events. The GP has unlimited liability for the business of investing. The liability of the other partners, known as the limited partners or LPs, is limited to what they have invested in the PCs.

In all countries a company must be registered in a company register, and annual accounts must be deposited in some institution such as the Banque Carrefour des Entreprises in Belgium. But this is not always the case for a partnership. The essence of a partnership is the partnership agreement governing the business that they will do together. In many countries, there is no obligation to register a partnership. However, there is often an obligation to register a venture capital fund, and VC funds may be required to observe certain legal requirements, before being allowed to operate as such. Professional associations that represent the interests of investors exist in most countries. They usually have working groups that develop model contracts, that embody what is considered good practice at any time, and which address issues of concern for the industry. The two areas where this contractual issues are important are:

- **The relationship between LPs and GPs**: This is contained in a partnership agreement, which may be supplemented by
    - **side-letters** which customize the PA to needs specific to individual LPs, and

    - **segregated accounts** which allow for the confidential management of investment activity on behalf of individual LPs.

- **The relationship between the GP and PCs**: This is governed by a range of contract-like documents which include
    - The Term Sheet
    - The Investors Agreement
    - The CAP table
    - The Shareholders Agreement
    - The Board Regulations and articles of association

A particular weakness in the EU definition of the SME its attempt to equate issues of "control" into issues of "ownership." The relationship between ownership and control is actually quite complicated.

This reasoning appears to assume the convention of one-share one-vote. Reality, especially in the case of venture backed technology companies is more complicated. Increasing interest in the use of dual class share structures, with weighed voting rights), is a case in point. One of the most recent VC exit innovations is the LTSE or Long-Term Stock Exchange which propose to weigh voting rights based on the length of time share has been held, and the proposal supported by the FT Editorial board of introducing sunset clauses, as well as the use of A, B and C class shares by Google to differentiate control by founders and executives, employees and institutional investors, may be seen as a harbinger of innovations in corporate governance that temper the short termism and propensity for predatory behaviour by activist institutional investors.

Although this issue appears only to be of interest to post-IPO phase of a HGE, it is of relevance to the relationship between LPs, GPs and PCs in the sense that it is in the VC backed phase that issues related the nature and timing of the exit event are discussed and preparations made. It is not irrelevant that many of these innovations are currently being pioneered and championed by high profile early stage investors and well know innovators in methods for the development of start-ups and HGEs such as Eric Ries, one of the fathers of the lean start-up movement.

It is hard to make generalisations on complex issues such as these, where differences occur from one country of application to the next. So I have to qualify my remarks saying that they have been made in order to illustrate how ambiguity can arise when considering the issue of ownership and control as it applies to VC-and PE-backed enterprise, by virtue of the partnerships structure. Definitive authoritative statements can only really be made based on specific examples, where the countries and courts whose laws apply is made clear from the start, and only then based on argumentation provided by experts with up to date knowledge and understanding of the issues at hand.

Annex 3: Stress Testing the EU Definition of the SME

So far, I have failed to find a clear statement in relation to the "problems" or "bad behaviours" that the EU definition of an SME is intended to avoid. This is worth doing as it will provide a basis for testing any propose new definition, to see if it really works. A simple and effective approach is to employ what people in security call a "table-top exercise" a simulation of when things go wrong, with each actor responding to a situation at the table playing their role. Another approach is the use of a "stress test" where the system is presented with a series of extreme cases, where each actor responds within the rules as they apply them, and with the resources they have available, to a hypothetical scenario. In each case the organizer of the test carries out an independent assessment to see if the system reacts adequately to the situation as it presents itself. Usually the emphasis is on testing extreme "bad" cases that can arise, but there is also considerable value in testing a range of "good" cases to make sure that the system does not unfairly treat those it is intended to benefit, as an unintended consequence caused by complexity of rules which are hard to understand and difficult to apply.

As a defence against such unintended consequences, the US SBA gives companies the right of rebuttal. In other words where companies think they are being unfairly treated by the system, they can make their case and ask for an exception to be made on the basis of first principles, rather than a rigid adherence to rules that may contain unintended consequences which violate the spirit of and are in contradiction with the intended policy goal.

The guide refers to the idea that where there is ambiguity, the case for the eligibility or exclusion of a business from an SME program, may require treatment on a case-by-case basis. The impression is that this really only applies to cases where the rules are ambiguous, for example cases where control of company is exercised neither through capital or voting rights, but via contracts, agreements, commercial arrangements, or informal family ties. Arguably it should also apply to cases where an enterprise feels it is being treated unfairly by rules whose interpretation is clear, but which have unintended consequence due to the complexity and rapid evolution of the situations that the rules are expected to address.

Where the SME is a Parent Company

Consider an enterprise (A) with a 40% ownership stake in another company (B), but no voting rights. Under the existing SME definition, A is not considered to be autonomous, despite the fact that A has no influence over the affairs of B and B has no influence over the affairs of A. In addition to its ownership share of B, which will show up in the annual accounts of A, along with any income it may receive from B in terms of dividends, A must now add 40% of the turnover of B to its own turnover and 40% of the balance sheet total of B to its own balance sheet total, despite the fact that it has no influence over the business of A. Furthermore, it must add 40% of the number of employees of B to its own number of employees, despite the fact that A has no role in the hiring and firing and development of the employees of B, despite the fact that they do not work for B, and even in a situation where B might have signed a no-poaching agreement with B. This is what should happen when applying the existing rules for defining an SME. It does not sound like a fair basis for judging the size of A. It would seem fairer to consider A and B to be independent companies, A to be autonomous from an SME definition point of view and evaluate its size entirely based on its own activities.

Consider a case where A has 5% ownership stake in B, but 40% of the voting rights. This may allow A to contribute to certain decisions of B, but it does not give it control. It does not give A access to 40% of the profits or assets of B. At best it might give A access to 5% of any dividend distribution, but there may be other agreements or conventions that limit the ways in which A can be involved in the business of A, which are independent of As ownership stake or voting rights. Nevertheless, in calculating the size of A, based on the SME definition as its stands, A must add to its measure 40% of the turnover, balance sheet total and number of employees of B.

Even in a case where A has 60% of the voting rights and therefore control over B. It does not necessarily have access to the assets of B. Most likely, it is constrained by contracts or agreements, in what it can take away from B for its own use. At the very best it might be limited to taking back what it has put in, but only on condition that the resources are available for this to happen. Although it will not be able to access the resources of B, it will be obliged by the rules on the definition of SMEs to count 100% of the turnover of B, 100% of the BS total of B and 100% of the personnel of B, to its own figures, in order to calculate its size.

In cases where A owns part of another company B, ownership of B is already reflected in the balance sheet of A, and any contribution from dividends will be reflected in its turnover. This suggests that adding turnover of as required in the application of the SME rule, may in fact amount to double counting. Perhaps there is no good reason to add to this when trying to determine the size of A and its eligibility for SME programs.

When the SME is a Subsidiary or Affiliate

Take the case where another company C holds shares, say 30% or 55% of A, the enterprise that hopes to apply for SME funding, but C does not have a board seat on A and therefore no voting rights. Perhaps C is lending to A and taking shares as collateral, based on the (admittedly forlorn) hope that those shares may one day be worth a lot of money. C has no more intention to give to A and its only interest is that A will one day pay back the money owed. On the other hand, A has no influence over C, no access to the resources of C, and no use for the employees of C. All A wants to do is to grow, pay off C and then move on without C. Nevertheless, in these qualitatively similar cases, A must add 30% of the turnover, BS total and headcount of C to its own, to see if it will qualify as an SME. In the second case, it will have to add 100% of its TO, BS total and headcount to its own in order to qualify. Again, in his situation C has no control over A, it cannot divert funds from A to C and it cannot influence the direction of its business.

The SME definition once more inflates the size of A and can easily lead to a situation where the size of C will disqualify the eligibility of A, despite the obvious independence of their business, and autonomy of A.

None of these situations, which follow from the application of EU definition of SMEs, seem fair in terms of their impact on the size estimate of A. They all arise from features of the SME definition which are worthy of review.

- Confusion between concepts or "ownership" and "control." These are, both in theory and in practice, **independent** concepts. It does not make sense to apply a threshold based on a choice between a criterium of ownership (the % shareholding) or and a criterium of control (the % voting rights). These measure different things and are not a-priori interchangeable. It is fair to ask what the "ownership" criterium is intended to determine, and what the "control" criterium is intended to determine and on what basis can one be exchanged for another.
- The use of thresholds such as 25% and 50% in different parts of the definition. These appear to be arbitrary and arguably have no basis is science.
- The weighting by interest (share of capital or share of voting rights) of the contribution of partners to the criteria used to determine the size of an enterprise (TO, BS and number of employees) is questionable.

There are other issues to be considered, which may be of relevance when considering the specific role of venture capital in SME development. The use of the term "partner" in particular seems problematic. This has a separate meaning in corporate law. In particular with regard the structure of venture capital which is usually based on a limited partnership.

When the SME is backed by a VC or PE Fund

European Commission documents acknowledges that ownership is not the same as control and that control may be exercised in different ways including via contracts and agreements, commercial arrangements, dominant individuals, and family members. They also refer to the limited partnership structure of the venture capital fund. It is in this context in particular that the EU definition of the SME appears to diverge from the reality it intends to reflect, in particular on the issues of ownership and control and for the case of venture backed enterprise.

A partnership is a general concept in business that signifies an arrangement between two or more people to oversee business operations and share any related profits and liabilities. It is quite distinct from concepts related to "ownership" which usually means holding shares in a company, or "control" which usually means having the right to vote on decisions or influence the day to day running of a company. Partnerships take different forms, the most common being general partnerships and limited partnerships. In particular venture funds are organized as limited partnerships, they are not corporations, and the use of the word partnership in the definition of an SME creates immediate cause for confusion, and arguably fails to adequately express what was originally intended.

Unfortunately, the language used to describe the situation of a VC backed enterprise is usually quite ambiguous. The ambiguity seems toa rise from the way in which a VC fund is treated and confused with that of a corporation.

A VC fund is usually not a company, but an arrangement described as a limited partnership[2], in which case it is not a legal person, and should not be considered as equivalent to a corporation. This issue is treated in more detail elsewhere in this paper, with a view to give a more complete understanding of the parties involved, their relationship to each other and to their portfolio companies, and to explore the issues of ownership and control that arise in this context. The literature contains a lot of "loose talk" about funds that may hold 20% or 40% or 60% of a portfolio company. On this basis alone and leaving aside considerations of control, the portfolio company could be considered to be respectively an autonomous company, a partner company, or a linked company. Assuming that the portfolio company is not the only one held by the fund, the portfolio company may be required to add 40% of the headcount, turnover and balance sheet total of the fund to its own number for the purpose of determining its size. It may also need to add that of the other portfolio companies as part of the calculation of its size. In the 60% case, the PC must add 100% of those numbers for the VC fund, to its own.

This kind of conclusion is inevitable based on a rigorous application of the definition and a loose consideration of a fund as a legal person similar to a corporation, which is generally not the case. When a venture fund is constructed as a limited partner, one of the partners is given exclusive responsibility for managing the fund, selecting, and developing the portfolio companies, helping the PC to prepare for an exit event. This is the general partner (GP) and its share in any investment is usually of the order of 2% of the overall investment. The "limited" partners of the fund enjoy "limited" liability by virtue of the fact that they delegate all responsibility for the selection and management of the PCs to the GP. As a rule, they exercise no control over the PCs and otherwise act independently in the context of the VC fund.

Taking the case of a fund with one general partner and four limited partners,

The partners make financial commitments to the fund and promise to make this money available for investment in a PC, when called upon by the GP, in what is known as a draw down. When the partnership agreement is concluded it may be that the four limited partners commit to sums that constitute 30%, 25%, 23%, 20% of the fund, with the remaining 2% being committed by the GP.

When a PC is selected for investment, the GP calls on the partners to put up their share of the money, on a pro-rata basis. In the case where the fund has a 60% participation in the PC, the share for each partner becomes 18%, 15%, 13.8%, 12% and 1.2% (60% of 30%, 25%, 23%, 20% and 2% respectively). None of which cross the 25% threshold for autonomy of the PC on the basis of ownership criteria alone.

In terms of control, the LPs have no control, their only relationship is with the GP and this is usually about things like GP fees and overall investment strategy. It should be clear that under these circumstances the PC is neither a partner company to, nor linked with, any of the limited partners.

The only entity exercising any control over the PC is the GP, which holds 1.2% of the PC's stock. The GP will exercise control over the PC. It does so via a seat on the board of directors of the PC. It exercises control in other ways for example by advising on the appointment of independent outside directors, and via the terms of agreements such as the shareholders agreement, and various other mechanisms such as "payment by tranche" where payment of amounts invested in the company are released to the PC on the basis of achieving mutually agreed goals.

The nature of GP (VC) control over the PC is the subject of much research. This issue is dealt with in more detail elsewhere, but it is worth noting here that the boards of VC backed firms tend to be quite active, that VC funds create significant added value for the firm above and beyond the money brough in from investors, and that they tend to provide support for PC strategy rather than setting it.

There is clearly some ambiguity and scope for debate in assigning a value to the level of control that a VC fund exercises over a PC (via its GP). In the extreme case where GP control over the PC is considered to be between 50% and 100%, the PC is treated as a "linked" company, and (according to the EU definition of the SME) 100% of the headcount, turnover and BS total of the GP, should be added to that of the PC in order to determine its size.

It is worth pointing out that the balance sheet of the VC fund and the balance sheet of the GP are two different things. The balance sheet of the fund is a way for the partnership to keep track of the activities of the fund. It is essentially a project budget. It will show what each LP and the GP has invested in each PC. It

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[2] When the EU refers to venture capital funds it tends to qualify its remarks by referring to funds that may exist as partnership or as corporations. The intention behind this is not at all clear. I have not found any research that addresses the issue of how many VC funds are partnerships and how many are corporations, though the literature implies that most VC funds are structured as limited partnerships.

will show the fees paid to the GP, along with various other items. For accounting and taxation purposes however, all of these all appear in the "real" accounts of each of the LPs and the GP.

The accounts of the GP are relatively modest compared to those of the LPs. They resemble those of a small firm. They will include the turnover of the GP from fees paid to it by the LPs, about €1M for a big fund. It will include the rent for its offices, the costs of travel and roadshows, and the salaries of staff[3]. Once all of this is paid, there is little else left in the fund. The idea that a part of any of this should be included in calculating the size of an SME is clearly mistaken and obviously an unintended consequence of the rules for defining the SME.

The BS of the GP will also include the GPs shareholding of the PC in this case 1.2%. So, including any part of the balance sheet of the GP in calculating the size of the PC is at best a case of double counting, but arguably inappropriate and clearly an unintended consequence of the rules for defining the SME.

On this basis, following the EU definition of the SME, the impact of on a VC backed SME should be relatively small, much smaller that suggested by a loose definition of a fund which considers all partners to be somehow "linked" although they are formally and by nature independent, and treats the PC company as being part of a single enterprise that includes the GP, the LPs and all of their portfolio companies.

There certainly are ambiguities in calculating the control that a VC fund might exercise over the PC. This can be an interesting subject for discussion. The real issue is the purpose of this control. This is examined in more detail elsewhere in this paper. It is highly unlikely that the purpose of such control might be the misdirection of funds provided by a research program to fund the research activities of the PC.

It would be useful to clearly understand what the European Commission intends to avoid with the use of the SME definition as it refers to issues of autonomy, ownership, and control. This is nowhere clearly stated and so, in an effort to get an insights into this, this paper looks at what can go wrong, both in the corporate world in general and in the specific case of the complex web of relations and interests that link portfolio companies with their GPs, LPs and investors.

The PC has no access to the staff of the venture fund, no access to its turnover, and no access to its assets. It makes no sense to count this as part of the PC. It makes no sense to double count the shares of the PC as being both apart of the assets of the PC and part of the assets of the GP. Counting any portion of this as part of the PC appears at first sight at least to be a violation of common sense. To decide if this is true, it would be very useful to have clear ideas, about

- The kind of problems the EU definition is intended to avoid
- The kind of companies that the EU definition, as part of industrial and RDI policy is intended to support
- Why and how in these cases, it makes sense to add up to 100% of the personnel, assets and turnover of a company's parents, subsidiaries, affiliates or other associated entities in order to compute its size, and estimate the pool of resources upon which it can draw to stimulate its own growth.

[3] The average headcount for a GP is of the order of 7 people

Annex 4: The LP-GP Relationship

VC Funds are managed by VC firms. These funds are generally structured as limited partnerships, structures that require a GP (General Partner) and at least one LP (Limited Partner).

The GP has sole responsibility for the day to day running of the fund and has unlimited liability. The limited partners are not involved in the day to day running of the fund and their liability is limited in the sense that they can lose only as much as they invest in the fund. Most importantly they cannot be attacked (in law) by disgruntled founders of portfolio companies or unhappy employees of the GP.

Lawsuits can be very costly and are a huge distraction from ordinary business. They also have a big impact on the reputations of those involved and can significantly impact the business of investing or raising money, for those that get tied up in one. Nevertheless, they do happen and although the general wisdom is that they are rare, academic studies suggest that they are much more common that industry actors would like to pretend. They amount to a catastrophic break down of trust and a failure to settle issues by other means, for example by negotiation.

The Swiss industry associations SECA[38] and SFAMA[39] have therefore developed model contracts to govern relations between the partners of a collective investment vehicle such as a venture capital fund. The template is available for free on the SECA site.

Many of the features of the LP-GP agreement resemble those of a normal company agreement. They include provision for a governing and executive bodies such as

- The Company Meeting, comprising the LPs and the GP
- The General Partnership AG, the fund management company
- The Regulatory Auditor / Financial Auditor.

The agreement clarifies that the LPs have no management powers, and that Management is delegated to the general partner (General Partnership AG aka the fund management company). The agreement specifies that General Partnership AG is responsible for the operational business of the Company within the framework of this Agreement. It evaluates potential portfolio companies, structures, and decides on the investment of the Company in the said. It constantly monitors the portfolio companies, specifically with regard to their achievement of set parameters (milestones). It is entitled to intervene in the management of the portfolio companies at its own discretion and, among other things, to take up a position on the Board of Directors of the companies in question. The agreement contains governance provisions for routine decision making. For example, the SECA model makes provision for an advisory board which will represent the interests of the general partners. The general partners may attend meetings of the advisory board but have no voting rights. Many of these provisions are designed to create distance between the LPs and the portfolio companies so that they can preserve their status of "limited" partner. The SECA agreement stipulates that decisions on a range of issues that are not explicitly delegated to General Partnership AG will be decided by majority vote at a company meeting. The LP-GP agreement may contain many other details such as the list of tasks delegated to the GP as well as the list of decisions on which GP and LP votes are required.

An important provision which is quite normal in the VC world is one which allows the Limited Partners to invest directly in the portfolio companies. These separate investments allow an LP to invest more than the pro-rata amount foreseen in the LP-GP agreement. It will also allow them to exercise more direct control, based on the terms of the separate agreement they have with the portfolio company.

In exchange for this work it will receive a fixed remuneration of X% of the total capital as well as a share of the profits, usually referred to as the carried interest[4]. Once again this is a model and reality is more nuanced. LPs complain a lot about the fees they pay to the GP and do everything they can to reduce them. This may mean reducing the 2% to 1% or somewhere in between, as well as a applying phased approach to paying out carried interest based on performance criteria and applying claw-back provisions if performance is considered poor.

SECA was instrumental in the introduction of the structure of limited partnership in Swiss legislation. In collaboration with SFAMA, the Swiss Funds & Asset Management Association, it has drawn up a model prospectus and a company agreement for the limited partnership used as a basis for collective investments. This model is accepted by FINMA, the Swiss Financial Market Supervisory Authority, as a basis for VC/PE funds to apply for authorization[40]. The model agreement is published by SECA website[41].

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4 The X% is usually 2% and the overall remuneration formula is referred to as 2+20.

Counterintuitively perhaps, whereas the LPs have the money, it is the GP that makes most of the decisions and wields power, not only over the portfolio companies, but also over the LPs. The agreements or contracts that link LPs and GPs and govern how they work together in the context of a fund, contain provisions for the monitoring and control of the portfolio companies, for example by giving access to accounts and reports on "reasonable conditions." But other mechanisms exist that provide LPs with greater discretion and levels of control over portfolio companies, than suggested by a simple reading of model contracts, such as those proposed by the Swiss industry association, SECA. The two main mechanisms are the "side letters" and the possibility of "co-investment" where an LP directly invests in a portfolio company in parallel with any investment made via the VC fund.

The side-letter is an additional agreement between the VC fund and one of the LPs, that effectively gives that LP more favourable treatment than that given the others.

The main LP-GP agreement describing the relationship between the LPs and the GP, usually gives each LP the right to invest directly in a portfolio company, alongside the VC fund. This will allow the LP to invest more than is foreseen in the pro-rata provision of the LP-GP agreement. It may give the LP a seat on the board of the portfolio company, independently of any seat or seats provide to the VC. It may also give it greater oversight into the affairs of the portfolio company, and greater control over its management.

A 2012 post in PE Hub[42] refers to the rifts that "side letters" and "separate accounts" are creating between LPs. A strong desire on the part of larger LPs to be in the driver's seat when it comes to the terms and conditions of a partnership agreement that will last of the order of 10 years, has led to the increased use of side letters and separate (aka "segregated") accounts.

- Side letters in particular are used to reduce fees paid to the HGP or even obtain a waiver. GP fees typically follow some variation of the "2+20" formula, whereby the GP gets an annual management fee of 2% of the amount under management, plus 20% of the profits made from investing. This is quite a substantial amount and it is easy to understand why LPs would try to bargain to reduce those costs. Some GPs will try to use the side letter as a way to encourage a large LP to commit greater amounts of capital.
- Another mechanism called the separate account effectively provides for variation on the investment strategy of the core fund, what is in effect a customized investment program tailored to the needs of the favoured LP.

Over the years there has been a tug of war between LPs and GPs over the issue of control. The issues addressed include management fees, investment strategy as well as the selection, monitoring and control of the portfolio companies. The edge in negotiating these issues passes like a pendulum from LPs to GPs and back. Right now, in the light of the COVID pandemic, things are swinging back in favour of LPs, which currently tend to favour working with the most experienced VC fund managers and eschew young less tested fund managers.

LP-GP Agreements

The key to understanding a VC fund is the partnership agreement linking the LP and the GP. It is important to recall that a VC fund is not a company, but a set of agreements linking a number of partners that agree to invest together, where a single partner is made responsible for the management of that overall investment activity.

A lot has been written about this process and about the agreements that bind those partners. This includes helpful guides put together by financial advisory firms such as Citi Alternative Investments[43], as well as much more exhaustive and comprehensive works put together by law scholars and academics. Some of the most recent and comprehensive texts include "Venture Capital in Europe" by Gregoriou, Kooli and Kraeussl[44] and "Private Equity and Venture Capital in Europe 2nd Edition, Markets, Techniques, and Deals" by Stefano Caselli and Giulia Negri[45]. These give a comprehensive overview of the industry and its practices in Europe and internationally. Anyone interested in the details of contracts including examples and discussions of competing interests and inter-partner dynamics should also consult "Venture Capital and Private Equity Contracting" by Cumming and Johan[46].

Although the LP delegates all responsibility for management of the investment process, and relations with the portfolio company, to the GP, the relationship between GPs, LPs and portfolio companies is much more complex than this picture suggests.

Tensions in LP-GP relations

The main task linking GPs and LPs is the selection and funding of portfolio companies and managing their progress towards an exit event. This is not the only issue that binds them. The LPs monitor the performance of the GPs and GPs want to start work on raising new funds as soon as they can. So, there are issues of agency and moral hazard that affect communication between these two actors. In a nutshell the GPs use delay as a tactic in managing their image, reputation, and the perception of their performance by LPs. This is a subject that has received a lot of attention from certain groups of researchers. The status of which is summarized in a 2018 publication by Chakraborty and Ewens[47]. These authors find that venture capitalists (GPs) take actions unknown to their investors (LPs) which are not always to the benefit of the LPs and may become a source of tension. They conclude that "fundraising incentives have real impacts on VC fund investment decisions, which are often difficult for LPs to observe."

AIM13, short for Alternative Investment Management LLC, is a New York based investment firm with over $1B currently under management. It markets itself as having a style whereby it invests its own assets along with client money, and carries out "on-going" due diligence, not just initial due diligence. In April 2019, it published an open article to the industry where it calls for LPs to be more accountable[48]. Although this is obviously a way to advertise its own services and its own style of management, it describes how LPs are being short-changed in their relationship with GPs, and criticizes what it sees as a laxness in the industry whereby LPs are not paying enough attention to the fine details of the contracts they have with GPs. The article is interesting because it very publicly denounces recent contracting practices by GPs and lists 16 issues with current practice where the contracts are unfairly tilted in favour of the GP, consequently eroding the interests and margins of the LPs. It provides an interesting illustration of the kind of tension that can arise in the complex network of relationships and interests that link SME portfolio companies to their GPs, LPs, and LP-Sponsors.

Litigation against VCs

Thanks to the GP-LP structure of a fund, when litigation occurs, it is usually the VC that gets sued, either by the portfolio company or by someone working for the fund.

A fairly recent but very high-profile case of where a VC fund has been sued by a disgruntled employee is the case of Ellen Pao against Silicon Valley based VC firm, Kleiner Perkins[49]. This gender bias case was covered extensively in the press at the time and although she lost her case against Kleiner Perkins, some think that this has set the stage for many more cases of this kind in future.

There are cases of one VC founder suing another[50] as in the Binary Capital case of 2019. It sometimes happens that VC funds may sue their portfolio company[51] for breach of agreement.

The phenomenon of a VC management firm (GP) being sued by a portfolio company is relatively rare due to the high cost it imposes on the PC founder. Furthermore, damage to the reputations of both founder and VC can be significant and affect their ability to do deals in future. Nevertheless, Vladimir Atanasov et al were able to study a sample of 296 lawsuits involving 221 VC firms during the period 1975-2007[52].

A more recent case that is currently gathering momentum is that of the We Work founder Adam Neuman[53], founder of WeWork, against Japanese VC fund management firm Softbank, for "abuse of power" and alleged breach of agreement to pay Neuman $3B in relation to his leaving the company he co-founded.

Although it is not a realistic option for most founders, things can go wrong in their relationship with their VC backers. The We Work story involving its founder Adam Neumann and Masayoshi Son, the founder of Softbank, is arguably the one that made the most headlines in recent times. Neumann is not a first-time founder and the compensation he had been promised was eye-watering. This was just the last instalment of a long saga that had much of the world gasping in disbelief. In this case Neumann filed a lawsuit against SoftBank alleging the investor breached its contract with WeWork by walking away from a planned $3 billion secondary sale. It is also a story of Softbank pulling back from alleged promises of huge and highly questionable payments to Neumann as part of that secondary sale. This has been widely covered in the media, most recently by the FT[54].

But this is not the only story. Tech Crunch also tells about activist investor Elliott Management inserted itself into a separate startup lawsuit this week, reportedly agreeing to financially back interactive video specialist EKO in a suit accusing Quibi of stealing a key piece of technology for its recently launched[55]. There is money to be made from lawsuits and so it is not uncommon for entrepreneurial law firms (in the US) to invest in "pro-bono" work with a view to sharing in the gains. Wherever there is money, misunderstanding, innocent

mistakes, sharp-practice, and sometimes even criminal intent can lead to litigation even between such highly unmatched opponents as the PC and its VC backer.

Because of the relatively passive role of the LP in the partnership, it is rare for trouble to arise involving the LPs. But it can arise. Usually this takes the form of a 'default,' a failure for the LP to provide the GP with funds needed to conclude a deal or honour existing agreements (to pay tranches for example) with portfolio companies.

A default can have negative impacts on both the GP and the other LPs, not to mention the portfolio companies. So, when it happens, it is the GP that wields power. The GP may in extreme cases, file a lawsuit to collect the unpaid capital contribution, interest and costs, and reimbursement with interest at the default rate.

Erosion of Trust by Founders in VCs and by Founders and VCs in PE

Recent trends include the erosion of trust in in the VC + PE, not only by the founders of portfolio companies, but also by the partners of smaller funds. The behaviour of giant funds such as Soft Bank has been cited in this regard. They have been accused on aggressive behaviour towards the prospects and founders they come in contact with, behaviour such as the sudden withdrawal of term-sheets and non-respect of (informal) agreements, forcing portfolio companies to merge or otherwise act against their own interests. The behaviour of Softbank in particular has been described by VCs as "a disaster" for the founders they have been working with[56].

In March 2020, John Plender of the FT wrote about "the seeds of a corporate debt crisis."[57] Among other things he discussed the risks inherent in very high levels of corporate debt, the way that risk has been building up for many years and the possibility of a crash being provoked by the fall-out from events such as the Corona virus pandemic.

Kate Burgess also writing for the FT observes that whereas interest rates for corporate debt have been very low, they have only been low "for those who can get it," a reminder of the fact that much of the corporate need for credit is not at all served by market[58]. Pitch Book's "2019 Global CVC Report" shows a significant trend in the growth of deals done and cash raised by corporate VCs[59]. Pitchbook has also written about growth trends in VC and PE[60]. Elsewhere it questions if this trend can continue based, among other things, on what it sees as the un-sustainability of the very high and increasing valuations of VC backed companies[61]. This issue is at least one factor being the decline in preference for the IPO as an exit mechanism in favour of the trade sale.

A recent collaboration between Deloitte and Pitchbook has resulted in a report entitled "Road to Next" written in January and February 2020. It delves into "expansion stage" finance in some detail looking at the state of the art and exploring how it might change in the coming years. This is the stage that ends in "exit." The figures they provide on the number of exits, the breakdown by type (IPO, Buy-out or Acquisition), sector and valuation are interesting due to the clear trends that they display[62].

Although these points may seem anecdotal, there is a growing literature on this topic in the business and general press. It is very hard and arguably even foolish to try to guess how these markets will evolve over the next ten years. Nevertheless, there may be simple lessons to be learned from all of this debate. That the worlds of VC and PE investing as well as the world of corporate lending is in a fragile state right now, and that this could make conditions difficult for start-ups in the near future.

There is increasing concern about the possibility of a liquidity crunch that will affect SMES, start-ups and HGEs in terms of the health of their clients and consumers, as well as in the health of those who would normally play the role of investor either in stocks or bonds or as providers of corporate credit.

Andrew Woodman of Pitchbook has recently written about the risk that coronavirus poses for the private debt market[63].

Kate Clarke a reporter for Tech Crunch, specialized in venture capital and starts-ups, has written in more detail about the impact of the Corona Virus outbreak on VC fund raising and start-up finances[64]. In a follow-up interview by Tom Dotan of The Information 411[65] she explained how Sequoia is referring to this as "the Black Swan of 2020" and how VCs more generally are advising their portfolio companies to "batten down the hatches", "plan for a down-turn," "cut back on hiring" and "have a plan for dealing with the impact of Corona Virus on their business." VCs expect not only a slow-down in business, but also a slow-down in fund raising. Clarke said that although things are not at the stage where VCs are saying "I could not raise a round" or "my fund is not close," many involved in fund raising expect progress to be slow. She referred to one fund (Seattle

based Madrona[66]) that has started to hold a daily conference call with its 80 portfolio companies to discuss the Corona Virus and talk about what other companies are doing to protect themselves from a downturn.

Although the overall sentiment appears to be that the VC sector will continue to rise in importance in the coming decade in terms of the number of deals, the amounts invested and the valuation of venture backed companies, there are many caveats.

The main message from these observation is that access by VC-backed enterprise to the SME programme may in the future play a role that is far more significant than the one it has played to date.

Annex 5: The VC-PC Relationship

The Nature of VC Control over its Portfolio Companies

A term sheet is a nonbinding agreement provided by the GP to founders of a PC, laying out the basic terms and conditions under which an investment will be made. It provides a useful summary of the most important points, one that is free of the legalize that a formal contract might contain. Y Combinator has developed a model for a Series A term sheet that fits on a single page[67]. Organizations such as the British Venture Capital Association and the Swiss Venture Capital Association have developed their own models, which are longer but still reasonable by in terms of their length. The term sheet also provides a useful starting point from which to develop more detailed legally binding documents. These include the shareholders agreement, the investment agreement, and bylaws governing how the board operates. Once the parties involved reach an agreement on the details laid out in the term sheet, a binding agreement or contract that conforms to the term sheet details is then drawn up.

The Investment Agreement is a legally binding contract between the investors and the company, its founders, and existing shareholders. It covers things like adherence clauses. It also provides the investors with rights to information need to monitor progress of the company and the growth (or decline) of their investment. For example, it will contain clauses to ensure that the investors will have access to company reports and accounts. It may also flesh out important details of the payment of the investment to the company, for example based on a schedule of "tranches" whereby the investment is released to the portfolio company, in phases based on the achievement of agreed performance goals. It may refer to investment warranties, to ensure that the directors' statements about reaching agreed targets are real and not imagined or exaggerated, that they have not been hiding bad-news or some 'surprise' that the investors really need to know about. Over the year's VCs have developed many mechanisms that allow them to manger performance related risk and find ways to manage differences of opinion between founders and their VC backers.

The shareholders' agreement will address in more detail the rights and obligations of all shareholders. It might outline how the board operates and takes decisions such as the appointment of directors. It might list "important" matters and describe explicitly how decision making with respect to those matters should take place. It might distinguish between the different rights and obligation of different categories of shareholders and how many of each category need to vote in what way to decide don important matters. It is worth noting that the idea of 'one share one vote' is at best an approximation and for that reason attempts to equate ownership with control as the EU definition of the SME appears to do, is not an accurate reflection of reality, certainly not in the case of VC-backed start-ups and HGE.

GP Capital Commitment and Control by Tranche

In 2017, Jia and Wang[68] write about the relationship between a GPs capital commitment and VC fund performance. They report that GP investment in portfolio companies, has a positive impact on exit success. They also find that this effect is more pronounced where there is less monitoring by LPs.

There is no doubt that investors in a HGE have a high level of control over the company in which they invest. This is so independently of the number of shares they hold. An important instrument of control is their control over the flow of money. All decision-making relating to the flow of money will be taken by the VC based on the performance of the company, those dealing with its day-to-day management and their ability to meet agreed targets. The arithmetic is simple, and without the money provided by the VC, the company is dead in the water, unless it has a good credit position and is able to generate good cash flow, in which case it may not need the VC to start with.

It should be clear that this payment-by-tranche mechanism, which affords the investors a significant measure of control over when and why payments are made to the PC, is a significant tool of control that investors yield, and this independently of the amount of shares they hold.

Model Contracts, Agreements, and other Resources

Europe Invest (formerly the European Venture Capital Association) publishes occasional studies, as well as handbook of professional standards. It also provides training. Most of its resources however are not generally accessible, being reserved for members only.

The NVCA or National Venture Capital Association[69] provides and makes freely available, a wide range of model agreements[70] for use by GPs and LPs in the US. The US Angel Capital Association does the same[71]. It also provides a model term sheet[72] for use by alliances of business angels.

SECA, the Swiss Private Equity & Corporate Finance Association[73] is the representative body for Switzerland's PE, VC and corporate finance industries. One of the aims of SECA in providing such models is to facilitate follow-on investment and ensure that start-up deals, do not create problems later on. Together with outside experts, it has therefore drawn up two sets of model documentation as guidance for its members and as a starting point for the development of agreements between GPs and their PCs[74]. One set (Model Documentation "light") is intended for use by business angels and start-up investors for investments in the range of 0.5 to 5 Million CHF[75]. The other set (Model Documentation "large") is aimed at institutional investors and investments in the range of 2 to 20 Million CHF[76].

Understandably, founders would rather have control of the board. They often have a strong vision of how the company should develop, and they want to retain control allows them to see this through. In particular they usually want to avoid a situation where the founder can be fired by investors. It is often the case that the talents of the founder as an innovator do not transfer to those of a business manager, and founders may have to change role, ceding power to others with greater knowledge and ability in key aspects of the business. This is a delicate issue for many reasons and part of the skill of the investor is to work with a founding team where the need to fire a founder is very unlikely. A VC will normally have neither the time nor inclination to micro-manage a portfolio company. On the contrary, it has every interest to make sure that the managers grow into their role, do their job well, and are seen by future investors or acquirers as assets that enhance the value of the company.

Although they will not play a role in day to day management of the company, GPs will have a position on the board, and they will need to maintain control over key aspects of the business, most importantly in order to fulfil their duties towards the LPs.

All of these arrangements are formalized in a set of documents that include

- The Term Sheet
- The Investors Agreement
- The Shareholders Agreement
- The Board Regulations and articles of association.

From the point of view of the control that the GP wields over the PC, the Term Sheet will outline high level issues relating to board control and voting rights. In particular it will refer to

- The size and composition of the board
- Veto rights on the financing or sale of the company
- The possibility when needed, of blocking or dictating operational decisions

The Board Regulations usually specify the duties of board members, and the manner in which decision are made. The board may distinguish between two categories of director, the investor directors, and the common shareholder directors. These have different status and different voting rights. Typically, the duties of the board include

- Determining the organization of the company
- Managing the company and issuing directives
- Appointing key staff

As a member of the board, the GP has a say in all of this. Normally it is not possible for a GP to impose costs, activities, or actions that other members of the board do not agree with. On the other hand, as the provider of the money that keeps the business running, its view has considerable moral weight even in cases where it occupies a minority position based on votes.

Many aspects of a typical VC-PC agreement favour the VC represented by GP, which must respect its legal obligations towards the LPs…

- The investor holds preference shares, that are senior to common stock
- It may buy them at a discount and sell them at a premium

- It may obtain a dividend that is higher than that issued to holders of common stock
- It may charge the company fees for advisory services in relation to the deal
- It will have a place on the board of the company
- It may be remunerated for its work on the board
- It may have a veto on the structure of the board
- It may have power of veto over key appointments
- It may have power of veto over the use of funds
- It may have power of veto over operational budgets and business plans
- It will have the right to inspect the accounts and reports of the company.
- It will have the right to withhold investment tranches if targets are not met.
- It will have power of veto over any revision to the schedule of investment tranches

Board Composition Ownership and Other Tools of Control

The activities of a company are supervised by its board, whose powers, duties, and responsibilities are determined by

- Government regulations and corporate law, as well as the
- Constitution and bylaws of the company.

There is in reality a lot of flexibility in how a company is controlled, and this can be summarized under the heading of corporate governance. A publicly listed company is subject to much more rules and regulations than a private company, mainly to do with reporting and transparency and with a view to protecting the interests of shareholders, who are not privy to the details of what goes on inside the company.

There is scope for flexibility in how key decisions are taken. These rules are generally laid out in a document that describes the functioning of the board and precisely indicates the rules to be followed in taking important decisions. Depending on the kind of decision being made, a decision may require a majority of all board members or a majority of those present at a meeting. It may follow the principle of one person one vote, or one share one vote, or it may follow some differentiated system whereby the holders of different classes of share may have voting rights that vary from no right at all, to one ordinary vote to any number of ordinary votes. Furthermore, not all board members are owners or shareholders in the company. Some directors will be employees of the company, some owners and some will have no relationship beyond a paid advisory role.

It should be clear from this sketch, that there is a complex relationship between the composition of the board, and its relationship to both the ownership and control of a company. There is also a significant body of research on this issue, such as recent work by Zhou, Fan, An and Zhong looking at the monitoring function of independent directors and their impact on performance related pay[77]. I cite this example to show a result that seems at first sight to be counter-intuitive, but which confirms an intuitive view suggesting that "owners" are better than "controllers" in terms of their impact on firm performance.

There are many interesting yet fragmentary results in the literature. It is hard to say to what extent they depend on culture. It is really hard to say what the sum of such findings imply for the concept of SME independence except to say that the relationship between ownership and control is very complex and that the assumption implied by the current EU definition of SME independence whereby ownership is equated with control is not a fair reflection of reality.

Control Structures, Voting Rights and Dual Class Shares

Work by Wang, Zhou and An, in 2016[78] looked at factors that determine the choice of control structure in hi-tech VC-backed startups. They found that the use of joint control structures, such as a mixed board with both VC and founder-management representation, were more likely to arise where the VC has stronger bargaining or the entrepreneur company has greater financing needs, as well as when the entrepreneur has high private benefits from the venture, and the VC cost of monitoring is high. They found that this is not the pattern outside the hi-tech sector, where the need for joint control is less apparent.

Although it is often seen as an important principle of good corporate governance, the idea that one-share should provide a shareholder with the right to one vote is not without exception. Shares that confer the right to one vote on the holders of such shares, are referred to as "common stock" in the US and "ordinary shares" in the UK. In general, there is no requirement in law for all shares of a company to confer the right to one and only vote on the shareholder.

A 2005 ECB research paper[79] explores a trend whereby publicly listed European firms, which once created dual class shares in order to raise capital without exposing the firm to the possibility of a takeover, are now moving to a single share class ownership structure. The author notes that although the value of such companies tend to increase after unification, other forces such as the desire to separate control from cash-flow rights tend to reduce the likelihood of unification.

It is interesting to note that such analysis makes no distinction between traditional and high technology companies, VC backed, and non-VC backed companies, or the tension between the wishes of founders and those of their backers.

Public stock exchanges impose rules of corporate governance on the companies they list. These include requirements related to the nature of issued shares and the possibility of listing with "dual class" shares with what are known as "weighted voting rights." The term dual class refers to a system which provides for ordinary shares and several other kinds of shares with what are called preferential voting rights. The motivation for having such different rights are many and easy to appreciate.

The subject has elicited considerable debate in recent years. High technology companies in particular, have a preference for dual class share structures, which provide a tool to manage tensions between the needs of founders and the needs of investors. They therefore prefer to list on public exchanges which allow the listing of companies with dual class share structures. A notable exception has been the Hong Kong stock exchange, which missed out on listing of Alibaba in 2016. Its founder Jack Ma listed instead on the NASDAQ as this would allow him to retain control of this company via a dual class share structure[80]. Hong Kong started to list companies with weighted voting rights in 2018. It is interesting to note that this option is only made available to "innovative" companies which it defines rather broadly as accompany for which (among other things) "research and development is a significant contributor of its expected value and constitutes a major activity and expense."[81] Exchanges that used to insist on companies adopting a single class share structure are now considering a change to listing dual class companies in the expectation this will help them win IPO contracts for technology companies, boost trading volumes and profits for the exchange.

Many of the public exchanges in Europe allow for dual class share ownership. The result is a complex relationship between ownership and control of companies. In Sweden for example, 80% of companies employ a system of weighted voting rights. The figure for France being 55%, the Netherlands 42% and Finland 40%.

Institutional investors often lobby against the use of dual class share structures[82]. They claim that such structures "create unequal voting rights and deprive shareholders of the means to hold executives and directors accountable." In an article dated 2018, The Council for Institutional Investors, point to the case of the Snapchat IPO in 2017 where the investors did not receive voting rights[83].

There is an age-old debate as to whether or not there should be a "law" to guarantee the principle of one share one vote in corporate governance. The closest there is to such a law is a requirement by some stock exchanges that listed companies should eschew the dual class share structure, also known as a WVR system of Weighted Voting Rights, in favour of a single class of common stock that bestows the right to one vote equally for each share held.

The main purpose for listing dual class shares is to provide the founders with a higher level of control for a lower level of ownership. Founders usually have big dreams and a clear vision for the development of their company. They can easily find themselves in conflict with investors "who just don't get it." The main reason that technology companies issue dual class shares is to allow the founders retain control of the company they created. Another reason is to provide early investors, who bear the highest risk with respect to investment in the company, with means to intervene to preserve the value of their investment, and avoid their stake being overly diluted either by the actions of the founders of by other follow-on investors.

Common stock which is offered to anonymous or institutional investors and traded on a public exchange, often comes with no voting rights. Other classes of stock may provide better voting rights, higher dividends, or privileged treatment in the event of liquidation. Common examples given to illustrate the practice include the case of

- The Ford family owns about 4% of the company's stock but controls 40% of the voting rights

- The CEO of Echostar Communications holds 5% of its stock yet controls 90% of the vote
- Google issued class B stock to founders and executives at IPO that gave them 10 times the voting rights of the class A stock issued to the public. It is worth noting that Google also issued a third class of share, class C shares, for its employees
- WeWork founder Adam Neumann once possessed class A shares with 20 times the voting power of other shareholders.

Supporters of dual class share structures say that these enable founders to provide determined leadership by placing the long-term interest of the company over the near-term financial results. It helps founders retain control over the company by reducing the threat of takeover.

Those who oppose the idea argue that such arrangements allow small groups to maintain control, whereas those who provide the majority of the capital have to bear a greater share of the risk.

Other models have been suggested for example structures which introduce place placing a time-bound restriction on such structures and allowing shareholders to accumulate voting interest over time.

Another possibility is provided by the LTSE model, which proposes the introduction of a governance requirement on listed companies whereby voting rights are weighted by the amount of time a shareholder has held a share.

Eric Ries referred to the need to create a new social contract. He is not alone in doing so and joins a chorus of voices talking not only about founders' rights, but also about the rights of workers and other stakeholders, the proponents of ESG and the green transition. What is most innovative and unique in the approach of Ries and the LTSE is that by building in new governance requirements into the working of this new public exchange, it now becomes part of the work of the SEC to police those new requirements.

This opens up new and interesting paths for innovation in the organization of the financial system.

A research report on the phenomenon of IPOs of companies with dual class share structures dated July 2019[84] found that innovative technology companies are key contributors to the wave of IPOs for companies with weighted voting rights (dual class share structures).

The editorial board of the Financial Times[85] has argued that dual class shares should be given consideration. Until now UK exchanges have been reluctance to list companies with multiple share classes. Their argument is that this gives some investors voting rights that are disproportionate to their economic interest, an argument which clearly ignores the interests of founders and early stage investors. The FT article refers to the case of Hong Kong which made the switch in 2018, a related debate that has re-started in the UK, and related actions being taken by the Spanish government to consult on the merit of such a change.

This ability to list public companies with dual class share structures is an important factor contributing to the US remaining a destination of choice for the listing of technology companies.

One of the main motivations for the use of dual share structures is that it affords protection against take-over and enables founders and early stage investors to retain control for longer periods over the company they started. It was widely adopted in the context of takeover battles of the 1980s, a time of asset stripping and predatory behaviour by investors made famous via films such as Wall Street.

Far from being a black and white issue of dual class shares being good or bad, it seems that the motivation for and impact of dual class shares, changes over time. There is also a related issue of the public interest, where the issue of the locus of control pits the interest of the long-term visionary leader against the short-term interest of the market whose profits feed into the reserves of social insurance funds and the nest-eggs of private pensioners.

The FT (among others) suggest that the weighting of shares should ideally vary with time, and contain something of a "sunset clause" whereby the rights afforded to founders, managers, and early stage investors, which enable them to pursue plans with time horizons extending beyond the next quarter, gradually converge with those attached to ordinary shares traded via public regulated exchanges. They suggest that at the very minimum, any two-tier structures should have sunset clauses built into them, based for example on fixed time limits. Evidence has shown that any initial positive benefits of loyalty shares erode over time. There should be a middle ground between a founder's focus on the long term and investors' insistence on clear governance. The FT points to a 2018 article published by the US SEC[86] providing evidence that the value of companies with dual class stock tends to erode over time.

Annex 6: The Difference between VC and PE

There can be no question as to the importance of control of PCs by their VC and PE backers. However, the intent and means of control is very different for these two groups of investor.

It is worth reflecting on the difference between PE and VC. Despite a tendency for some academic writers to conflate the two and treat them as equal, the difference is real and important for understanding the dynamics of venture capital and issues of control of portfolio companies.

Both Private Equity and Venture Capital funds invest in private companies as opposed to companies listed on a public exchange. Both tend to be structured as limited partnerships using the GP-LP model. In this sense VC is a sub-sector of PE. Pitchbook provides a useful overview of the industry, how it is organized today[87] and how PE relates to VC[88].

The Difference in Size

According to Crunch Base[89], a total of $1.4T was invested by the VC industry in the period 2010-2019. The best years were 2018 and 2019 with total value of closed deals at $322B and just under $295B, respectively. Those figures correspond to a total of 31,931 deals in 2018 and 32,776 deals in 2019.

It is interesting to compare this to the PE industry which closed a total of 26,500 deals in 2019 with a total value of $850B. The biggest deal of that year was the 100% acquisition of Nestlé Skin Health for $10B. Now has over $4T of assets under management and expects to exceed $5T in 2021.

PE as an industry has been on a strong growth trajectory. The 2020 Prequin Global Private Equity & Venture Capital Report explains that globally 8,400 institutional investors now invest in PE. The industry now has:

- 18,000 fund mangers
- 3,524 funds
- The 20 largest funds account for 45% of all committed capital.

So, PE is a distinct category of activity. It is a much bigger industry than that of VC. Yet the two are very closely linked. To understand what is happening in the VC world, it's role in the growth of the economy and the nature of the challenges it faces, it is important to understand the difference in what they do, how they do it and how they are linked.

The Difference in What They Do

Venture Capital tends to focus on start-up and early stage companies. It tends to take a minority stake in order to leave room for follow-on deals. It has evolved rapidly over the years in terms of the value added it provides to start-ups and early stage HGE.

PE tends to take majority ownership of, and exercise much greater control over, the companies in which they invest. Whereas the main concern of VC is to identify and develop high potential start-ups, the main goal of PE is to extract profits from these investments for itself and for the institutional investors whose money they manage. There is no doubt that the focus of PE tends to be on short term results, and some of the behaviours of PE can be described as predatory. But the companies they invest in are no longer start-ups and many feel that it is up to the PCs themselves to defend their own interests.

The intention of a VC fund is to identify and nurture innovative new ideas and leadership teams that may one day become global players and attain valuations that are 10s to 1000s of times greater than that which was invested in them. The benefit this creates for society is to guarantee the existence of creation of a dynamic, competitive economy based on the emergence of innovative new companies, the creation of new opportunities for jobs, as well as making available to the general public, the innovations needed for social and economic progress. The "problem" that VCs solve, is the problem of working with embryonic businesses (start-ups), and with founders that have no business or even life experience upon which to build, or in markets that have yet to be created and which are poorly understood if at all.

The intention of a PE fund is to transform or accelerate the growth of proven companies, and to optimize the return on investments they make in those companies on behalf of their clients, which include pension funds and insurance companies. The "problem" that the PE industry solves is the problem of putting to work the vast reserves cash built up by institutions that play essential roles in modern economies, such as but not limited to pension funds and insurance funds. PE takes their money, makes it work by investing it companies and

projects, and returns it with interest so that they can pay out the pensions they have promised to retires, or compensate the clients for the losses they have insured.

Clearly, there is great scope for confusing the roles of the PE and VC industries, not least because PE and VC funds tend to be organized on the basis of a limited partnership, involving several LPs that put up most of the money and play a limited role in the day-to-day management of their PCs. In both case a single GP puts up a small amount of the funds to be invested and assumes responsibility for essentially all investment related management tasks on behalf of the LPs. Further confusion is possible because to a good approximation, the same LPs put up money for investing by both VC and PE funds. The big picture is that VCs create a regular supply of new companies in new markets and domains for future acquisition by PE funds. This is where the similarity ends. VC and PE funds are very different in nature, though similar in structure. Though they are inherently complementary, conflict easily and often arises between the immediate needs of the VC and PE funds, by virtue of the LPs that lie behind them.

Over the years the VC community has been highly inventive and creative in finding ways to better fulfil its role. These innovations are briefly summarized in "Annex 8: Innovation in VC Financing Models and Exit Strategies" dealing with start-up financing, start-up growth and on entry-to-exit start-up pipeline innovations.

The Impact of PE on the Economy

The PE industry has also been very creative in its approach to investing, and in the way in which it generates cash flow from the companies it invests in. Its impact on the economy is described in some detail in the work of Josh Kosman[90], a well-known private equity, and mergers expert. He is business reporter at The New York Post, a senior writer for "The Deal," a senior reporter for "Buyouts Newsletter" and former editor at "Mergermarket.com."

The same theme is pursued by Rana Faroohar, associate editor at the Financial Times, CNN's global economic analyst and former writer for Newsweek and Time Magazine, in her book entitled "Makers and Takers: The Rise of Finance and the Fall of American Business." In this, she describes what she refers to as the "financialization of business" a process in which companies are aggressively optimized in both strategic and operational terms, for the benefit of top management and major shareholders. She describes how companies have been made fragile by the aggressive extraction of resource by managers and shareholders, preventing companies from building up the reserves they need to provide resilience in bad times, and reducing their ability to invest in research and innovation. Furthermore, the aggressive extraction of profits by PE, deprives their PCs of resources which could be used to pay workers a decent wage, finance the decarbonization of their activities or navigate the green transition. When those profits are not available, companies increasingly borrow to pay management bonuses and dividends. The result is a worrying rise in the existence of "zombie" companies, that is companies whose annual debt repayments are greater than the profits they are able to make from normal business activities.

This phenomenon of the fragilization of companies has recently become every pertinent due to the impact of the COVID-19 lockdown on the revenue streams of very many companies, and their ability to pay rents, salaries, and the interest on borrowings. Lacking reserves, having been "optimized" to provide investors with maximum returns, they have been obliged to raise money by issuing debt in the form of corporate bonds. In many cases, the bonds issued by companies that until recently would have been considered investment grade, are now rated "junk" and many commentators are worried about what might happen if they start to default on their coupons.

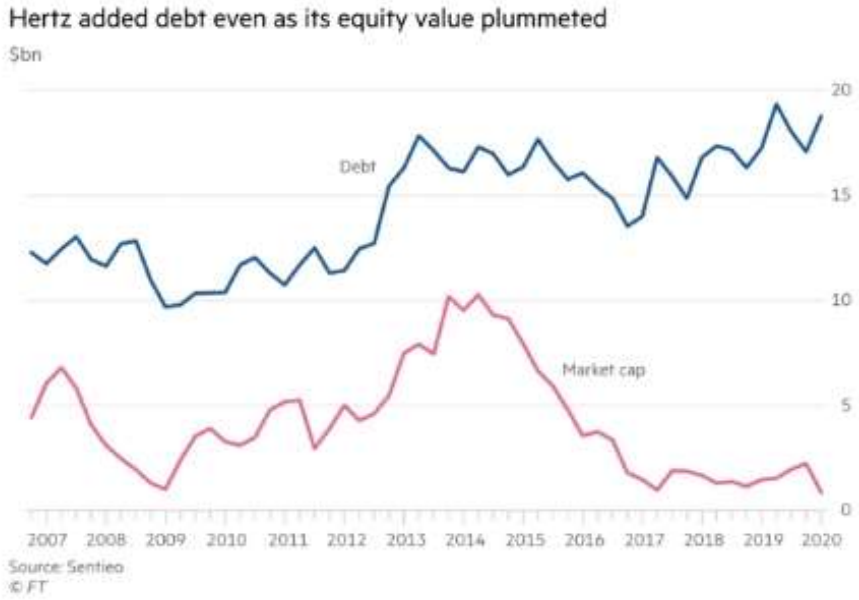
The consequence of such fragility has been noted by Marc Andreessen, founder of one of Silicon Valley's iconic VC funds. In an essay[91] published on the blog of his VC fund Andreesen Horowitz, entitled "It's time to build" he captures a moment of frustration with "the system" and was covered widely by financial journalists and in trade magazines such as TechCrunch[92]. In it he talks of a need to "demand more of our political leaders, of our CEOs, our entrepreneurs, our investors. We need to demand more of our culture, of our society. And we need to demand more from one another. We're all necessary, and we can all contribute, to building."

The Case of Hertz

Mark Vandevelde of the FT[93] provides an interesting history of how the use of corporate debt has evolved since the oil embargo of 1973, which led to a fourfold increase in the process of oil in countries such as the USA. Hertz the car rental company responded to this by borrowing heavily to replace its fleet with smaller more fuel-efficient cars, better able to meet the needs of its clients than those of its competitors. The move proved very successful and led to an increase in turnover and profits for Hertz in the following years. Hertz,

filed for bankruptcy in May 2020, laying off 38,000 workers, citing COVID-19 as the main cause of its demise. Vandevelde points out in his article that at the time of filing, Hertz had $17b in debt on its books, and that after 15 years of "aggressive financial engineering," it could no longer borrow from the markets and owed over $12.4K for every $10k car that it owned.

The evolution of Hertz's attitude towards debt is very well summarized in this graph, which I "quote" from the article of Vandevelde. It clearly shows how its market cap of Hertz closely tracked its overall level of debt until about 2014, and how a totally different dynamic took over where its market cap started to decline while debt just kept on piling up.



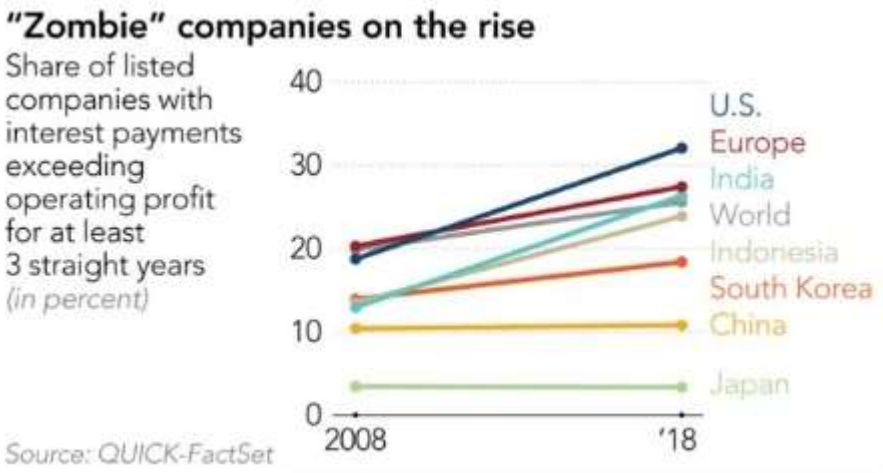
In telling this story, Vandevelde refers to Michael Milken, the invention of junk bonds and the explosion in the use of LBOs[5] that have effectively put the fate of corporations and their employees in the hands of PE funds (more precisely buy-out funds), whose primary concern is not the acquired company or its employees, but the extraction of rents from that company in order to satisfy their own needs and those of their clients.

The Corporate Zombie Phenomenon

In August 2019, Tomohiro NOGUCHI, a staff writer for the Nikkei Asia Review, wrote of the threat that the rapidly rising number of corporate zombies posed to the to the world economy[94]. For those unfamiliar with the term, a zombie company is one whose profits are not high enough to cover the interest payments on its debt.

Based on Nikkei research on 26,000 companies around the world, they observed that in the decade from 2008 to 2018, the number of corporate zombies had risen to one fifth of all public quoted companies, and that the biggest increase had come from companies in the US and Europe. In 2008 the number of zombies in both the EU and the US was at about 20%, but by 2018 this increased to about 28% for the EU and 32% for the US.

[5] The point about the LBO is that it typically involves a process whereby investors borrow to buy a company, in such a way that the burdens of debt and debt service is born by the company being bought not by the investors who buy it.



Since then, Bloomberg[95] has written about the zombie phenomenon. This time in an article that speaks approvingly about how European industry seems to have weathered the fallout of COVID-19 better than its counterparts in the US, only to then point out the risk that Europe faces, of its bond buying programs bailing out "zombies."

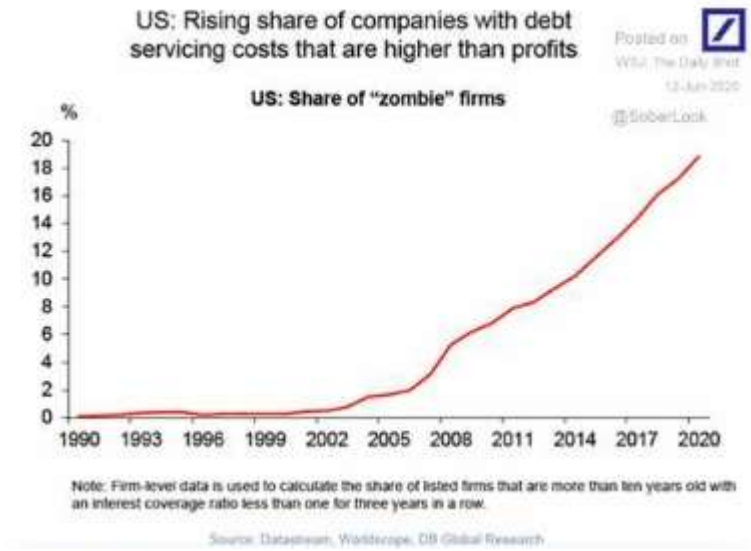
PE and the Public Good

Matt Stoller approaches these issues from the point of view of monopoly power and the risks attending what he sees as the excessive concentration of power in the PE industry. Stoller is a fellow at the Open Markets Institute[96], editor of "Big," author of "Goliath[97]" and commentator on the impact of monopolies in modern America. He recently wrote a piece entitled "The end of Private Equity is coming[98]," in which he refers to the work of Ludovic Phalippoua and of Eileen Appelbaum. His point is that PE has evolved to embody an extreme concentration of wealth and political power, that is leading to severe economic inequality, stagnant household income, the collapse of business formation and innovation, and historic levels of political polarization. His article draws upon recent work of Appelbaum and Phalippoua to make those points, and his message is very much consistent with the work of Michael Hudson[99].

Appelbaum, is a former Professor of Economics at Temple University, senior economist, and co-director of the Center for Economic and Policy Research in the US, and visiting professor at the School of Management, University of Leicester. She is an expert in private equity and labour relations. She is the co-author of several books including "Private Equity at Work: When Wall Street Manages Main Street" a book about the impact of PE on business[100]. She and her co-author write about how private equity firms' financial strategies extract maximum value from the companies they buy and sell, often to the detriment of those companies and their employees and suppliers. She covers similar ground to Phalippoua but in her interview with Matt Stoller, she raises the alarm concerning the efforts of PE in the US to get access to a pool of money worth about $6.2T of workers' retirement savings, that is currently sitting in their 401ks.

At issue are the stealth-like strategies that PE is using to get access to these funds. She maintains that PE is not transparent about its performance, that it is living of its past reputation, that in reality its performance has been in steady decline since about 2006, and that it currently provides returns that are lower than what can be obtained by investing directly in the stock market. She explains that PE firms have disguised their underperformance by changing benchmarks or by using inappropriate metrics like Internal Rate of Return. One of the factors contributing to lower performance is the eye-watering and fees that they retain from the monies vested, an issue about which there is little transparency and much discussion in the financial press.

Ludovic Phalippou is Professor of Financial Economics and Head of the FAME Group at Saïd Business School, Oxford University[101]. He specializes in private equity and asset management and in 2016 was listed as one of the 20 most influential individuals in private equity in Europe. He recently sent shock waves through the PE industry with a paper entitled "An Inconvenient Fact: Private Equity Returns and the Billionaire Factory[102]" that "struck at the heart of the modern private equity industry" getting immediate coverage in Financial Times, Bloomberg, Forbes, and Institutional Investor[103]. His paper focuses on the role of LBOs and corporate debt in modern economies, and the attendant rise of zombie corporations. His graph of the rise of zombies in the US is as follows and clearly shows a new dynamic kicking off in the period 2002 to 2005.



This begs the question as to why a company would allow itself to borrow more than it can service. The answer is simply that the PE firm that now controls the company forces them to take on such debt, aided by wilful blindness on the part of top management which tends to be well compensated through bonuses for under-performance, effectively transforming these businesses into limited liability shells that transfer money from the lenders to PE[104].

Phalippoua's paper analyses the performance of the PE funds (buy-out funds) that are behind the wave of LBOs and the rise of zombie companies and asks if this is good for investors. His conclusion is a resounding "no" or at least "not since about 2006." He found that LBOs did generate returns for investors better than you could find on the public markets before 2006, but afterwards those excess returns all but vanished. The reason being the excessive fees that PE funds were charging for the work they did. Ultimately, they took all of the excess returns for themselves and left little on the table for the LPs and other actors whose money they were being paid to invest.

His analysis is important because it cuts through the confusion and possibility for obfuscation provided by the financial crisis of 2008, and the ease with which large companies can borrow thanks to the low interest rates offered by central banks.

Since the COVID-19 pandemic has struck, a significant number of journalists have written about the egregious behaviour of PE backed companies, laying off large numbers of workers, including PE owned health care organisations laying off doctors and other healthcare specialists, despite the obvious need to maintain this essential workforce.

Elsewhere, I have written about the impact of PE on retail and commercial real estate[105], in particular a phenomenon identified around 2015, and referred to as the "retail apocalypse." This was partly a consequence of an aggressive PE strategy that involved

- Buying retail, restaurant, and bar franchises
- Loading them with debt to finance the rapid expansion of outlets
- Selling their real estate and other assets to PE owned leasing companies
- Leasing those assets back to the acquired companies at the maximum price they can bear.

A consequence of this strategy was to deprive them of the ability to establish reserves necessary to survive bad times, so when pressures accumulated, the companies lacked the resilience needed to survive and were forced into bankruptcy. Around 2015, this started to happened on a massive scale with 1000s of stores closing down in the US and the UK, press coverage mainly focused on the damage done to real estate due the sudden and irreplaceable loss of commercial rents. This was yet another case of what Michael Hudson refers to as PE "killing the host" and another case of phenomena covered by Nicholas Nassim Taleb in his book entitled "Antifragile[106]."

Andreessen, Appelbaum, Faroohar, Hudson, Phalippoua, Stoller and Taleb are part of a growing chorus of writers and commentators, journalists and hard-core economists discussing how the role of PE has evolved

over the years, the trouble that is being stored up for advanced societies and economies, and the need for a seismic shift in the nature and role of PE in order to restore a healthy balance to the world in which we live.

Although this discussion has an overtly US orientation, these trends affect the EU as well. They are in any case pertinent for the EU on the basis that business practices that become normalized in the US, are often adopted with a time-lag by peers operating in the EU. Furthermore, the US experience provides EU policy makes with foreknowledge and wisdom of how far a 'system' of importance to the economy and society, when left to itself, can lose touch with the clients and broader society it is supposed to serve.

Annex 7: Impact of VC Ownership on Research, Innovation and Growth

To understand the challenge of reformulating the definition of the SME, it is useful to view this from the point of view of the challenge of SME growth, the financing of such growth, the players that intervene in facilitating such growth and the natural tensions that arise between them. In particular between the finance-hungry growth-oriented enterprises and the many other actors which aims to profit from their growth. We are talking about the relationship between founders, their start-up companies and the funds that will help them grow, between the portfolio companies, their VC and PE funds as well as the GPs and LPs of which these are made.

Relationship between VC Backing and Research

The issue of the relationship between a company's investment in research and VC backing is a hard one to unpack. It seems quite natural that a VC will take an interest in a company that has been established to take advantage of knowledge or technology created in the course of publicly funded research. There is nowadays an entire "industry" of incubators and accelerators dedicated to helping in the transition from research to viable business activity. As a general rule, a VC with a focus on early stage enterprise is interested in companies that have unique products or services, protected by patents or hard to acquire know-how. In particular it is interested in companies that already show commercial potential in the sense that the company has established a product-market fit, is generating some income and has some kind of a sales funnel that provides insight into key business parameters such as the CAC and LVC.

A whole discipline has emerged over the last decade to help start-ups reach this stage of business maturity before they seek the support of institutional investors. Arguably the most important approach is the Lean Start-Up approach which emerged in Silicon Valley about 2008, and which has spread to most countries in the world, in little more than a decade. It is based on the observation that the start-up is not a smaller version of a large company, but a specific phase in the life-cycle of a company, where the main goal is to discover a viable business model, which it will then scale-up and eventually become excellent at implementing. This approach is a fusion of the work of three people

- Eric Ries who coined the term lean-start up and developed a lean approach to business development based on the idea of eliminating waste (time and money) based on his experience in the application of lean management principles in software development
- Steve Blank who contributed the Customer Development Methodology based on fast feedback and has snice been instrumental in introducing the lean tart up approach in public administration
- Alexander Osterwalder who contributed the Business Model Canvas as a simple, visual, universally applicable way for structing thinking about how to construct and build a business.

It has and continues to evolve. It has been adopted and adapted by big enterprise, the military and public administration. It challenges intuitive and widely accepted ideas that start-up managers should spend time developing business plans, insisting that they needed to get out of the office, interact with possible clients and rapidly iterate on product-market concepts, "pivoting" after each iteration until they find what is known as the MVP or "Minimal Viable Product." It sparked a revolution in thinking about start-ups and challenged basic ideas of how companies are created and how they should be developed. It has had a profound impact on the way VCs view start-ups and small enterprise. It has changed expectations of what VC expect from a portfolio company.

The lean-start up method should be seen in the context of another revolution in thinking about product development in start-ups that dates back to 1991 with the publication of Geoffrey Moore's book entitled Crossing the Chasm[107]. This is essentially a re-invention of the "adoption curve" for modern times and technology-based start-ups. The adoption curve was first developed by agronomists about 100 years ago, based on their observation of patterns of adoption of new corn varieties by US farmers. It provides a segmentation of customers into categories such as pioneers, early and late adopters, and points out that the motivation for buying is very different in each segment. In particular it points out that the first customers may simply be the only customers, in that they prove to be just some crazy guys who will try anything that is new. How work is still relevant today and in 2014 the third edition of the book was released. In 1995 he followed up with another work called Inside the Tornado[108] which deals with the challenge of managing the ultra-rapid growth that modern companies sometimes experience.

The point being that the main concern of a VC backed enterprise is business development and market growth. The risks and challenges inherent in these are very significant and very different from the risk and challenges inherent in research or technological development. Most importantly the human qualities required to run a

business are very different from those needed to run a research project. They continue to evolve as the business evolves from being a start-up, where it does not yet know what a viable product-customer pairing will be, to one where systems need to put in place for rapid growth and efficiency.

A possible exception to this rule for the company that is "built to grow", is a certain kind of company that is "built to be sold." In his case the alignment that is sought is with a possibly limited number of companies that are seen as candidates for a future acquisition. Make no mistake, a company that has created a social technology, and hopes to be bought by Google or Amazon for example must do all the work needed to demonstrate a high level of user adoption. But one that has developed a drug or medical device, may be content to design the drug, guide it through approval processes and sell it to a company that has the where with all to assure its marketing and distribution.

Relationship between VC Ownership and Control, and RDI Investment

It is widely recognized that financial constraints are among the most significant barriers to the growth of entrepreneurial firms. They tend to be severely credit constrained due to the fact that they have weak revenues terms, no reputation and cannot self-finance. When they do access loans it tends to be at a high interest rate. So, venture capital is often the only way forward.

One of the earliest works to rigorously explore the relationship between venture capital, R&D, and innovation, was a by Kortum and Lerner study published in 2000[109]. Examining 30 years of industry data it provided evidence that industrial sectors which experienced an increase in VC activity also experienced significantly higher rates of patenting. This much-cited work concludes that the level of innovation in venture backed companies is much higher than that suggested by their investment in R&D. More specifically they estimate that whereas the ratio of VC to R&D investment in the US for the period 1982-1993 was of the order of 3%, VC investment may have accounted for 8% of industrial innovation in that period.

In 2000 Laura Bottazzi and Marco Da Rin[110] published research based on a data base of 400 firms listed on the Euro NM, a group of European exchanges established in 1997 with a view to supporting young innovative companies with high growth potential. Their database included data from company reports and prospectuses prior to and after listing, with a view to providing answers to questions such as

- What determines the likelihood of support from a VC fund?
- How does the company use the money they raise by going public?
- Do VC backed firms behave differently from other firms?
- Does listing affect the firm's ownership structure?

They found that the response to these questions was very heterogeneous across sectors and across countries, especially on issues such as the impact of venture capital on the firms decision to go public, on ownership structure and on other aspects of its decision making before and after listing. One of the reasons for the study was to determine how well the Euro MN was living up to its mission. From the point of view of this paper, their work illustrates the diversity of VC backed enterprise and the difficulty of making generalizations about such companies, beyond the fact that there are few other financing options and that the venture capital provides added value on the basis of its know-how and experience in business development and in managing the growth of new entrepreneurial endeavours.

In 2002 Helmann and Puri[111] provide evidence for the role of venture capital in the "professionalization of startups."

In 2004 Keuschnigg[112] supports the idea that venture capitalists add value to firms not only by financing their growth but by the provision of advice, in particular in the case of start-up entrepreneurs. He provides evidence to confirm that a productive and active venture capital industry boosts innovation-based growth.

In 2005 Ortega-Argilés et al[113] explore the relationship between ownership, control, research, and innovation in a study of the behaviour of companies in Spain. Their main finding is that a high degree of ownership concentration and the use of debt financing discourages investment in R&D, and thereby R&D outputs in terms of innovation.

In 2008 Large and Muegge[114] carry out a review of existing literature on the nature of non-financial value added by venture capitalists. They observe that apart from agreement on the general principle, little is known about the nature of value-added by venture capital or the way in which this is achieved. They conclude that whereas the main areas for VC added value is in terms of "operating, outreach, consulting, mentoring and

recruiting," the evidence is far from definitive. They propose an 8-category typology for evaluating the non-financial impact of venture capital success-on-exit as a basis for future work.

In 2016 Wen and Xia publish work based on post-IPO R&D investment by companies listed on the Chinese GEM over the period 2010 to 2014[115]. Companies listed on GEM tend to be SMEs that have difficulty accessing more traditional sources of finance such a bank loans, in particular for financing their research activities. The authors present evidence suggesting that venture capital has a positive impact on R&D investment, even in companies where there is a high level of ownership concentration (as measured by the share of the biggest shareholder). This work is a continuation of previous work published in 2008 that focused on manufacturing corporations over the period 2002 to 2008[116].

The Value Added of VC Board Members

An important way VCs provide non-financial added value to their portfolio companies is to serve on the board of directors. They may do so directly where someone from the GP sits on the board, or indirectly by appointing a director to represent their interests. In this way it is well known that VCs purposefully use the boards of their portfolio firms and that the boards of VC backed firms are more active than boards in other firms. It is well known and understandable that the goals and expectations of the two groups of directors, those who represent the founders or the managers of the portfolio company and those who presented the VC, can differ. Whatever the vision of the founders and goals of the founders and managers, the VC lives under pressure to secure a successful exit that will satisfy the other investors whose interest it represents. For these reasons, the board dynamics of VC backed companies is of interest to researchers.

Nevertheless, Gabrielsson and Huse[117] note that despite the large number of studies carried out on the relationship between VCs and their portfolio firms, research efforts were highly fragmented and few focused on the dynamics of the board. In 2002 they published a review of the available literature on the topic and attempt to go beyond board composition, to explore the board roles and processes of VC backed firms. Their findings include the following:

- The boards of VC backed companies were typically small ranging from 3 to 7 directors
- The number varied depending on which phase of development the venture was in
- It typically increased to 7 as the company neared IPO
- At this point the board tended to be dominated by VC appointees rather than management
- This was only partly due to a desire of the VC to closely monitor performance
- It also allowed the managers better access to expertise and networking resources.
- The outside directors tended to support managerial strategy rather than dictate strategy

Gabrielsson and Huse concluded that VC appointed directors serve as valuable resources for the founding entrepreneurs, and that their role went far beyond monitoring and control.

SERAF is a provider of software for early stage investors[118] intended to help them manage their portfolio companies. They also provide a lot of educational, training and knowledge resources for investors including templates for key documents such as term sheets[119]. In a four part series on the details of terms sheets they point out that "the individual provisions can be thought of as a group of tools representing a negotiated balancing or risk allocation between the concerns of the founders and the concerns of the investors in that basic area," and that these fall into four main categories:

- **Deal Economics Clauses** to make sure that their investment is worthwhile. So, they put in provisions to guarantee for example that they get paid back first, that employee options don't dilute them too much, and they put a time-clock on the founders because time is money and the return on investment is just as sensitive to 'when' you get it back, as to how much you get back
- **Investor Rights and Protection Clauses** to ensure that future financing deals do not contain terms which unduly diminish the value of their investment or cause them to lose control.
- **Governance, Management and Control Clauses** so that they know what is going on in the company, they have a say in critical decisions, and they protect themselves from founder behaviour that could be damaging to the company.

- **Exit and Liquidity Clauses** to maximize the chances that they get their money back in all possible exit scenarios, even if they have to force such a situation to occur.

The idea that investors need to protect themselves from founder behaviour is real. First time entrepreneurs tend to be inexperienced as managers, they may have poor people skills, they may have poor negotiation skills, they may confuse company money (which they have a duty to manage on behalf of all shareholders) with their own money, they may resent being questioned about their decisions and they may lack personal maturity, displaying big egos and an inability to react well to criticism or consider advice. Anyone who has invested most likely has encountered "crazy founders" at some point.

In terms of governance management and control, SERAF points out[120] that there are in general four principal ways that investors implement this: board seats, governance provisions, information rights and founder restrictions. But it is useful to delve into the details to see what this might mean in practice.

Annex 8: Innovation in VC Financing Models and Exit Strategies

The industry press reports on the continuation of a wave of innovation occurring in the way VCs themselves invest in and manage their portfolio companies, as well as in their preferred exit strategies. Some of the strongest trends relate to the creation of new debt-like instruments that will enable VCs to invest in a wider range of companies including those that are not very interested in becoming unicorns or raising large amounts of finance via the traditional VC route. Other strong trends related to the emergence of alternative exit strategies, intended to address the tensions that naturally arise between VC LPs and GPs and between VCs and acquisition hungry PE funds.

Problems with IPOs, Premature Exists and Quick Flips

Although it is generally observed that companies with VC backing, improve in terms of operations, governance and innovation, investors are under pressure to time exits in order to optimize its return on investment and may exit before a growth plan has been completed. A premature exit is often referred to as a "flip." Research exists which shows that when market conditions are favourable, they can double the rate of exit and increase the probability of a quick flip[121].

VC or PE firms tend to work under time pressure. Although 10 years, the typical life-cycle duration of a fund, sounds like a long time, the first 3 to 5 years may be spent in the search for and selection of a portfolio of investible companies. The remaining time of 5 to 8 years is spent preparing the portfolio company for exit. The main concern is not only that the portfolio company is ready for exit, but that the market is also ready, in order to secure for investors, the most profitable outcome. It is quite common for tension to arise between the founders and the investors in relation to the timing and method of exit. This issue is explored in a 2019 paper by Minardi, Bortoluzzo, Rosatelli and Ribeiro[122] where they examine the misalignment that can arise between the fund manager and the portfolio companies, albeit for the case of VC backed companies in Brazil, as an illustration of the limitation of the traditional VC funding model.

The traditional exit for a VC backed technology company has been the IPO. But there has been an increasing chorus of dissatisfaction with the IPO process, both from investors and from founders. The two biggest general issues being the high cost of an IPO, what investors see as shortcomings in the ability of the IPO to enable price discovery and the inordinate demands that preparation for an IPO puts on the time and energy of the founders and managers. For this reason, the exit options have proliferated and remain an on-going area for innovation in the overall investment process.

A variety of exit mechanism are referred to in the literature, these include:

- Sale to anonymous investors via an IPO
- Sale to anonymous investors via a DPO or Direct Listing
- Sale to a SPAC (special purpose acquisitions company)
- Trade sale to an acquiring company (M+A)
- Sale to another VC or PE actor (common in the case of angel funds)
- Sale to founders via portage (staged cash payments for return of equity)
- Write-off, often involving sale of assets to founders for a symbolic fee

In the not so distant future, exit mechanisms will include listing on the LTSE or Long-Term Stock Exchange.

The Professionalization of Seed, Pre-Seed and Sprout Phase Investments

Hunter Walk[123] is one of a small but growing number of fund managers that have taken steps to professionalize the seed stage of investing. He claims he "does not like venture" yet he runs a successful seed fund called Homebrew Ventures[124] now in its seventh year[125]. In his words "we started Homebrew because we saw that there was a lack of service being provided to founders." He claims that "for fundraising, seed is no longer a round, it's a phase[126]."

Elizabeth Yin[127], co-founder and general partner of The Hustle Fund[128], blogs on early and very early stage investing. In an article entitled "Pre-seed is the new seed" she reflects upon how this category has evolved over recent years[129].

Having said that, most funds and journalists reporting on the industry, still count "seed" as a funding round. Crunch Base refers to pre-seed and "sprout" rounds of funding in its Q4 Global VC report for 2019[130].

Nevertheless, a number of investors think of "seed" and "pre-seed" more as stages in a company's growth. As a general rule, start-ups that have not yet achieved product-market fit and the ability to scale, are not ready for seed capital. According to Yin[131], when a company is in the seed stage…

- It has revenue and clients
- It has done some kind of cohort analysis
- It is able to estimate (based on experience) LTV[6] and CAC[7]
- It has a sales funnel
- Typical seed funding is of the order of €5M

Until a company reaches this stage, it may be seen as being in a "Pre-Seed" stage. According to Yin, this corresponds to a stage in a company's life were

- They do not have traction
- They do not have revenue
- They do not have product-market fit
- Typical pre-seed funding is of the order of €0.5M

There appears to be an emerging cohort of relatively young, founder-friendly VC managers such as Elizabeth Yin and Hunter walk. Many of these VC managers have been founders and known from experience what it is like to be a founder and where traditional VC firms have been weak in providing support. They have a good feeling for the needs of pre-seed stage ventures in terms of advice and guidance and know that the needs of pre-seed stage businesses are quite different from those at the seed-stage. In this way, funds and fund managers have learned from the past and have started to set up dedicated seed funds, with VC manages that specialize in the management of investment in businesses in the very early stages of growth.

Tech Crunch wrote about the pre-seed trend already in 2018[132] stressing that "this is not a fad." Hunter Walk and Elizabeth Yin are not alone. Roger Ehrenberg also blogs about "building a seed stage venture firm"[133] and has interesting things to say about this emerging new category. Even large VC firms have started to invest in and develop funds dedicated to, businesses in the seed and pre-seed stage.

In May 2020, Sam Lessin for The Information wrote about the impact of COVID on seed stage fund-raising[134]. He emphasized how the valuations of early stage ventures were falling and how investors were demanding greater levels of protection. His main message was that it would only get harder for early stage companies to raise money under current conditions.

Nevertheless, it has not all been bad news. The new generation seed and pre-seed specialists that we have been talking about, have also been affected by the pandemic. Some have been quick to adapt and reluctant to hold back on funding. Seed Camp for example has been blogging about how it is investing in pre-seed stage companies having only ever met them online[135] and in June 2020 Sifted wrote about Connect Ventures[136] a London based VC that raised a third fund seed-dedicated fund worth $80M.

Direct Listings or DPOs

In the past, the IPO was seen as the preferred exit. Due to the increasing level of dissatisfaction with the IPO process, there has been increased interest in alternatives such as Direct Listings or the use of SPACs. The IPO involves the use of underwriters whose fees for an issue can come to hundreds of millions of euros. It also requires that a 180 day "lockdown" on company insiders, basically the founders, executives, and early investors, from selling their stock. The DPO is another mechanism, which, though not new, came to fame in 2018 when Spotify became the first ever technology company to go public in this way. Slack followed suit in 2019, and the DPO is now seen as an increasingly important exit strategy for late stage technology companies. A good overview of the process and the difference between an IPO and a DPO is provided by Jamie McGurk of Andreessen Horowitz[137], one of the investors in Slack.

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[6] A marketing term that stands for the Life-Time Value of a client or a customer

[7] A marketing term that stands for the Cost of Acquiring a Customer

A curious difference between what happens now and what used to happen two decades ago, is that a company listing used to be about raising capital. Many VC backed companies listing today however, already enjoy good cash flow and are profitable and may already have the cash they need to finance future growth, sometimes thanks to late stage mega-rounds in the age of the unicorn. The whole rational for listing is no longer about raising extra capital for the portfolio company, it is primarily about rewarding the investors and other shareholders such as the founders and managers with stock options. This brings us to one of the most important criticisms that investors have voiced concerning the traditional IPO mechanism, that it tends to under-price the shares of the company being listed. The underwriters have tended to offer the shares of the pre-IPO company at a discount, in order to stimulate interest, typically at a discount of 10% to 15%. This discount is money that the investors must forgo as part of the IPO process. In some cases, the discount has been much greater than 10% or 15% and so investors have been interested in mechanisms that price shares at closer to a fair market price. This is the main point of interest of the DPO approach. This and other aspects of the difference between IPOs and DPOs are discussed in a 2019 article by Ben-Tzur and Evans[138].

Deferred Listings via SPACs

Writing for the Journal of Private Equity in 2013, Ignatyeva, Rauch and Wahrenburg provide a useful overview of the history of SPACs since their emergence in the US in the 1980s to their first appearance on EU exchanges in 2005[139]. In particular they look at how SPACs in Europe are less tightly constrained by regulation than their US counterparts. They examine the drivers of SPACs in Europe and why they exist, how they are different from SPACs in the US, the performance of SPAC stocks and the kind of companies they target. Their exploration is quite comprehensive and covers for example, the ownership structure, who invests in them and their regional focus. Due to the resurgence of interest in SPACS reported by close industry observers such as Pitch Book, it might be useful to review their work and examine how all of this has evolved since the original review of Ignatyeva, Rauch and Wahrenburg was carried out.

SPACs have risen in popularity in recent years and provide investors with solutions to what they see as shortcomings of the traditional IPO or as a way to avoid the time-pressure created by a need to align IPO market timing with the traditional 10-year cycle of VC and PE funds. Instead of listing a portfolio company, the investor may list a Special Purpose Acquisition Company, intended to acquire that company, possible along with several others, at some stage int the future. The SPAC is listed instead of the portfolio company, whose shares may be available for purchase by the SPAC on favourable terms at a later date. The relationship between the PC and its VC, is replaced by one with the SPAC, one which might be consummated by acquisition long after the original VC fund has been dissolved. Pitch Book initially reported on this phenomenon in 2017[140] but has seen a resurgence of interest in SPACs in 2020[141], arguably as a way for managing the impact on COVD-19 on portfolio companies and the markets in which they operate.

The use of SPACs is not without controversy and in 2020 it has become a major topic for commentary in the financial and trade press. The Information recently referred to them as "blank cheque companies" in an article entitled "What Private Tech Firms Should Watch Out For in SPACs[142]." While acknowledging that SPACs "offer a new route for raising money that, unlike a direct stock listing, is faster than a traditional initial public offering," the article points out that not every SPAC is an ideal merger candidate. The article nevertheless goes on to advise on what a technology firms should look for in a SPAC, before deciding to go down that route.

Exit via the Long-Term Stock Exchange (LTSE)

Dissatisfaction with the role of the US stock exchange has been building for a while, often dissatisfaction with the short-term nature of trading and a perception that the system increasingly operates in ways that are detrimental to founders and investors, and also to innovation. As a solution to some of its woes, Eric Ries suggested the creation of a Long-Term Stock Exchange or LTSE in 2011 in the last paragraph of his book on the Lean Startup. In it he spoke of the need for a "new social contract." In 2016 Kevin Delaney of Quartz wrote about the efforts of Ries to make this happen[143]. In particular he highlighted new features of the LTSE. Although the LTSE and its listed companies would satisfy all of the normal SEC requirements needed to trade shares on US stock markets, they would also have to fulfil additional requirements such as,

- Disclosure requirements allowing companies to know who their long-term shareholders are and investors to know what investments the company is making
- Linking executive pay to long-term business performance

— Enabling "tenured shareholder voting power" whereby a shareholder's vote is weighted by the length of time the shares have been held

The request to create the LTSE was filed in 2018[144]. Permission was granted[145] and reported on in the Wall Street Journal in 2019[146]. A September 2019 interview[147] with Martin Alvarez, the commercial manager of the LTSE[148] explains that the number of publicly quoted companies has halved over the last 20 years, and that an increasing number of VC backed companies are putting off their IPO or seeking a non-IPO exit such as M&A (trade sale) or sale to a PE fund. What is most off-putting for innovative companies is the effort they put into quarterly reports and the focus of investors on short term results, prevents them from taking risks and investing in innovation. He also points out that the big winners from this stock market dynamic are big institutions and high frequency traders, and that this has happened to the detriment of small investors and pension funds, who reap less and less of the benefits of trading in the capital markets. The model of the LTSE is unique in that it provides start-ups, early stage and late stage companies with a range of tools to help them put in place the governance systems they need in order to pursue long term plans for innovation and have a higher impact on society, by what the LTSE refers to on its website as a "fundamental shift in the incentives of financial markets." The LTSE has not yet started trading. It was to start at the end of Q1 2020, but the start of trading has been postponed due to issues related to COVID-19. It is now expected to start trading in June 2020[149].

Private and Public Markets for SME-Bonds and Mini-Bonds

Bonds[150] are issued by organizations that need to raise money to finance their projects. The projects might include the building of infrastructure or the financing of utilities, as well as the purchase of equipment, the financing of market expansion or the financing of operations including research and technological development.

They take the form of contracts or IOUs in which the borrower (a.k.a. the issuer) promises to pay interest to the lender (bond-holder) at a rate that might be fixed, variable or floating, at given intervals over a given period of time, at the end of which (maturity) the amount initially borrowed is paid back to the borrower. Due to their tradeable, contractual nature, as well as due to the of the bond and the amount of detail and complexity that might be involved, bonds are often referred to as "securities," "bills," "notes," "paper." Specific categories of bonds are referred to as gilts, treasuries, T-bills. These are all bonds of one kind or another and are really just a form of debt.

Traditionally bonds are issued to raise amounts of money that are greater than those that can be raised from a single bank. Effectively this means chopping the debt into small pieces that can then be sold to any number of creditors. Bonds are also seen as a way for diversifying risk. Bonds can also be traded via a brokerage, either privately or publicly with all the transparency the law requires.

Bond issues cover a wide range of needs, including the funding of research and development. They are not dilutive and trade long-term debt for interest payments. In principle it is possible for VC backed companies to cover the interest payments from revenues or as an operating cost covered by VC financing contributions.

There are two types of bond market. The primary market is where borrowers issue bonds to lenders. The secondary market is where lenders and other actors trade these bonds with each other. The primary market reflects the availability of money to support development, whereas the secondary market reflects a much more complex system of confidence in the economy, the risk of default and dynamics of the financial services industry. The primary market is also referred to as the "new issues market" because it reflects the creation of new debt securities that have not previously been offered to the public. The secondary market is where pension funds and other structures buy up big chunks and hold or trade them with a view to making a profit.

Many sources provide an overview of the global bond market. A useful starting point is Wikipedia[151] which indicates[152] that the global bond market in 2017 was worth just over $100 Trillion in terms of total debt outstanding. This figure under-estimates the real value of debt because many bonds are not included in SIFMA figures. This figure is broken down into categories such as Treasuries, Corporate Debt, Mortgage Related, Municipal, Money Markets, Agency Securities and Asset-Backed.

Wikipedia puts the value of the corporate bond market at 21.75% of the total or just over $8.6 Trillion. More up to date figures estimate the size of the corporate bond market in the US as just over $9 Trillion on January 1, 2019[153].

In 2019 in the US, the value of all shares traded in the stock market was just over $30 Trillion. The total amount of debt owed through bonds was more than $40 trillion, of which just over $9 Trillion consisted of

corporate bonds. So as a rough rule of thumb one can think of the corporate bond market as being very big and roughly one quarter of the size of the publicly traded stock market.

One category of bonds is convertible bonds, where the contract includes an option to switch debt for equity. This is the equivalent of collateral in the real estate market, where in the case of a default, the lender obtains an asset in lieu of payment, in this case shares in the issuing entity.

Bonds are usually issued by large corporations, national governments, regions, or municipalities. However, they can also be issued by SMEs and in the period since the crash of 2008, there has been great interest in and experimentation with the development of a market for "SME bonds," also known as "mini bonds."

Some of this experimentation has been carried out by traditional lenders and exchanges. Some of it has been carried out by entrepreneurs operating in the alt-fin space, hoping to disrupt traditional financial service providers.

The disruptors include the UK Bond Network, a P2P lending platform launched in 2013, with a plan and a platform to tap-into the wisdom and financial resources of peer-to-peer networks of retail investors to streamline the bond-issue process. Typically, they aim to create a credit market for companies that need between €0.5M and €4M, or growth funding in the range of €1M to €20M. These financing needs are either unserved or grossly under-served by traditional banks.

A November 2010 INSEAD case study by Pierre Hillion, Jean Wee and Bowen White entitled "Dürr: Disintermediation in the German Mid-cap Corporate Bond Market"[154] which describes in some detail how the bond-issue and IBO was carried out. The article reports on how the initial idea launched in Stuttgart, has since spread to Frankfurt, Düsseldorf, Hamburg, and Munich, as well as to Paris. In particular it cited the listing of an SME bond by CAPELI construction company on the Paris EURONEXT (NYSE Alternext) in November 2012.

The early history of SME bonds includes the issue of bonds by Keijser Capital of the Netherlands in 2012[155] to cover SME lending needs of at last €25M.

A 2013 article in Forbes Magazine by Alvin Lee of INSEAD, refers to how SMEs can embrace the bond market[156]. He refers to the crash of 2008 and how smaller companies were at risk of being shut out of the corporate credit market. Against this background in 2010, the Stuttgart Börse created a special bond platform for SMEs, offering bond issues in the €25-€150M. Lee describes this "Bondm" platform created in 2010 as a "radical departure" from the traditional approach to bond issuance. It is innovative in that is allows companies to sell directly to retail investors in the primary bond market without going through an underwriter. This offers advantages for both the issuer and the investor (buyer/lender). The issuer goes through an IBO (Initial Bond Offering) after which the bond can be publicly traded on the Bondm market. When the article was published there were already 25 SMEs listed on the Bondm, whose combined assets come to €1.6B. This 2013 article describes how some of the companies have teetered on the brink of default, mainly in the renewable energy sector.

Research by Deutsch Bank published in early 2015[157] cautioned that SME covered bonds were "not yet" a rising star. More specifically they referred to bonds based on pools of SME loans. The DB paper lists the many advantage that such instruments might offer to investors, thereby helping to expand the availability of SME finance options. However, it cautioned that there remain important constraints on the development of this market, most notably in terms of

- The legal framework
- Investors' appetite and
- Banks' ability to supply these products

In November 2016, Susanne Schier head of the private investment team at Handelsblatt's Frankfurt finance desk wrote about "The Disastrous SME Bond"[158]. In the wake of a series of spectacular bankruptcies by SME bond issuers, she surveys progress in the German SME bond market and concludes that the results have been "disastrous." She quotes a study by the Capmarcon consulting firm indicating that investors have invested more than €6 billion in 144 Mittelstand bonds since 2010. According to their calculations more than 27% of the bond volume placed with investors is "performance-impaired." She quotes Scope rating agency which claims that 43 of the 144 Mittelstand bonds have failed, with 23.3% of issuers insolvent. Capmarcon also indicated that more than one in eight of the bonds outstanding at that time, were trading at less than 50% of their face value, with about half being quoted at between 50 and 100%, and some dropping to as low as 3%. Beyond saying that things are very bad, Schier provides little by way of analysis except to say (the obvious fact) that the SMEs that issued bonds had very poor credit.

It is interesting to note that whereas these bonds were invested as a response to the risk that SMEs might be excluded from the post 2008 credit market, the opposite seem to have happened in the sense that banks have been lending to companies with good credit ratings with interest rates as low as 2%. By comparison, the interest rates on bond issues have with interest rates that typically range between 6 and 9%. On this basis it seems only natural that the pipeline would contain only those companies that have much weaker credit profiles and have therefore been refused credit by traditional banks. At first sight it seems surprising that lenders were somehow unable to take this into account. Nevertheless, Schier does not offer any insights into this.

Schier refers to the Capmarcon study which estimates that about €400M in fees and commissions had already been paid to advisors by issuers. At first sights at least this seems high compared to the €6B of corporate credit involved. This suggest that arguably fragile companies with a high payback burden also have the added burden of high fees, suggesting a need to look into the role of agency risk and the possibility of what Michael Hudson[159] refers to "killing the host."

A 2017 article published in the Schmalenbach Business Review[160] entitled "The Issuance of German SME Bonds and its Impact on Operating Performance" refers to the performance of German SME bonds (also known as mini-bonds) issued in the period 2009-2010 and designed to address SME financing needs as low as €10M, down from the typical €100M threshold. The article refers to a large increase in the number of issues until the first defaults started to appear and issuance activity more or less stopped in 2014. It refers to the fact that at the time of writing (2017) "a third of all issuers were partially or completely unable to make coupon payments and/or to repay principal." The media was of the general opinion that the defaults should have been foreseen. One of the main points investigated by the article is the performance of rating agencies, in particular their over-optimistic assessment of credit risk, partly attributed to lack of experience with the sector. The article also deals with the impact of bond-issuance on SME performance. It remarks that many of the issuers suffered declines in operational performance, increased overall costs and a marked downswing in the aftermath of a bond issue. They report that this is in line with the general literature on performance of companies (non-SME) after a bond-issue. The article does not investigate the reason for this, or the nature of the link between performance and bond-issue. The article does not investigate the effect of sector or other qualitative SME characteristics such as phase (start-up, scale-up…) on performance. Other issues such as the need to retrain managers to help them to the higher debt service requirements have not been considered. Nevertheless, the results can be seen as optimistic in the sense that it implies that with experience and better tools of analysis, the assessment of risk could improve, along and consequently the design of the bond-issue, and the performance of related rating and advisory services.

Nina Trentman, writing for the WSJ[161] in 2017 referred to recent plans by Deutsche Börse AG, to revive the SME bond market. The article reports that interest in SME bonds increased after the 2008 financial crisis, when most banks cut off lending to smaller companies. In Germany for example, about 110 companies made use of the SME bonds since 2010. By 2014 there was a surge in SME bond defaults. Defaults in 2015 reached €164.7M and in 2016 they reached €889.6 million. One of the factors cited for the surge in SME-bond defaults was the lack of regulatory consistency, along with the fact that different regional exchanges (Stuttgart, Hamburg-Hannover, Düsseldorf, and Munich) all have differing requirements for the issuance of SME bonds. The article remarks that only a quarter of SME bonds are listed, the rest being traded OTC. Against this background, Deutsche Börse AG will introduce a "scale" segment to replace the old "entry" segment, it will impose more stringent qualitative conditions on the issuer and a requirement of at least €20M for the issue.

In November 2018, Stéphane Blanchoz, Head of SME Alternative Financing team at BNP Paribas, sees SME loans as a sweet spot in the bond market[162]. In his view "loans to SMEs can offer excellent returns, particularly to long-term investors such as insurance companies and pension funds, while also improving the diversification of their portfolio." He remarks that fewer than 1000 EU companies issue listed bonds… the rest go to the bank for finance or issue debt outside the market … private debt is in great demand, particularly when it comes to debt issuances worth between €40 and 60 million." He sees an important opportunity in SME loans between €500k and €5 million, amounts too large for the crowd funding market, but which banks are also no longer keen to lend." He referred to a, SME Alternative Financing strategy, to be launched in the UK early in 2019, with a target capital of €300M, in which BNP Parisbas will take a minority stake. His ambition is for BNP Parisbas to reach an SME lending rate of over €1B per year across Europe.

According to Blanchoz, the cost of issuing SME bonds can be restrained through standardization. (aside … perhaps on a project by project basis, for example for local energy or green economy projects, perhaps even

for cooperative ventures with stable cashflow, or otherwise able to cover the cost of interest payments in their "mark-ups".

Surveying the press and related literature since 2008, one can see a steady evolution in SME related bond markets (or bond market experiments). These include the issue of bonds by financials based on the pooling of SME loan portfolios, as well as the issue of bonds by individual companies for amounts that have descended from €100M to €20M to €10M to €500K.

In February 2020, the OECD published a study[163] on "Corporate Bond Market Trends, Emerging Risks and Monetary Policy." This study is mainly interested in monetary policy, but it examines among other things the negative effects of an economic downturn on the non-financial corporate sector, in the context of an overall decline in the "quality" of debt, in other words the risk of default. Since 2008 the annual issue of corporate bonds is at about $1.8 Trillion per year, twice that which occurred in the period 2000 to 2007.

A small number of studies and research papers exist on the subject of SME bonds or mini- bonds, the main ones cited in Research Gateway being:

- "Risk and Pricing on the Italian Minibond Market" in the book "Frontier Topics in Banking" by Alessandro Grasso and Francesco Pattarin, May 2019, DOI: 10.1007/978-3-030-16295-5_2
- "Mini-Bond-Backed Securities: A Breakthrough for Italian SMEs?" by Mario Lupoli in The Journal of Structured Finance Spring 2019, 25 (1) 31-42; DOI: https://doi.org/10.3905/jsf.2019.25.1.031.
- "Financial policy of Italian SMEs: The impact of mini-bond" by Maria Serena Angelini Alessandro, Maria Serena Angelini, Gennaro Alessandro and Renato Giovannini January 2019, Corporate Ownership and Control 16(3):113-128, DOI: 10.22495/cocv16i3art10
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- "Le condizioni per la diffusione dei minibond" a working paper by Loris Di Nallo, Emanuele Renzullo and Fabio Cortese, July 2016, DOI: 10.13140/RG.2.2.29573.14564.
- "First-Time Corporate Bond Issuers in Italy" by Matteo Accornero, Paolo Finaldi Russo, Giovanni Guazzarotti and Valentina Nigro, January 2015 in the SSRN Electronic Journal, DOI: 10.2139/ssrn.2609309
- "The Lehman Minibonds Crisis and Financialisation of Investor Subjects in Singapore" by Karen P. Y. Lai March 2013 Area 45(3), DOI: 10.2139/ssrn.2260127
- "Financial Marketing of SME Bonds (Finanzmarketing einer Mittelstandsanleihe)" by Jacob Kleinow, October 2011, SSRN Electronic Journal, DOI: 10.2139/ssrn.1978376

This research could be extended looking at publications in academia, which might provide insights from the US market for corporate bonds.

There are a number of articles dealing with the so-called "Lehman minibond crisis" of 2008. This was a clear case of the mis-selling of HK 20B worth of complex products to unsophisticated investors. It is a cautionary tale, and the tenor of the most recent article is to ask if the lessons have been learned or if mini-bond markets may be setting up for collapse. Its significance tis that many countries put in place legislation to limit the selling of mini-bonds to retail investors as a protection against mis-selling by the likes of Lehman. This may or may not prove a barrier to entrepreneurial innovation in the SME financing space.

The Kleniow article from 2011 is in German. It includes a summary of interviews conducted with 57 German SME bond issuers, as well as a view on the future of the SME bond market.

Other than that, it seems useful to interview Stéphane Blanchoz of BNP Paribas to see if his optimism has persisted through 2019 and 2020 and to get his views on the prospects for minibonds in the coming years.

Alt-Fin Experiments in Lowering the Cost of Bond Issues and IBOs

Just as with IPOs, an IBO (Initial Bond Offering) requires preparation (with the help of advisors and underwriters) and incurs significant costs before the issue can be listed on a public market or even for the private (OTC) market. Typical issues include regulatory costs related to a bond issue, which in the UK ranges from £100K to £1M when legal fees are taken into account. The goal of some of the Alt-Fin plays is to reduce these costs, aiming for example to get them down to a minimum of £50k or a maximum of 1.5% of the capital raised[164].

The Alt-Fin sector is an increasingly important sector of entrepreneurial start-up activity. In the UK alone it includes "The UK Bond Network" which launched in 2013 but seems to have closed up shop in February 2019. It also includes "Funding Circle," "Lend Invest" and "Wise Alpha." All somehow targeting the market for corporate loans in the range £500k to £20M, using mini-bond or related instruments.

The Alt Fin sector is still embryonic and small by any standards, at least in Europe. Nevertheless, it is worth watching as it represents alternative forms of finance for smaller companies including SMEs. Forms of finance that are non-dilutive, that may be accessed to cover costs of RDI, to which access may be enhance for VC backed companies.

It is also possible that ventured backed companies might have superior credit profiles due to the "adult supervision" provide by their VC backers.

Venture Debt and the Equity-Debt-Equity Funding Model

In 2019, Wu and Zu published work looking at the performance of SME loans to VC backed companies in China. They see the combination of debt + equity as positive for SMEs that obtain this mix of investment. Their main findings are that

- VC backup can effectively improve SMEs' access to bank loans, especially short-term loans, at lower costs, and loans without collateral.
- VC backed loans are also less likely to default and positively related to SMEs' performance, mainly by reducing the information asymmetry between banks and SMEs through both "hard" information of better-quality financial statement and "soft" information of SMEs' creditability.

They consider that combined debt-equity financing could be a "meaningful new ingredient in the financial infrastructure of the largest emerging market."

Recent academic work on the role of venture debt in Europe includes case studies examining the trade-off between debt and equity and decision-making process of the owner-manager. The same authors examine finance options including debt, equity and retained profit for companies through their start-up, growth, and expansion phases.

Work from 2012 on venture debt suggests that contrary to the case for public firms, venture debt predicts poorer future firm performance across several dimensions. The findings include the observation that taking on VC backed firms that issue debt (bonds) have a lower chance of success via IPO, that firm valuation falls after debt financing and that inside venture debt (loans made by the VC) leads to a significant drop in share price value compared to VC backed firms taking on external debt.

A 2009 study by Darian M. Ibrahim explores the phenomenon of venture debt which he describes as a "puzzle" in that loans are given by VCs to rapid-growth start-ups, with no track records, positive cash flows, tangible collateral, or personal guarantees[165]. He asks questions as to why they take on venture debt rather than equity. He lists the advantages that his provides from a portfolio company and VC point of view. He refers to benefits predicted by "capital structure theories" after the first round of VC funding. He concludes that VC backing and intellectual property substitute for traditional loan repayment criteria, make venture debt attractive to a specialized set of lenders. The abstract implies that by 2009 the practice is already quite widespread and of the order of "billions of dollars in loans each year."

Other relevant work includes "Venture debt financial instruments and investment risk of an early stage fund" by Szymon Kwiatkowski[166].

Work by Indraneel Chakraborty and Michael Ewens published in 2015 refers to VC backed firms that switch from equity to debt. It refers to this event as "rare" but observes a consequent important drop in valuation, lower probability of successful exit and a deterioration in firm quality. The authors do not interpret this as a

negative correlation between the issue of venture debt and firm performance, rather they see the role of debt as maintaining incentive alignment after an adverse shock to firm quality.

Work by Gaétan De Rassenfosse and Timo Fischer, started in 2012 and completed in 2016, examined the lending decision criteria of 55 venture debt lenders in the US. Among other things they note that venture debt limits equity dilution at one stage in the life of the venture, but that it prolongs the runway, allowing entrepreneurs and investors to raise equity at the next funding round at a higher valuation.

They also note that venture debt lenders prefer to lend to start-ups that offer warrants, affording the possibility of swapping debt for equity at a later stage. The authors maintain that venture debt already plays an important role in new venture financing. They claim that (in the US at least) about $1 of venture debt is provided for $7 of venture capital invested.

Their work nuances the overall picture of the lifecycle of a venture backed company, where the traditional (simplified) narrative focuses on venture capital in exchange for equity in the portfolio company. Their work suggests that an alternative route mixing venture debt and equity whereby

- A first round of equity financing helps the startup to reach revenue
- A round of venture debt where interest ideally is paid from this revenue "prolongs the runaway" and helps the company position for a second round of equity financing
- The company then raises a second round of equity financing when it is in better shape and at a higher valuation

They nevertheless state that venture debt is often issued to a venture backed company with no revenues and no tangibles assets. They conclude that the possibility of raising venture debt is a rationale for a company having VCs on board and raising a first round of financing.

Aside: How many start-ups and entrepreneurs are aware of the equity + debt route and are able to request this in their negotiations with VCs or use this as a strategy for (among other things) avoiding being excluded from SME research and innovation funding programs. In principle at least it seems possible to convert equity to debt in order to preserve the possibility of participation in the SME program, then converting debt to equity at a later stage. Doing so could provide benefits to both the investors and the portfolio-company. The conversion of equity to debt could be seen as a new category of SME-bond issued for short term needs such as participation in the SME program.

John B. Vinturella and Suzanne M. Erickson write about venture debt in a book entitled "Raising Entrepreneurial capital" published in 2018. They discuss the role of long-term and short-term debt and examine how "top entrepreneurial companies" use combinations of debt and equity to finance their growth depending on which is the most advantageous for the particular stage of growth they are in.

Other work on these issues includes that of Jesse Davis, Adair Morse and Xinxin Wang, "The Leveraging of Silicon Valley: Venture Debt in the Innovation Economy,"[167] and that of Yuki Amemiya, "Convertible Debt with Costly Communication in Venture Capital Finance."[168]

Venture Capital 2.0 and the RBI Spectrum

The term "VC 2.0" comes from the blog of Jamie Finney a partner at Greater Colorado Venture Fund and Kokopelli Capital. It refers to new and emerging founder-friendly dilution-free products that help VCs to take on promising start-ups in a competitive "market" for access to the hottest new founders and their ideas.

The relevance for this study is that while competition for new ideas is pushing VC and PE funds to invest in new entrepreneurial ventures at an ever earlier stage, exposing their portfolio companies to the risk of exclusion from SME programs, these new products may help them portfolio companies avoid the exclusion altogether, due to their non-dilution of founders' shares.

Examples of such innovations include:

- The Y-combinator SAFE[8] contract simplify and speed up investment in early stage ventures. The SAFE is designed as a replacement for the convertible note, an agreement whereby money is lent to a company with an option to convert the debt to equity at a later date. Y-combinator explains in its blog[169] the advantages it offers over the convertible note. The main advantage for Y-combinator is that it provides a new way to invest at the idea stage that makes seed investing

[8] Simple Agreement for Future Equity

faster and easier. This is an important issue in places like Silicon Valley where big investors, VCs, Pes, and corporates compete fiercely to get early access to the hottest prospects.

— RBI[9] products, where debt is issued to VC backed firms but on terms that are more flexible than ordinary bank loans. In these cases for example, interest payable may be linked to a % of revenues rather than to a % of the amount borrowed. This kind of debt-based instrument appeals to founders for many reasons and a number of VC funds have emerged that intend to base their investments exclusively on the use of RBI products. These include

- Lighter Capital (https://www.lightercapital.com/homepage-redux/) which promises "Zero dilution. Keep your equity, board seats, and vision intact. 100% transparent process. No hidden fees. No personal guarantees or warrants. Quick and easy access to up to $3M capital."
- Indie.vc (https://www.indie.vc/)
- TinySeed (https://tinyseed.com/)

David Teten, writing for Tech Crunch in 2019, compiled a list of 24 of the biggest RBI based funds[170] so the cases listed above are just a small sample to illustrate a growing phenomenon.

The Quartz article considers that these funds all look likely to succeed and validate the model. Nevertheless, it does not see RBI as suitable for companies looking for large amounts of capital. It considers that the RBI trend will grow but will remain a niche in the overall scheme of things.

Jamie Finney of Greater Colorado Venture Fund and Kokopelli Capital has blogged about RBI investing in Medium and refers to RBI as part of a VC 2.0 eco-system that includes many risk capital Structures, of which RBI is only a part[171]. In a separate article[172] he points out that the trend is in fact quite diverse in its manifestation and that there is in fact a great deal of innovation by VC funds in order to create investment products and services adapted to companies with different needs, in particular for companies whose founders don't explicitly intend to get acquired or go to IPO.

So, remarks about the future of the RBI sector based on a small number of examples may lead to an under-estimation of what is to come.

Another relevant trend is the rise of interest in public venture funds or GVC (Government Venture Capital). The literature on this is mixed. In some cases, the authors assume that these are the results of ill-conceived efforts by governments to recreate local versions of Silicon Valley. In many cases however, these funds are a response to a market failure to ensure that perfectly viable and even socially desirable projects are ignored by VC simply because they do not promise the high returns available from projects needing finance elsewhere. For this reason they are often referred to as "opportunity funds" and the poster child of the family includes those public funds that were instrumental in the turnaround of Detroit in the last decade or so. It is arguable that the EU Green Deal will create similar needs across the regions of Europe, that such companies may need money for research and development to adapt general solutions to the specificity of the region. On that basis it may be prudent to anticipate the possibility of such companies being denied access to the SME instruments and requiring special treatment or consideration as a result. Hence the reason for including its mention here.

[9] Revenue Based Investment

Annex 9: The Social and Economic Role of Start-Ups and SMEs

Start-ups and SMEs play an important role in the modern economy. They are

- Creators of employment
- Efficient providers of necessary products and services
- Sources of competitive pressure for established companies
- Vehicles for technology transfer and the commercialization of RDI results

Nevertheless, they lack the reserves, reputations, and credit histories of large established companies, and so it is difficult for them to grow organically on the basis of their own resources.

They are the target of a great many policy measures and programs, at national and regional level. These provide them with assistance in the form of privileged access to funding for research and innovation, soft loans for expansion and growth, often guaranteed by the state, favourable tax treatment, as well as set-aside for public procurement.

Nevertheless, they are badly understood. Despite their best efforts, academics have not yet been able to develop general theories of the small business growth, adequate to generally inform policy.

The need to support small business growth and development is arguably greater now than ever. Not only due to the devastating impact that COVID-19 is having on EU and world economies, but because of the way in which the world has already been changing in terms of precarity of living, rising inequality and the inadequacy of pensions and other social protections.

Whatever an "SME" or an "employee" was ten years ago, it is qualitatively different today. Many of the careers and professions of ten years ago, no longer exist today. And that is part of the challenge for redefining the SME. The way in which the SME today creates jobs is very different from one or two decades ago. The COVID-19 crisis has accelerated of these changes already underway.

Uber may be a case in point, with its minions of non-employees obliged to invest on its behalf, often for a modest pay-back. Other cases include Instagram which had 13 employees when it was acquired by Facebook for $1B. As a part of Facebook, it is believed (in February 2020) to have a value of about $100B and 700 employees. Mojang had 12 employees when it reached $100M in revenues. Ethereum was valued at about $14b early this year with 300 employees. The world of hedge funds and finance has many such examples.

From that point of view the idea that we need a static "definition" of an SME may be ill advised. international practice and even current practices in EU member states, suggest that the need for flexibility is real. Perhaps what we really need is a set of principles to apply when deciding what kind of businesses should be eligible for state aid and admit those that qualify based on the application of principle, rather than the application of rules that struggle for relevance due to inherent and irreducible complexity and rapid change.

At a stretch, it may be useful to go beyond the SME as the economic unit and embed it in a broader spectrum of economic actors that includes sole traders and gig-workers and people with portfolio careers operating multiple small jobs. More and more people occupy this grey-zone between being and "employee" and an entrepreneur/company director. The COVID crisis has exposed these as often unwilling but real risk takers, usually not by choice, forced into entrepreneurship by large corporation that "travel light." Many of these have found themselves overlooked by schemes intended to support small business, despite the disruption wrought by the COVID-19, the repeated and largely unpredictable lockdowns, as well as the sudden changes in consumer behaviour this has caused.

And what does this all mean? Good question! It may be time to re-think thinking about enterprise and society, ab-initio rather than tweaking a model that ceased to work for many, for many years.

The Nature of Start-Ups, Founders and Entrepreneurs

In 2009, Steve Blank along with Eric Ries and Jan Osterwalder led a revolution in the way we think about start-ups. The key insight was the realization that a startup is not just a small version of a large company. Large companies execute a known business model, and their strength is operational efficiency. The goal of a start-up is to search for and validate a business model.

This insight led to the development of the lean start-up movement and introduced a whole new vocabulary for thinking about the development of start-up businesses, based on concepts such as the Minimal Viable

Product or MVP, the "pivot" and customer development. Many of these ideas have since been adapted for use by large entrepreneurial corporations, as well as by the actors and agencies of public administration. This process led Steve Blank to the realization that there are in fact different kinds of start-ups, entrepreneurial organizations, and entrepreneurs.

In a blog post in 2010[173] he distinguished between 4 types of entrepreneurial organization.

- Small businesses
- Scalable startups
- Large companies and
- Social entrepreneurs.

In 2013 he based his approach to start-up development on 6 categories of start-up,[174] namely…

- Lifestyle Startups where the founders work to live their passion
- Small-Business Startups where the founders work to feed the family
- Scalable Startups which are born to be big
- Buyable Startups which are intended from the outset to be acquired
- Social Startups which want to make a difference to the world
- Large-Company Startups which must "innovate or evaporate"

In 2015[175] he categorized start-ups on the basis of the market they will seek to occupy, namely…

- Existing markets,
- Re-segmented markets,
- New markets, and
- Clone markets.

These distinctions would help the organization to clarify the 'problem' of growth it will need to address, the kind and level of risk involved, as well as the steps needed to succeed in achieving its ambitions.

Other thinkers had developed other categorizations of entrepreneurs. Professor Henrik Mariendal Andersen and Entrepreneurship Consultant Mogens Thomsen for example[176] identified…

- The Traditional Entrepreneur
- The Growth Potential Entrepreneur
- The Project-Oriented Entrepreneur
- The Lifestyle Entrepreneur

The founder plays a very important role in a start-up and so it is also important to understand this corner of humanity, that which is made up of people who start companies rather than joining one and becoming an employee. Social scientists are taking an interest in entrepreneurs, their motivation, and capabilities. The findings of a research paper entitled "Asymmetric Information and Entrepreneurship" based on the observation of 12,686 people over a period of 30 years[177], overturned old tropes that that entrepreneurs were of lower cognitive ability than those who succeed well in exams and were sought-after by large organizations, that these were "lemons rather than cherries." The most provocative finding of the paper was that "asymmetric information about ability leads existing companies to employ only 'lemons,' relatively unproductive workers" and that is was the more talented and productive who choose self-employment or entrepreneurship.

The point about "information asymmetry" is that entrepreneurs know things that do not show up on resumés, they know about their capacity for resilience, curiosity, agility, resourcefulness, pattern recognition, tenacity, and passion for their work. These are things that do not easily show upon resumés or in job interviews. One of the qualities of the entrepreneur is a conviction or feeling that they can do as well if not better by striking out on their own than by working in a large corporation.

In his blog post, Steve Blank discusses this in the light of writing about the recruitment process of Marissa Myer in Google[178], and the fact that many of the innovations of Google are the result of acquisition of start-ups created by people external to the company. He sums it up saying that "the type of people Google and Marissa Mayer wouldn't and didn't hire, started the companies they bought."

One of his conclusions is that despite the great efforts made to create and cultivate entrepreneurs, maybe entrepreneurship is not for everyone. It provides an interesting perspective on the COVID crisis and the temptation that many VC funds might feel to use it as an opportunity for triage.

Efforts have been made by academics to elaborate on the nature of the owner-manager. Many start-ups and small businesses are managed by their owner-directors who have strong emotional ties to the business. On the other hand many larger companies are run by professional managers who see the company as part of their career progression and whose loyalty is very much linked to the level of their remuneration. Loecher[179] has explored what he calls the "personal principle" meaning that the company manager performs a central role in the business decision-making processes, he or she understands the company as a lifelong duty and maintains direct contact with employees, customers, and suppliers. The principle of "unity of leadership and capital" means that the company manager proprietor are one and the same person, the manager-owner in addition to leadership duties takes up all or at least some of the liability risk. This thinking goes back to work by Theile published in 1996, who is quoted by Loecher as having developed the "personal principle" and the principles of "unity of leadership and capital", but for which no references were provided.

Models for Understanding the Growth of Small Business

One of the most recent academic works on the definition of small business is contained in a book released in December 2019 and published in 2020 entitled "Analysing the Relationship Between Innovation, Value Creation, and Entrepreneurship" by Galindo-Martín, Mendez-Picazzo and Castaño-Martínez[180]. It briefly surveys the literature on the subject. In doing so it cites and refers to the Bolton Report of 1971[181]. This was the outcome of a Committee of Inquiry set up by the UK labour government in 1969, on the role of small firms in the economy. Although it is nowadays considered to be wrong on a number of key issues, it was highly influential and changed perceptions of the role of small business in the UK economy[182].

Galindo-Martín et al also cite the work of Blackburn and Jarvis published in 2010[183], Storey and Greene published in 2010[184], Westhead, Wright and McElwee published in 2011, Bridge and O'Neill published in 2012, as well as Berisha and Shiroka Pula published in 2015[185].

Storey et al and Westhead et al refer to a number of theoretical approaches to understanding the growth of small business. These include:

- The Resourced Based View
- Industrial Economic Theory
- Managerial Theory
- Evolutionary Theory
- Social Network Theory
- Random Theory

Each of these approaches have their strengths and shortcomings. The obvious conclusion is that there is as yet no comprehensive theory that explains the growth of small businesses. This of course begs the question of how different governments differentiate between different categories of business, with a view to deciding their eligibility for government aid.

Galindo-Martín et al point out that the definition of small business varies considerably from one country to another, and even from one sector to another. They refer to cases of the EU, the US, South Korea, and South Africa, the last of which they describe in some detail.

It is worth noting that that the scheme applied in South Africa is based on 5 categories business, namely medium, small, very small, micro[10] and survivalist[11]. The details of which business falls into which category are defined on a sector-by-sector and even by sub-sector basis using a mixture of criteria that include the total gross value of assets, the total annual turnover, and the number of people employed.

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[10] Where the turnover is below the threshold for VAT declaration.

[11] Where the turnover is below the threshold for poverty.

Another aspect of the definition of small business is the choice of criteria to use, the thresholds for eligibility that apply, as well as the use of criteria for exclusion. Bridge and O'Neill writing in 2012[186] are of the view that the concept of growth itself is ambiguous, and that growth means different things to different actors. They point out that:

- Growth for a company owners is sales and profit
- Growth for the government may mean the number of employees
- Growth for investors may mean shareholder value.

On the basis of this, it seems reasonable to conclude that the criteria for eligibility for a program, should be established based on what that program is intended to achieve, and that this may be different depending on the category in which it is present.

Annex 10: Financing Start-Up and SME Growth

In answer to the question, "where do companies find the money they need to grow" the solutions are many and increasing. They include …

- Own funds
- Bank loans
- Bond issues
- Share issues
- Crowdfunding
- Grants and the 3Fs (Family, Friends and Fools)
- Recent Innovation in VC funding models

OWN FUNDS: Companies achieve what is called organic growth by investing their own reserves in activities intended to stimulate and support their own growth. This includes investment in research, new product development and innovation, new sales and marketing capabilities, the expansion of production, the opening of new offices etc. The advantage of this is that there are no third parties involved, and that the company has a maximum of discretion of how it spends its own money. What has changed over the years is that companies have tended to invest less and less in research and innovation, to focus on other strategies for growth based on mergers, acquisitions, and strategic partnerships.

BANK LOANS also Referred to as DEBT: Banks provide loans and revolving credit lines to finance short, medium, and long-term financing needs of firms. This requires a good credit record, good financial performance, and good prospects for the future. Loans tend to be secured against some form of collateral such as real estate, machinery, or IP. As a general rule, there are no loans for companies that have no track record, and there are no loans for companies that have no collateral.

BOND ISSUES: A company can also raise finance by issuing bonds. These are essentially IOUs and there are costs associated with the issue, such as fees for the underwriter. Exchange traded bonds are issued on the primary market where they can be bought by investors. They are then traded on the secondary market where investors now trade them among themselves. The issuer must make regular interest (coupon) payments to the bond holders and pay the face value of the bond to the bond holder at maturity. All of the complicated arithmetic of who owns what bond and who pays how much, when and to whom, is managed by a transaction agency.

SHARE ISSUES: A company may raise money by selling its shares either privately or via an exchange. There are different kinds of "stocks" ranging from "blue chip" to "penny" stocks. There are also different exchanges were these stocks are listed and can be traded. Blue chips tend to be traded on the major stock exchanges such as Deutsch Bourse in Europe or the NYSE in the US, whereas penny stocks are mostly traded via OTC Bulletin Boards and the so called "pink sheets."

OTHER SOURCES: These are primarily subsidies or soft loans from the public sector, to finance risky activities such as research and innovation. They include subsidies or soft loans to help under-capitalized companies undertake investments needed for growth, which they cannot finance on their own or which the private sector will not finance due to their poor credit rating. They also include new innovative sources of finance from operators of crowdfunding and peer-to-peer lending schemes, as well as what are known as ICOs, Initial Coin Offerings. There was a period recently when a substantial number of companies raised money by creating their own digital currency, floating it on an alternative currency exchange and then using the increase in value of the traded currency to finance its own separate business activities.

The traditional role of the VC is to take an unlisted company and prepare it for listing on a major stock exchange. It used to be that private companies relied on listing to obtain large amounts of cash it needs to grow, amounts large than the VC can provide. But that has tapered off in recent years and companies have delayed listing, or even eschewed listing altogether preferring to go the private route of acquisition by a strategic partner or a PE firm.

What this means in practice has changed over the years. It also depends on the size of the fund and the stage of investment.

In his 1961 opus on corporate debt[187], Gordon Donaldson observed that companies tend to prioritize their source of financing according to the cost of financing, and for that reason they raise finance for their operations by issuing shares only as a last resort. This idea was refined and further developed in 1984 in a paper by Myers and Majluf[188] where they postulate that the preference for financing activities based first on for internal funds (organic growth), then debt and only when it is not possible to issues mor debt, by issuing equity. Their reasoning that the logic underlying this preference or "pecking order" was the information asymmetry inherent in the transaction, where the managers of businesses know much more about the business than any investor, and that the cost of finance was driven by an asymmetry in access to information about the business, how it is manager and its future prospects.

Some researchers have found evidence to support the pecking order model. These include Zeidan, Galil and Shapir[189] based on their work with owners of private firms in Brazil, also Myers and Shyam-Sunder[190] in 1999, and Watson and Wilson[191] in 2002.

Nevertheless, the model or theory is not without controversy and continues to receive attention from researchers who seek to better understand decision-making in relation to corporate finance. Brealey, Myers and Allen[192] note that high technology companies provide an exception to the general rule, possibly due to the fact that their assets which include patents, industrial secrets and know-how are intangible and harder to value than more traditional assets such as machinery, inventory or real estate. Frank and Goyal show, among other things, that pecking order theory fails where it should hold, namely for small firms where information asymmetry is presumably an important problem[193].

Yang, Xia, and Wen have recently explored the impact of a combination of equity and debt on the performance of VC backed enterprise[194]. Their work is based on analysis of HGE in China, more specifically companies listed on the Chinese Growth Enterprise Market (GEM, established in 2009). The companies listed on GEM tend to use debt, equity, and combinations of the two, to finance their growth plans leading up to IPO. The researchers confirmed results obtained by others elsewhere concerning the impact of debt (leverage) on enterprise performance and the impact of equity investment (venture capital), namely the positive impact of VC funding and a negative impact of debt on the share performance of enterprise post-IPO. They then examine the impact of the combination of equity and debt on the post IPO performance of companies. They find that the combination of debt (leverage) and venture capital has a greater negative impact on performance, than debt alone. They conclude that priority should be given to venture financing and that both founders and investors should take care not to introduce or increase debt prior to IPO. There are many questions that the researchers leave un-answered. For example, they do not examine the reason for this result. They do not look into the fact that the VC is primarily interested in the result at IPO and not post-IPO. They do not comment on the nature of debt and its use, for example if any of this debt is used to finance research or product development or if it is mainly focused on expanding capacity in marketing and sales. Answers to these questions might have more relevance for SME policy and in the design and targeting of programs and services intended to encourage the development of HGE.

This last theme of recent innovation in VC funding models is covered in a separate annex to this paper, "Annex 8: Innovation in VC Financing Models and Exit Strategies."

Annex 11: The Complexity of Start-Up Finance Trajectories

On Wednesday 27 May 2020, I had a zoom meeting with Tony Collins of Pitchbook. Previously, I had explained that I was interested in having access to the Pitchbook database with a view to understanding

- The relationship between research and innovation and investments made in start-ups and early stage ventures by VC and PE funds, as well as
- The impact that variations on the definition of an SME might have on the participation of VC-backed companies in European research programs.

I provided the following basic ideas to give them an idea of what I would like to explore in their data.

The eligibility of an SME is based on the following criteria:

- No. of employees (less than 250)
- Turnover (less than €50M)
- BS Total (less than €43M)

The count is more complex for companies that are VC- or PE-backed and includes

- 100% of the value for the company +
- 100% of the values for investors that are considered "linked companies" +
- A weighted share of the values for investors that are considered "partner" companies

I explained that the definition of both "linked" and "partner" companies referred to above is complex and open to interpretation. That I would require access to datasets that would allow me to see how much each investor invests in a portfolio company, as well as details on the investor itself, namely their number of employees, turnover and balance sheet total. That I would need to be able to explore different searches rather than simply obtain the results of a well-defined search.

I explained that ideally, I would like access to a database that could be used by policy experts working on SMEs, research, and innovation

- To explore the impact of different interpretations of the definition on the eligibility of VC backed enterprise applying to EU funded SME programs.
- To stress test possible new definitions of the SME in Europe with a view to allowing them unfettered access to SME oriented programs for research and innovation funding.
- To understand how growth happens in high tech sectors and run scenarios for the variation of new SME definitions as a function of the sector in which they operate.

Specifically, I asked if it is possible to compile from their database lists including:

- The company
- The sector
- The no of employees
- The turnover (also the classification as pre-revenue, revenue generating and profitable…)
- The deal stage (pre-seed, seed, A, B, C… exit …)
- The total amount invested
- The pre-money BS total (perhaps a proxy is pre-money valuation)
- The post-money BS total (perhaps a proxy is the post-money valuation)
- The names of the investors, and for each investor
    - Their role (LP, GP)
    - Their share in the portfolio company
    - The number of employees

- The Turnover
- The BS Total

Based on my meeting with Tony Collins of Pitchbook on Wednesday 27 May, I found out the following.

The Pitchbook database contains data on 404,309 deals involving 207,345 companies.

The deal-data includes the amount of money invested, by the fund and by each investor. It includes details on aspects of ownership such as holdings of ordinary and preferential stock (class A and class B shares). Cases exist where preferred stock confers 20 times the voting rights of ordinary stock. Some stock has no voting rights at all.

Company data includes data on revenues and companies are classified using a scheme that identifies companies as being "pre-revenue," "revenue generating" or "profitable."

The majority of deals have little or nothing to do with high technology. For example, many relate to real estate, retail chains or product concepts such as new (brands of whiskey), which do not necessarily require large investments in research and innovation.

In order to understand the role of VC-PE activity in research intensive sectors, it is possible to search deals based on terms such as "AI," "Virtual Reality," or "Big Data." Since 2009 For example, there have been 1,339 deals in AI. That is deals in Europe involving firms headquartered in the EU.

The database is primarily concerned with deals involving VC and PE actors. It provides details on VC and PE investment in companies at seed, early stage, and late stage investments as well as exit broken down by type of exit (of which there is an increasing variety).

The database also records information on other sources of investment such as crowdfunding and grants from public funding bodies to support research, innovation, and business development. For example:

- 1,518 of the recorded deals correspond to grants from Enterprise Ireland.
- 1,669 of the recorded deals correspond to grants from H2020.

It is possible to drill down into those deals to see the funding history of the company, and identify the funding bodies, the VC fund and the investors that have contributed the growth and development of the firm. It is interesting to note that the funding history of those companies show a mixture of public and private finance, including situations where public money for research came after private money for growth.

At the end of this section is a series of screen shots captured while using the Pitch Book platform. 4 of these concern a company based in Ireland called Hibergene Diagnostics. The first slide gives a graphical overview of the timing and size of its deals and the number of employees. Subsequent slides drill down into the deals. This reveals that

- Deal Number 1 in February 2015 was a Series A VC funding round of just over €2M to help commercialize tests it had developed and recruit employees.it is interesting to note that Enterprise Ireland took part in this round as one of the investors, not as a provider of a grant or of debt.
- Deal number 2 in February 2016 was a grant of €50k from H2020.
- Deal Number 3 in April 2017 was a Series B VC funding round of €6.7M to expand the companies R+D programs and accelerate the development of new products intended for launch in 2017.
- Deal number 4 in December 2018 was a VC deal with no extra money.
- Deal number 5 in May 2020 was a grant of €930k from H2020.

This kind of data gives interesting insights into the process of growth, about which it is otherwise difficult to make useful generalizations. Pitchbook also has data on the situation of the company. So, in principle it affords a detailed view on the growth history of a business based on its use of grants, debt and equity.

It is also possible to drill down into the data on the funds (which are not corporations), the fund management companies (GPs) and the investors (GPs + LPs). For example, one can carry out searches that identify what funds an investor is involved in, as well as the deals and amounts committed.

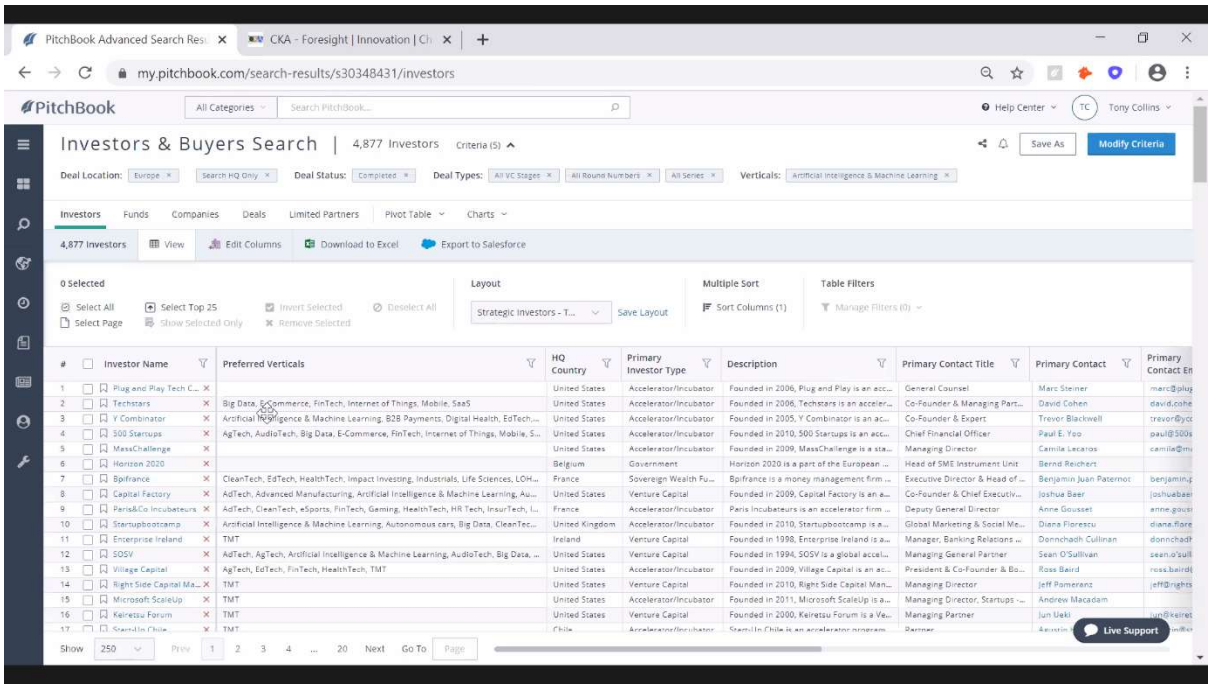
Interesting insights can be gained from examining the financing history of VC backed funds. Most companies do not follow a simple trajectory where an initial research phase based on public finance is followed on by a private phase where the VC industry steps in. The trajectory differs a lot from one sector to another, but it is invariably complex, with many different kinds of actors intervening at different stages. Typically, the pendulum swings back and forth between public and private actors, then back to public and private again. As a general observation there is not cut-off in the life of a company where the public money has done it jobs and it is now up to the private sector to take over from there.

The first slide at the end of this annex is a screenshot to illustrate the results of a search of "investors and buyers" that have been active in a specific sector (AI and Machine Learning). The search lists 4,877 entities (out of a total of 209,704) classified according to "accelerator/incubator," "venture capital," "sovereign wealth fund," "government" etc. The list includes entities such as "H2020" and "Enterprise Ireland."

Although the details (weighting of differential voting rights etc.) vary from deal to deal, this is a very good starting point for exploring the relationship between ownership and control in the start-up VC-PE nexus.

Given the dearth of up-to-date understanding on how firms grow, the Pitch Book database seems to provide an excellent resource for researchers that allow them to see in detail how companies evolve based on their funding history. It is also a good source of information on the various actors involved. The list goes far beyond VC and PE funds to include finance raised from the 3Fs, crowdfunding platforms and research programs such as the EUs H2020. If it is true that many researchers and policy experts find it hard to get a good overview of how companies grow, the institutions that are involved, their nature and their relation to one another, access to the Pitchbook platform could help those experts stay up to date and develop an awareness of how this world is evolving.

It may require some "massaging" to organize the data in the most easy to use manner, but it seems well suited to running scenarios (stress tests) on the impact of new SME definitions on the risk of VC backed enterprise being excluded from access to SME oriented research programs.



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Highlights

Employees
21
As of 27-Apr-2020

Total Raised to Date
£7.38M
As of 20-May-2020

Edit Highlights

Timeline

Round & Amount

Date Founded | Financing Round | Captured Employee Count | Estimated Employee Growth

General Information

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Deal History (5)

#	Deal Type	Date	Amount	Raised to Date	Pre-Val	Post-Val	Status	Stage
5	Grant	20-May-2020	£0.82M	£7.38M			Completed	Generating Revenue
4	Later Stage VC	21-Dec-2018		£7.38M			Completed	Generating Revenue
3	Later Stage VC (Series B)	12-Apr-2017	£5.77M	£7.38M			Completed	Generating Revenue
2	Grant	10-Feb-2016	£0.04M	£1.62M			Completed	Generating Revenue
1	Later Stage VC (Series A)	02-Feb-2015	£1.62M	£1.62M			Completed	Generating Revenue

† Indicates an add-on
£ Estimated

Deal #5: Grant, £0.82M, Completed; 20-May-2020

Deal Types	Grant	Raised to Date	£7.38M **
Deal Amount	£0.82M	Total Invested Capital	£0.82M
Deal Status	Completed	CEO/Lead MGT	Simona Esposito
Deal Date	20-May-2020	Site	Dublin, Ireland
Financing Status	Venture Capital-Backed	Business Status	Generating Revenue
Financing Source	Other		

Deal Synopsis
The company received EUR 930,000 of grant funding from Horizon 2020 on May 20, 2020.

† Not necessarily a summation of individual debt figures
** Does not include grant funding
£ Estimated

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Deal #3: Later Stage VC (Series B), £5.77M, Completed; 12-Apr-2017

VC Round	2nd Round	Raised to Date	£7.38M **
Deal Types	Later Stage VC, Series B	Total Invested Equity	£5.77M
Deal Amount	£5.77M	Total Invested Capital	£5.77M
Deal Status	Completed	CEO/Lead MGT	Brendan Farrell
Deal Date	12-Apr-2017	Site	Dublin, Ireland
Announced Date	19-Jan-2016	# of Employees	9
Financing Status	Venture Capital-Backed	Business Status	Generating Revenue
Financing Source	Venture Capital		

Deal Synopsis
The company raised EUR 6.7 million of Series B venture funding led by Cantor Fitzgerald on April 12, 2017. Ruffena Capital, Kernel Capital (Ireland) & MedCaptain also participated in this round. The new funds will be used to expand company's R&D programmes, with a number of new products planned for launch in 2017

Not necessarily a summation of individual debt figures
** Does not include grant funding
£ Estimated

Deal Details

- 4 Investors - Cantor Fitzgerald (Cantor Real Estate Fund), Kernel Capital (Ireland) (Bank of Ireland Kernel Capital Venture Funds, Dawn Walsh), MedCaptain (Justin Liu), Ruffena Capital
- 1 Advisor - SyndicateRoom (Lead Manager or Arranger)
- 2 Tranches - Later Stage VC (19-Jan-2016), Later Stage VC (12-Apr-2017)
- Stock Info

Deal #2: Grant, £0.04M, Completed; 10-Feb-2016

Deal Types	Grant	Financing Source	Other
Deal Amount	£0.04M	Raised to Date	£1.62M **

Deal Synopsis
The company received EUR 50,000 of grant funding from European Union's Horizon 2020

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Deal #2: Grant, £0.04M, Completed; 10-Feb-2016

Deal Types	Grant	Financing Source	Other
Deal Amount	£0.04M	Raised to Date	£1.62M **
Deal Status	Completed	Total Invested Capital	£0.04M
Deal Date	10-Feb-2016	CEO/Lead MGT	Brendan Farrell
Announced Date	04-Feb-2016	Site	Dublin, Ireland
Financing Status	Corporation	Business Status	Generating Revenue

Deal Synopsis
The company received EUR 50,000 of grant funding from European Union's Horizon 2020 program on February 10, 2016.

Not necessarily a summation of individual debt figures
** Does not include grant funding
£ Estimated

Deal Details

- 1 Investor - Horizon 2020 ((EU) Horizon 2020 Fund)

Deal #1: Later Stage VC (Series A), £1.62M, Completed; 02-Feb-2015

VC Round	1st Round	Raised to Date	£1.62M **
Deal Types	Later Stage VC, Series A	Total Invested Equity	£1.62M
Deal Amount	£1.62M	Total Invested Capital	£1.62M
Deal Status	Completed	CEO/Lead MGT	Brendan Farrell
Deal Date	02-Feb-2015	Site	Dublin, Ireland
Financing Status	Venture Capital-Backed	Business Status	Generating Revenue
Financing Source	Venture Capital		

Deal Synopsis
The company raised EUR 2,115 million of Series A venture funding from BOIMTAF, Kernel Capital and Enterprise Ireland on February 2, 2015. Other undisclosed investors also participated in this round. The fund will be used to commercialize both tests and to recruit further employees.

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Annex 12: Trying to Imagine a Post-COVID World

Impact of COVID-19 on Citizens

Der Spiegel estimates that Germans could lose as much as €390B due to the pandemic with "a big chunk of the middle class … at risk of slipping into poverty."

One of the reasons why people believe in the permanence of these changes is the belated recognition of a reality that so far has largely been ignored, that the world is increasingly at risk from pandemics that will spread rapidly, whose nature and impact we will struggle to comprehend and for which we have so far made little preparation. There is a substantial "I told you so" literature on this and big four consulting companies are now vying with each other to establish thought leadership on what companies and governments need to do next. One of the most recent of these is an article by McKinsey entitled "Not the last pandemic: Investing now to re-imagine public health systems."[195]

Impact of COVID-19 on Start-Ups

Start Ups Weekly by Tech Crunch has written about the impact that new and emerging trade wars with countries like China will most likely have on start-up eco-systems. The editorial of its newsletter dated July 10, 2020 discusses how these conflicts will impact the market prospects of new technology companies by reducing their "total addressable market", a key issue that start-ups typically address when pitching to investors. Such a view is supported by tit-for-tat challenges between tech giants of the US and China such as Facebook and Tik-Tok[196].

A summary of their findings has been published on Flourish[197] and highlights refer to a VC and founder sentiment survey showing among other things that

- 60% of early-stage valuations have dropped by 20% to 30% percent
- 30% of founders experienced a reduction in revenue
- Almost 24% reported an increase.

Dealroom and Sifted are currently working on a two-year EU and EP funded "European Startups" project[198] intended to provide real-time insights into the status of startups across the EU. One of the outputs of this project is a "European Startups Dashboard"[199] providing continuously updated information and insight on investor activity, funding rounds and exits. They have recently published an entitled "The impact of Covid-19 on Europe's startups[200]." Key findings of which include

- 49% of European startups have turned to banks for government-backed loans
- 43% have frozen hiring
- 40% of European companies expect to see revenues down at least 25% in 2020
- Although a third of those surveyed expect to make permanent layoffs, only 17% expect to lay off more than 10% of staff.
- 66% of companies have more than a year's cash runway to tide them over.

The FT has written about the state of start-ups in general, (not necessarily venture backed) noting that in April 2020, an estimated 40% of UK start-ups have less than one year of cash left, while around the world the figure is much worse, with 41% of global start-ups having less than 3 months cash left[201]. From this perspective VC backed start-ups seem to be in a much more resilient position that the start-up world in general.

Impact of COVID on Large Businesses

The FT has written about the increasing number of acquisitions or buy-outs where the buyer has had second thoughts and seeks either to negotiate the agreed cost of acquisition or simply with draw from the deal[202]. To a large extent this is a response to the pandemic and the impact of lockdowns on normal life, on business and on the ability of both people and business to spend. The formal agreements on which acquisitions are based contain language dealing with things like buyer remorse or the failure in the transaction, and often refer to something called "Materially Adverse Effects." In principle this gives the buyer a get-out clause in cases such as COVID, where the entire basis for the business or its valuation for the purpose of acquisition, is upended. It

is never as straightforward as it looks. Many deals have been quietly abandoned and many more are being contested. The only winners here are the law firms that help out in settling the disputes. It is just one more aspect of the chaos caused by COVID and the related troubles being stored up for the future.

Tim Denning has been writing about the dangers now posed by CLOs or Collateralized Loan Obligations[203]. These are based on corporate debt a.k.a. the bond market, which has featured so prominently in discussions about how to support industry in the wake of the pandemic, in both the EU and the US. He reminds us of how the CDOs (Collateralized debt Obligations) played such an important role in the financial crisis of 2008. These were based on the bundling of home mortgages and introduced the world to an arcane terminology including concepts such as NINJA loans[12] and sub-prime mortgages. Referring to experienced industry insiders who lived through and participated in the 2008 crisis, he explains that the growing interest in the use of CLOs could make a significant contribution to the next major financial crisis.

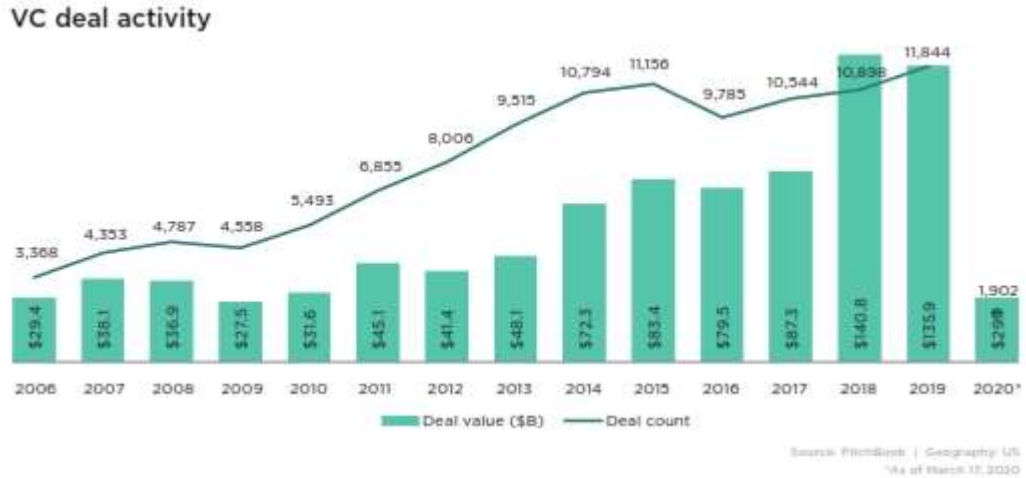
Impact of COVID-19 on VC and PE Activities and Strategies

In a "pandemic" edition of its Private Market playbook entitled "Now What,"[204] PitchBook has recently produced a useful summary of the impact of the COVID-19 pandemic on start-up ecosystems and on the strategies of VC, PE, and buy-out funds. Paul Condra one of the analysts writing in this report, refers to the adoption of remote working in many industries and for many workers as "the great unlocationing." He claims that "fully distributed work could be the next megatrend to dramatically reshape the economy."[205]

The report examines in detail the impact of COVID-19 on different technology sectors[206], in a way that can be roughly summarized as follows:

- **Significant Impact:** Retail, Health + Wellness, Foodtech, Mobility and IoT
- Moderate to Significant impact: Insurtech and Fintech
- **Moderate Impact:** AI and Supply Chain Technology
- **Low Impact:** Cloudtech and Infosecurity

The report analyses deal activity for the VC, PE, and buy-out sectors. The picture for VC is especially stark. In the year to April 2020, IPO exit events are 82% fewer so far than in 2019 as illustrated in the following graph.



This paints a picture that looks worse than it is in reality. The 2020 figures refer to deal activity over the 3 months from January to March. A simple-minded extrapolation to whole year figures suggests that the total number of deals for the year might come to about 7,600 or 65% of what they were in 2019. Arguably the analysts did not attempt to do this, due to the uncertainties involved.

Analysis provided by the NVCA based on Pitch Book data[207], concludes that the exit count for 2020 is likely to be the lowest since 2011. It concludes that the total valuation of all exits will drop back to that of 216 or 2017. It too raises a warning flag about an expected drop in liquidity that may impact the behaviour of VCs

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12 Loans made to people with no income and no job

with regard to commitments. At issue is the basic fact that IPO exits return money to the LPs (and GPs) and provide them with the resource they need to invest in new funds.

Nevertheless, and despite fears about a liquidity squeeze, the report observes that fundraising remains strong. It notes that already 24 VC mega-funds (funds with more than $500M in commitments), have closed so far in 2020, almost as many as closed for the whole of 2019.

In a piece entitled "Now what?" James Thorne and Priyamvada Mathur analyse the impact of COVID on the strategies of VC funds[208]. Their conclusion is that there will be a significant change in the industry as it moves away from a mind-set influenced by the easy availability of money to invest, adopting a much more defensive and controlling approach in the years ahead. The pandemic has led to a huge wave of business closures and lay-offs, with unprecedented levels of unemployment, loss of earnings by both individuals and companies, and radical changes to the vitality of markets and entire sectors such as brick and mortar retail, airline travel and anything somehow related to non-essential spending.

This has caused VC funds to re-evaluate their portfolio companies, examining them in terms of their ability to survive the slowdown and emerge with new business models. VCs will distinguish between companies that can pivot away from business models that have been upended by the pandemic,

The fast charging approach to deal-making of the last few years will give way to a slower more defensive approach. For the time being PCs are being asked to "shelter in place," cut back on spending, stop hiring and focus on the development of earnings and profitability. The founder-friendly approach that has emerged in the last few years, will give way to an approach that demands more oversight and control over spending. In the authors' view funds will look for more contingencies and earn-outs, greater power of veto over the appointment of board members, stronger operational controls, and greater oversight on spending.

Not so long ago, LPs were under pressure to engage in PE and VC activities because of the expectation of higher returns this would provide compared to other investment activities. Many are now under pressure to lower their commitments to risky activities such as PE and VC. The availability of capital for investment had been boosted by the entry of non-traditional investors into the sector, which were also hoping for higher than stock market returns. These included corporate investors, universities, endowments, family funds, and other so called "tourists." Now that so many corporations and other actors are being hit by the pandemic, it is likely that these will withdraw from the VC game for the time being, seeking opportunity elsewhere. This all adds to the difficulty that the LPs and GPs may experience in the creation of VC funds for follow-on financing or the funding of new areas of business opportunity.

The report contains an article by Andrew Woodman on what happens when LPs do not or cannot meet their commitments due to liquidity constraints.[209] It starts with a reminder that life is not all roses for LPs and that many have recently 'taken a hit' in the public markets and are currently under pressure to reduce their exposure to investment in PE and VC. That makes it difficult for the GPs of the VC funds they have invested in, to drawdown money when it is needed. In these situations, GPs are forced to find other sources of funding to shore up or defend their portfolio companies. A range of specialized financial products have emerged to meet their needs. These include what are known as "subscription lines of credit" that allow the GP to borrow from banks in order to support their PCs. Since this practice started, it has grown in sophistication and now also contains what are called "asset backed facilities." These are distinguished by their ability to tap into different kinds of collateral, including assets such PC equity, as well as borrowing secured against future drawdowns.

Mixed Messages for Now and a Need to Shelter In Place

A lot has been written in the last few months about the status of start-ups and VC-backed startups in the EU, in the US and around the world. Many of the reports on PE, VC and stock market dynamics remain optimistic. But there is still a lot of uncertainty as to how the pandemic will play out, and as to what impacts will last and become permanent and what impacts will prove only fleeting. In that context it makes sense to examine what is going on underneath market dynamics, what is happening to citizens and business in general, not so much to explain what is currently being observed but to understand what is driving the "the real world" as opposed to what is driving the world of those who make money on the daily movements of stocks.

Observers of VC activity have been upbeat about the performance of the VC sector so far 2020. In one article Crunch Base has written about VC funding falling in Q2 for North America. In another it claims that "although it has been down compared to previous years… it is not as dire as we expected.[210]" Dealroom is upbeat in an article about how VC has rallied in the EU in Q2[211] and in collaboration with a group of 35 international VC

funds, it carried out a large-scale survey on startup resilience, to find out "how are startups really doing in 2020?" The news is mixed and hard to summarize in any simple way.

Prospects of a Recovery

McKinsey observes that we are in a period it calls "the great acceleration."[212] The same point has been made by others. In summary it means that many of the trends we see today are a continuation of trends that started before the COVID crisis, which have simply been accelerated. It is useful to recognize this as it means that not everything that is happening now is due to COVID, but part of a pattern of adjustment that had started up to two years before the pandemic.

Bloomberg reports that US banks no longer believe that we will see a V-shaped recovery and have started to set aside record provisions for bad-loans.[213] They also report on the analysis of Edward Altman, a New York University professor, who specializes in corporate bankruptcy.[214] At the time of writing he observed that 30 US companies have filed for bankruptcy protection with over $1B of liabilities, since January of this year, and was of the view that the number of companies filing for bankruptcy protection would exceed 60 by the end of the year. His remarks were intended as a warning to those involved in corporate bonds and other forms of credit investing. They were also a warning as to the possibility of new waves of unemployment and loss of income for those who lose their jobs, and loss of demand for non-essential spending, that will arise as a consequence of such bankruptcies.

What this means for Society

There have been many articles about the unprecedented levels of unemployment arising as a result of the pandemic. The situation is especially difficult for gig workers and for the self-employed. For those on furlough the worry is if or when they will be made redundant.

Martin Wolf of the FT recently took part in an OECD podcast[215] to talk about how "We are facing the worst jobs crisis in nearly a century."

Claer Barrett of the FT explains that workers with savings could soon find out that they are not entitled to many benefits[216] or COVID relief. The view is that these will spend their savings, further reducing their personal defences against bad times, and their ability to consume. Others have written about how it has affected the availability of freelance work[217], the retirement plans of older business owners[218] and even the economies of developing countries due to a massive decline in remittances as a result of the reduced ability of poorer people such as immigrants, to spend[219].

Add to this the story of the decline of the middle class[220], both an American and a European story covered in great detail by among others, an emerging class of celebrity economist such as Thomas Piketty[221].

The Irish Times has reported on how the AIB has started to implement a de-facto ban on lending to recipients of COVID payments, those working in sectors that are considered to be at risk, and the self-employed[222].

Maris Kreizman writing in Medium[223] provides interesting insights into how work culture has changed, including the prospects for young people entering the workforce. She describes how "a drive to succeed has become a drive to just get by."

Both businesses and individuals are facing unprecedented difficulty in paying rent. Der Spiegel has described how high rents are affecting ordinary Germans[224] and Spaniards[225]. Efforts to impose a rent freeze in Berlin[226] though welcome, does not address underlying issues of high and rising rents that predate the pandemic, a problem in many countries in Europe, in particular in Ireland[227]. The rent holidays being offered by landlords and mortgage holidays being offered by banks are generally seen as storing up trouble, as they will only lead to debt piling-up with interest due on unpaid rents, becoming ever more unmanageable for people who depend on out-of-work earners or for businesses that have closed or even gone under due to the lockdown[228]. Bloomberg has written about "the coming wave of coronavirus evictions" and the damage it will do, in particular to African American and immigrant renters in the US[229].

In the corporate world, the drop in demand for commercial real estate has left landlords with WeWork leases exposed to over $40B in commitments that they will struggle to meet, due to lack of tenants[230].

In August 2019, the BBC reported on a study carried out by Aviva insurance[231]. They estimate that over one million young people will move in with their parents over the next decade. The report observes that already over 11% of houses in London are overcrowded, with rates as high as 25% in the worst boroughs. It projects that the number of households containing two or more families will rise from 1.5 million to 2.2 million over

the next 10 years. It forecasts that 3.8 million people aged between 21 and 34 will be living at home by 2025, a third more than in 2019.

Problems such as these have been building up for decades, but they have been accelerated due to the pandemic. They will be made even worse due to the expected largescale and permanent shift to home- and remote-working, that will put even greater demands on the space in which people.

There has been popular backlash against high rents. Bryce Covert writing for Medium in April 2019, gives some interesting insights into the extent of the problem, how it has been exacerbated by the pandemic and the grass roots response of some communities in the US[232].

Kristin Toussaint has written for Fast Company about how "since the pandemic began, American billionaires made an extra half a trillion dollars[233]" This summarizes and updates the results of a Billionaire Bonanza 2020 report[234] published in April 202 and co-authored by Chuck Collins, the director of the Program on Inequality and the Common Good at the Institute for Policy Studies. All of which is adding to a general sense of frustration. This issue of "what to do with the billionaires is trending". Lauren Martinchek provide further insights[235] into how frustration is building up in an article about the hoarding of wealth and what he refers to as "The Inherent Cruelty of a Billionaire Class."

The goal here is not to carry out an analysis of the problems that afflict society, but to demonstrate the range of forces that are rallying to reduce demand for non-essential, and even essential spending (rent, health care and healthy as opposed to cheap food) that will shape the business environment in which existing and future start-ups will have to fight to survive and prosper.

How Funds are Responding Now

Popular opposition to the idea of public money being used to support VC or PE backed companies, and a tendency by some commentators to characterize this as "bailing out the banks" requires a response. Without understanding how funds operate, it is easy to imagine piles of cash that should be deployed at a moment's notice in order to do what only seems right in a crisis. But reality is much more complicated than that. When a fund is being raised, the LPs commit their own money and that of their clients, to be invested by the GP on the basis of a well-defined strategy. This is formalized in a set of legal documents that provide the basis for the relationship between the LPs and the GPs and defines many aspects of the work that the GP is expected to do. The LP monitors the work of the GP and its concern is to make sure that the GP makes the best use of the money it has committed not only for itself but for its clients. The money is made available to the fund for a purpose that is more or less precisely defined, and subject to constraints laid out in the legal agreements. Furthermore, the fund to which the LP has committed, will be only one of many funds to which it has made a commitment.

As the GP selects companies in which to invest, it may make provisions for further investments in the portfolio companies, and of course for other companies which have not yet been selected. The GP usually has a good idea of what the money is for, and there is no "loose pile of cash" lying around.

If something happens, and one of the portfolio companies needs more money than expected, this may not be as easy as simply drawing down extra cash from the LPs. It will be especially difficult if the fund has already committed most of its resources to companies in its portfolio. This happens even in good times and fund managers have techniques that they can use to deal with the situation. But it is not a simple matter. The GP might suggest the creation of what are called "annex funds" to cover the needed cash. The GP may also ask LPs for what are called "recycling provisions" allowing the GP to make use of the proceeds of an exit event to be used to provide additional support to the remaining portfolio companies. They may go to the banks and borrow, making use of an increasing range of innovative financial products that have emerged to address exactly this situation, for example "revolving credit lines" and "asset backed credit facilities."

PE HUB wire has written about recent tensions between LPs and GPs and the onerous terms that GPs required in their proposals for recycling provisions[13] in order to either support older investments that needed additional capital in the downturn, or to find add-on opportunities at great value during the crisis.

This illustrates two issues. First that it is not fair to consider that investors do not care about their portfolio companies and are unwilling to invest in them in times of crisis. Secondly, that the provision of such support is it is not as straight forward a casual observers might think it should be.

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[13] Chris Witkowsky of Buyout Insider writing for PE Hub Wire on July 17, 2020.

A key issue in the context of the pandemic, is for investors to decide on a business by business basis, if something fundamental has changed either in terms of the business or in terms of the market it is supposed to address. Given the uncertainty that exists about the nature of COVID, the likelihood of our finding a vaccine and the possibility of achieving herd immunity, it is very hard to know if the changes wrought in the last three months are to become permanent or if there will be a gradual return to normal, it is very hard to evaluate the prospect for businesses that have so far been severely disrupted.

Making a Case for VC-Backed Enterprise Exceptions

There is evidence that VC-backing has a positive impact on technology start-ups all the way up to IPO. In terms of their propensity to invest in research and innovation, as well as in terms of the guidance they can give to founders.

The VC industry has played an important role defending the interests of founders, protecting their ability to pursue their vision, despite the tendency for predation by the PE industry and the increasing efficiency with which it can wrest control from founding teams, in many cases replacing the founding vision with in favour of business models that may ultimately weaken the businesses, reducing their resilience in the face of crises, and their ability to respond to rapid change in the business environment. This has led to a wave of innovation that the VC industry works with founders, startups, and early stage ventures, as well as innovation in the exit strategies and mechanisms.

The relationship between the high-tech start-ups, their private sector and public sector backers is quite complex one. It is not a simple progression from dependence on public money to dependence on private money. The financial trajectory of a technology start-up involves multiple rounds of grants, debt, and equity in a complex, organic sequence of growth-events, about which it is not easy to make useful generalizations.

This was made very clear in the examples explored with staff at Pitchbook. It strongly suggests a need to dig deeper into databases such as these, to better understand the financial trajectories of high-tech start-ups and the complex interactions between public and private sources of funding, on a sector by sector basis.

The need for the research funding of venture backed start-ups has always existed. Evidence for this is provided by the thousands of VC-backed companies recorded in the databases of professional service firms such as Pitchbook, that go on to apply for and win multiple rounds of public sector research funding. The importance of this for the VC world is reflected in the way that service providers such as Pitchbook assiduously record the entire funding history of the companies they follow, public money as well as private money, whether it takes the form of debt, equity, or grant.

The need will be only greater in the post-COVID Phase, given the way in which the pandemic has disrupted entire industries, calling into question the business models and markets on which they have been founded, and in which their VC backers have decided to invest.

The decision of founders and early stage investors are now in doubt, and all companies must now decide how to pivot or re-invent themselves for the post-COVID economies.

The situation of start-ups is fragile in the sense that their money is not “theirs.” It belongs to the LPs of the funds that have supported them until now. Those LPs must now re-evaluate their own positions, in other words the investment strategies of the VC funds to which they have committed. It is not so much that they will see less risk and uncertainty in the buy-out or acquisition of troubled assets. It is more like an opportunity for arbitrage among the early stage companies whose future now looks less clear, and re-allocation of funds within the VC world to sectors that now look more promising given the changes that have occurred since lockdown.

For the time being VCs are holding back on payments to their portfolio companies (drawdown) even if the drop in the number and value of new deals is not as severe as many might have expected. So, applying for research grants will become even more attractive as a source of finance, in order to occupy and retain key personnel, and for the purpose of helping to ‘pivot’ to a business model that will prove more robust in the post pandemic normal.

Annex 13: The Problem of Big Companies Pretending to be Small

The OECD on the use of Partnerships and Other Structures used to Commit Crime

In 2001, in response to a request from policy makers and authorities of OECD member states, the OECD steering group on corporate governance published a study on the use of corporate entities for illicit purposes[236]. The study refers to the fact that under certain conditions, corporate vehicles may be used for illicit purposes. It examines the nature of such illicit behaviour and explores mechanisms to prevent the misuse of corporate vehicles by ensuring that supervisors and law enforcement authorities may obtain information on the beneficial ownership and control of corporate vehicles. It examines the misuse of a variety of "corporate vehicles", including corporations, trusts, foundations, and partnerships with limited liability features. This last item is of relevance for this study because it is typical for a venture capital fund to be structure as a partnership with limited liability. Furthermore, there is tendency for VC funds to register in offshore jurisdictions such as Delaware of the US or Jersey of the Channel Islands.

The OECD report distinguishes between "effective control" as opposed to "legal control" legal control is exercised by the directors of a company. Whereas effective control may be exercised by beneficial owners, who may not even be formal shareholders of the company, acting via nominee directors (for example) who have delegated their duties to the beneficial owner. It points out that the directors of a corporation could merely be "nominees" who pass on the duties required of a director to the beneficial owner and accept instructions from the beneficial owner.

This is reminiscent of the language used as part of test of purity of the SME, to determine its size based on not only its own assets but on those of companies its controls or companies that exercise control over it. Nevertheless, the SME definition is not at all clear as to what kinds of crime or misuse it is intended to avoid. If this is indeed the intention. A clear statement on this would help in that it would provide a basis for stress testing any new definition that may be proposed.

Recalling that a partnership is an association of two or more entities formed for the purpose of carrying out business activities. As a general rule, the limited partnership is different from a corporation in that at least one of the partners (the GP) has unlimited liability for the obligations of the partnership. The other partners (the LPs) have limited liability on condition that they do not participate actively in management decisions or bind the partnership. These are the structures most commonly used for setting up VC or PE funds. So, the issue here is to see how they can be used in principle to commit crimes and to what extent is it likely that VCs or PE firms could be used as a cover for such crimes.

The range of white-collar crimes that can be committed and hidden with the help of offshore and complex corporate structures is very extensive. These include money laundering, bribery, tax avoidance, diverting assets, hiding assets from creditors, market fraud such as the illicit trading of shares, self-dealing and insider trading.

In general, partnerships do not appear to be misused to the same extent as other corporate vehicles. In a recent survey of corporate vehicles misuse in EU countries, no country mentioned partnerships as the most misused legal entity.

Recent Warnings from the FBI

In July 2020, Reuters[237] wrote of a leaked Intelligence Bulletin published by the FBI[238] on May 1, 2020, in which the FBI claims that hedge funds and the PE industry are being used to launder money. The report refers to "threat actors" which include criminals and "foreign adversaries" have been circumventing traditional regulatory mechanisms and AML (anti-money laundering) measures. The FBI bulletin provides examples of 4 cases where PE and hedge funds "have been used to facilitate transactions in support of fraud, transnational organized crime, and sanctions evasion." One of those cases, has led to a conviction. It concerns a $400M fraud based on an initial coin offering of a cryptocurrency called One Coin. Another involved the setting up of shell companies to disguise business transactions with countries against which the US had imposed sanctions such as embargos on trade in certain goods.

Corruption in PE

Mike Konczal writing for the New Republic[239] points to what he calls "astounding corruption in private equity." In 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act, required PE firms to register with

the Securities and Exchange Commission and submit to their checks, controls and oversight. This allows the SEC to examine the behaviour of private equity firms on behalf of investors.

Having completed a review of 150 firms, they found violations of law or material weaknesses in controls in over 50% of PE firms they had examined. These mainly consisted of violations in the way fees and expenses were handled by advisors to the PE funds. A typical trick is for the PE firm to fire the employees and re-hire them as consultants. The point being that the consultants are paid by the investors in the fund (the LPs) whereas the employees are paid by the GP out of their fee.

There are many other examples, but this is just to show that ethical behaviour cannot be taken for granted. Investors were criticized for not scrutinizing the behaviours of their GPs more closely. One of the biggest changes is the increased diligence on hiring of individuals, the checking of references and the carrying out of careful background checks. LPs and their sponsors now exercise greater diligence and oversight over their GPs and PCs. Thins have tightened up in the decade snice, thanks to the efforts of the SEC, but the incident is warning that wherever opportunity for fraud exists, there will be people ready to take it.

Cendrowski, Petro, Martin and Wadecki, authors of "The Handbook of Fraud Deterrence" believe that the opportunity for fraud and the pressure to act fraudulently is faced by those working in venture capital[240].

They note that there is a hierarchy among GPs based on their experience and track record. The top tier GPs enjoy returns that are significantly higher than the average, and there is competition among LPs to partner with them in a fund or as co-investor along with a fund they manage, in one or more of their portfolio companies.

They explain that this can lead to an LP agreeing to terms that are disadvantageous compared to those offered to other partners. This can be seen as fraud by disgruntled sponsors of the LP and can led to the sponsor bring a lawsuit for fraud against the LP.

Furthermore, as it is the job of the GP to select and manage the PCs and ultimately to ensure a good return to the LPs, once all costs including its fees and carried interest have been taken into account. A GP favouring one LP over another, claiming fees that are not seen to be justified based on performance, deviating from agreed investment policy or acting in its own interest to the detriment of an LP, can be seen as having acted fraudulently, and this can also trigger legal action.

When a fund (PE or VC) sells a PC to another company or fund, a lot of effort is required to establish the value of the company and negotiate a price. There is also a lot of opportunity to inflate the performance figures make the PC look better and more available than it really is. It can easily happen that after a company is sold, the buyer finds that the company does not offer the performance expected and it may even uncover evidence that the figures for sales, growth etc. have in fact been inflated. The existence of commissions and performance-based pay for corporate entities and individuals involved, only adds to the temptation. In any case it is common for allegations of fraud to arise. These issues are real, and common and rarely go to court. In the US at least they are usually settled out of court and the details are kept confidential. To illustrate quote the case of Abry Partners versus Providence Equity[241].

Fraud Perpetrated by VC firms

Wherever there is money, there is fraud. Especially where you have highly leveraged actors with lots of money, helping out actors with no money and no experience. A lot is written about the kind of "fraud" perpetrated by wily funders on clueless startup founders.

Most of what is described by some as "fraud" committed by VCs on founders or potential portfolio companies, often comes down to violations of trust, ethical shortcomings, or violations of f act in the interest of partners or clients. In many cases these can be summed up as violations of confidentiality or of fiduciary duty.

- Feigning interest to gather information or stall a company when the funder has no intention or even means to fund company
- Favouring one portfolio company over another because of differing values or stakes or personal holdings
- Conflict of interest Forcing actions that are good for the investor but bad for the founder
- Pocket-lining by monopolizing advisory and board roles to obtain fees, by manipulating participation rights or other sweeteners for personal gain

- Creative accounting for example overvaluing a start-up to make it uninvestible by others for follow up rounds, increasing the leverage that the original investor has over the start-up
- Bad faith uses of small investments, often through business angels, to obtain information about competitors or alternative investments…

These are to be distinguished from scams perpetrated by intermediaries and actors outside the VC community, often by well-meaning but clueless individuals who do not realize what they are into …

- People who provide introductions for a share of equity or exorbitant fees. In most cases they are not able to deliver and the remuneration they expect has no bearing on the value they bring
- Unwanted middlemen who pretend to have money or represent a fund, where they are just hustlers trying to take a slice out of a deal
- Unlicensed broker-dealers and funds, pretend syndicate leaders, trying to inveigle their way into a deal, looking for shares, fees, or kickbacks in return for services.
- Want-to-be venture capitalists. Apparently there exists a category of actor who has no funding but goes so far as to open an office, set up a website and pretend to be an investor going all the way up to signing deals, but then the money never comes!
- Saboteurs who get in on deal who then want to micro-manage it, brow-beating founders for not growing quickly enough, using veto rights to frustrate the founders and brow beat them into don things they would not normally do.

These scams may happen by otherwise well-meaning actors, even public sector actors as outlined in the prize winning "Boulevard of Broken Dreams" by Josh Lerner[242].

That aside, it should be clear by now that there are real tensions in the relationships between PCs, LPs, and GPs, that even the best made contracts, monitoring control and governance systems cannot avoid.

The possibility of things going bad with the VC or investor, may be exacerbated by the rise in "tourist investors," private corporations awash with cash that want in on VC and PE deals because the returns on those are (have been) far superior to what is available from other kinds of financial investment activity.

Many of the things that go wrong, are the result of misunderstanding, self-delusion, and narcissism rather than criminal intent. A report by CB Insights helpfully provides 16 cases of VC fraud[243]. These include:

- **Theranos,** a start-up that tricked even Henry Kissinger, raised $1.1B in start-up funding for a revolutionary product that was basically a lie. Along the way it faked its research results, faked its products and service, put patients' lives at risk, and destroyed the careers of employees who tried to blow the whistle.
- **Hampton Creek,** an alternative protein company, which used investors' money to buy its own merchandise, so as to inflate its own sales figures and achieve performance targets.
- **The Honest Company**, founded by none other than Jessica Alba, managed to raise $490M to produce and sell "natural" products that contained no synthetic materials. Unfortunately, it was found to use fraudulent labelling and by independent testing that all of its products without exception contained synthetic chemicals some of which were toxic.
- **Asenqua Ventures**, a venture fund set up in 2011 by an MIT alumnus called Albert Hu. Hu defrauded his investors and was convicted on 7 counts of wire-fraud in 2013 after extradition from Singapore and was jailed for 12 years. The company popped up again in 2015. It is currently described by Crunch Base as a "Silicon Valley venture fund" specialized in seed, startup, and early stage ventures. Crunch Base also notes that it closed in 2016 and appears to be a shell firm with fake employee profiles.

This last example of a "shell game" disguised as a VC firm is useful to know, as it responds to a remark made in relation to a US challenge to the SBA definition of a small business, in particular an attempt to create an automatic exemption for access to SBA funding by venture backed small firms, described elsewhere in this paper.

Annex 14: Further Notes on the SBA, Size Standards and COVID-19

The Origins of Small Business Size Criteria in the US

US government assistance to small business has a long history. The basic program is a program of "small business set-aside," one that evolved from the need of government to secure supplies of essential goods in war-time, into a program intended to support the growth of new business as a creator of jobs, a source of innovation and as a source of competitive pressure that should reduce the cost of government procurement.

For obvious reasons, the existence of such a program has been opposed by large business, which has been creative in finding ways to work around the rules and win back what it sees as lost business it has lost to up-starts (as opposed to start-ups). The strategies include simple collusion with small businesses, to buying up small business that have won set-aside contracts, to simply ignoring the rules by exploiting mechanisms for self-certification and pretending to be smaller than they are.

This is worth dwelling upon, because it sheds light on the need to add criteria to the formal definition of small business, based on notions of independence and autonomy, or ownership and control, a subject to which this article will return.

The issue is controversial and highly politicized. It has a technical dimension but is not merely technical. It is easy to imagine how large business would go to great lengths to claw back any "rights" to contracts that it considers it may have lost due to the small business act of 1953 and to the creation of the Small Business Administration in 1958. There is a literature that questions the value created by the set-aside program, and the homepage of the American Small Business League[244] refers to the attempts made during the Bush and the Obama administrations to eliminate the SBA, creating a situation which they believe would inevitably lead to winding down of all small business support programs including those for small business set-aside.

Nevertheless, small business does have its friends in politics. In particular Claire McCaskill, until recently a democratic senator for Missouri, has studied the effectiveness of the set-aside and the fairness of its implementation. Her finds released in 2006, provided evidence of failings in the system, in particular a failure to meet targets by federal agencies, a lack of enforcement by the SBA, and the use of a major loophole allowing big companies to pose as Alaskan Native Companies and benefit from exceptions to the rules, allowing them to win contracts set aside for small business. It took until 2011 to have this heard[245] and the debate goes on, but so far in any case, the SBA and the small business set-aside programs have survived.

A useful summary of the history of small business set-aside, how it emerged and evolved to where it is today, is provided by John Mark Clapp in an article entitled "Are Small Business Set-Asides Successful?"[246] The story as it is told by Clapp, starts in 1929 with the establishment of the Reconstruction Finance Corporation, by President Herbert Hoover, in order to help large and small business affected by the depression. In 1942 the Smaller War Plants Corporation was created along with the Small Business Mobilization Act, enabling small businesses to compete against large businesses and win public procurement contracts. This was motivated by a desire to ensure security of supply of goods, technologies and services needed for the US to fulfil its military ambitious. In 1947 the Armed Services Procurement Act extended the Small Business Mobilization Act by requiring that a "fair" share of federal contracts should go to small businesses. In 1950, the Defence Production Act was passed during the Korean War, to encourage domestic production to meet the needs of the war effort and maintain the viability of small businesses during difficult times. Support for small business started to take on its modern form with the creation of the Small Business Administration or SBA in 1953.

The SBA negotiates and agrees individual agency goals with 24 federal agencies[247], with a view to achieving in aggregate the overall federal government goals with regard to the use of small busines set-aside. These goals are published every year and the SBA is charged with monitoring progress and evaluating the performance of each agency in terms of its ability to reach the agreed targets. Its annual assessment is summarized in the Small Business Procurement Scorecard[248] it compiles for each agency on an annual basis.

Over the years the work of the SBA has evolved to go beyond small business set-aside for prime contracts, to include set aside whereby large companies would be obliged to involve small business as sub-contractors. Nowadays the official target is that up to 23% of all federal contracts (about $450B a year), should be awarded to small business. Of this 5% is reserved for Small Disadvantaged Business, 5% for Women Owned Small Business, 3% for small businesses owned by service-disabled veterans and 3% for businesses operating in Historically Underutilized Small Business Zones, so called HUBZones.

The SBA has also grown to design and run programs intended to encourage the participation of small business in federally funded research, namely the SBIR and STTR programs. In 2020 the SBA was mobilized to

assist small business in the response to COVID-19 by helping in the administration of the PPP or Pay-check Protection Program.

The SBA not only runs and monitors these program, but handles technical issues related to program design, including the determination of size criteria. One of the most important tasks in this regard is the determination of the definition of small business which since 1958 has been outlined as follows:

- independently owned and operated
- not dominant in their field of operation
- and meeting certain criteria in relation to their "size."

This definition leaves great scope for interpretation, and explicitly instructs the SBA to clarify and regularly revise the definition, giving scope for variation by sector, and over time, for example in line with indices for inflation or industrial productivity.

Debates Concerning VC-Backed Companies in SBA programs

The United States' Small Business Innovation Development Act of 1982[249] established the SBIR (Small Business Innovation Research) program, to be overseen by the SBA and managed by federal research agencies of a certain size. The goal of the program was to stimulate technological innovation by using small businesses

- To meet federal R&D needs, and
- To increase the commercialization of innovations derived from federal R&D.

Over the first two decades of operation of the SBIR programs a number of VC backed companies took part in the program. According to an evaluation by the national Academy of Sciences[250], they did so without any "apparent adverse consequence for the program's operation and achievements." Nevertheless, an administrative law judge ruled for technical reasons that businesses that were majority held by venture capital operating companies did not satisfy the conditions for eligibility, and such businesses were henceforth excluded from SBA programs[251].

The transcript of a hearing[252] on "The Role of Small Business in Innovation and Job Creation: The SBIR and STTR Programs" which took place in Washington on March 31, 2011, provides some insight into the intervention logic of the SBA and concerns to which it must respond in the design of its small business programs.

One of the stakeholders called to testify at the hearing was Doug Limbaugh, CEO of Kutta Technologies Inc., a company he co-founded in 2001, which had benefited over the years from 13 Phase I, and 11 Phase II SBIR grants for a total of $8.5M. His company is in the defence field and he provides a good example of the kind of impact that the program aims to achieve. In particular the program wants to ensure a good supply of innovative new companies able to build and deploy technology intensive products and services for the US defence efforts. Limbaugh's company is a poster child for the program, and it won a number of important contracts which enabled it to grow. In his testimony[253] he did not favour the idea of allowing venture-backed enterprise having access to SBIR funding on the basis that large prime contractors might set up shell VCs as a front to get access to the SBIR grants. His fear was that if they were to do this, they would divert resources that had been set-aside for small business, for the ultimate benefit of large corporations hiding behind those funds. When asked by the moderator if he was aware of any case where this had happened in the past, to which he replied that he was not aware of any such case.

The point of the anecdote is to show that many of the fears that are addressed by overly complex rules, might not exist in reality. It is hard to imagine a large corporation going to great lengths to set up a VC shell and then faking a portfolio company and all of the activities which must be funded to establish its credibility as an actor in the space, and then submitting itself to the rigors, delays and other constraints of a publicly funded program in which it has a limited probability of winning a modest amount of money.

In 2011 the Reauthorization Act[254] amended the rules of participation to allow the participation of small businesses that are majority owned by "multiple venture capital operating companies, hedge funds, or private equity firms." It delegated authority to the federal agencies to allow the participation of such companies should they choose to do so. This is generally referred to as "5107 authority" a reference to the corresponding section of the act. This was done in the belief that this would encourage further investment by venture capital, hedge fund, or private equity firms, in small business innovation.

To get a feel for the program it is useful to note that the SBIR provides R&D Grants for so called

- Phase I projects with a value of about $150k and a duration of 6 months
- Phase II projects which build upon the results of Phase I projects, with a value of about $1M and a duration of up to 2 years.

In 2017 for example 11 federal agencies took part in the SBIR program. They made about 4,800 awards in that year with a combined value of almost $2.3B.

The reauthorization act made provision for the Government Accountability Office[14] to evaluate the impact of the 5107 authority and submit a report to congress every 3 years. In November 2014, the GAO carried out its assessment on the impact of the amendments based on data for years 2013 and 2014. In December 2018, the GAO published its second evaluation report which included results based on the years 2015 to 2018[255].

Only a few of the federal agencies chose to employ the authority. Those that did not gave variety of reasons for not doing so

- Many believed that opening their programs to such small businesses would not substantially contribute to the mission of their agency.
- Some declined because they did not know the level of interest that this would present
- Some believed that such companies are really like big businesses and do not need the funds, and that funding them would divert funds from more deserving cases.

It is interesting to note that these positions were based on personal opinions. In any case the evaluators did not report on the scientific basis provided by the informants during the interviews they conducted. No one who was interviewed expressed a concern that the VC or PE funds would commit fraud of any kind or divert SBIR money for their own "nefarious" purposes.

The Department of education was at first going to decline the use of the authority but changed its mind after it received inquiries from venture backed companies. The most enthusiastic adopter was the NIH, which made awards to small businesses that were majority-owned by multiple investment companies and funds in all years of the review, including 60 awards for a total of over $43M in the period 2015 to 2018.

Not all such companies that applied were successful. In the case of NIH of those that were majority-owned by multiple investment companies and funds, 13 of 20 such applicants were successful in 2016 and 27 out of 33 such applicants were successful in 2017.

Although the level of interest from and participation by such companies remains low, the suggest an upward trend over time.

The Impact of COVID-19 on SBA Size Standards

The COVID-19 pandemic has had a very significant impact on the US economy. Many businesses have been forced to shut down and-or lay-off workers either on a temporary or a permanent basis.

Drastic measures have been taken to help companies go on standby while waiting for conditions to improve, and to maintain employees on payroll, despite the collapse of the markets they operate in.

The most important measures (as of the time of writing) intended to help small business are:

- The Pay-check Protection Program or PPP, section 1102 of the CARES Act, and
- The Loan Forgiveness Program, section 1106 of the CARES Act

To qualify as being eligible for assistance under these programs, the SBA provides a number of options to determine the size of the business. Modulo affiliation rules, these are

- The businesses must have 500 or fewer employees (with no financial constraint)
- The business must meet the SBA size standard for the industry sector in which it operates. Depending on the sector in question, this is either a headcount-based standard or a revenue-based standard.

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14 GAO

- The alternative size standard, published by the SBA on April 6, 2020. In which case a firm can qualify as a small business, eligible to receive aid under the PPP, if it satisfies two financial criteria, that its tangible net-worth is not more than $15M and that its average net income after federal income taxes for the past two fiscal years are not more than $15M.

To qualify a company has to satisfy one of those criteria, not all at once. It is quite possible for a company to fail on one of those criteria and qualify on another.

This situation has caused great controversy in the sense most PE firms would qualify for assistance on the basis of the headcount criterium despite have hundreds of billions of dollars under management, and key personnel earning salaries very high salaries even before bonuses kick-in. Even for those businesses which might find it distasteful to apply for relief intended for small business, they arguably have a fiduciary duty to their shareholders to do so anyway. This has made for some interesting headlines. I don't analyse these here except to mention it in passing and use the anecdote as an opportunity to repeat that size standards depend on many things and that context and clarity of purpose may be most important consideration for programs intended to serve the SME sector.

These efforts have been highly controversial. They involve a lot of money, being given to a lot of companies in a very short time.

Some well-funded companies with large reserves and strong balance sheets applied for this money and were later forced by public pressure to give it back. The popular press had a field day, seeing this as yet more evidence of corporate greed. The reality was more complex in that companies were faced with a dilemma in knowing how to act in the face of great uncertainty, and managers would have been aware of the possibility that they could be accused of a dereliction of their duty towards the company they manage, should they neglect to apply for this money on the basis of "just in case things got much worse."

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KJ-02-20-227-EN-N

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doi:10.2760/602855

ISBN 978-92-76-28301-0