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SCIENCE AND TECHNOLOGY POLICIES RESEARCH CENTER
TEKPOL Working Paper Series
STPS-WP-22/01

The Role of the Policies Shaping the VC and Growth in Europe

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Abstract

Venture capital has been gaining importance in recent years and became an issue that is discussed by both economists and politicians often. The paper aims to discuss the role of policies in the development of venture capitals (VC) and examines the effect of venture capitals on the economic growth of European countries. It provides a wide range of literature frameworks about past policies and their importance on economic growth and VC besides giving data on individual investment rates for specific European countries, how these investments are fundraised. Further, it is aimed to criticize those policies to provide a clear framework that reveals the shortcomings of those policies as well as their good aspects.

Introduction

In recent years venture capital is seen as one of the primary reasons underlying economic growth by economists, businesspeople, and politicians. Venture capital businesses devote considerable management resources to exploring new technologies and markets, identifying promising startups in such fields, providing financial resources, and guiding them in their initial phases. Access to traditional financial sources for a startup is frequently hampered by severe information asymmetry and excessive unpredictability. Venture capital firms, on the other hand, have the essential skills to cope with these issues and contribute to startup management (Davila et al., 2003). Even though the venture capital sector in Europe began much later than in the United States, its impact on the overall economy is considerable. According to a study conducted on venture-backed companies by the EVCA (European Private Equity and Venture Capital Association), 94.5 percent of startup firms could not exist if they had not received venture capital finance, and 89.7 percent of them had increased the number of workers after the VC investment (EVCA 2002).

Public policies share the same goal with VC in terms of achieving economic growth. Therefore, the importance of policies on the development of VC and on economic growth becomes an important issue that needs to be discussed. Like any government around the world, European governments have been trying to achieve the success of the US in their own countries. There are some policies determined by economic research as possibly advantageous for the establishment of active venture capital markets. Innovative start-ups face credit limitations, which are extremely serious for early-stage and high-tech enterprises, and this can be alleviated by governmental policies that boost the number of funds available for those enterprises' investment. This would increase venture capital investments in early-stage and high-tech enterprises, resulting in improved innovation ratios. (Da Rin et al., 2006). Policies that help to improve R&D and technological developments and policies that lower the tax on investors are also advantageous for the development of venture capitals.

This study aims to provide an outlook that reveals the impact of Venture Capital (VC) on economic growth with the framework of policies developed in Europe. In the literature review part, we aimed to give a historical framework about how venture capitals were founded and how they affect startups. Then, literature about European policies that are important for VC development and the role of those policies on growth is revealed. In the second part, we have created data that shows the VC investment for start-ups, early-stage, and later-stage firms for 16 European countries. (Austria, Germany, Portugal, Belgium, Italy, Spain, Denmark,

Luxemburg, Sweden, Finland, Netherlands, Switzerland, France, Norway, United Kingdom) Hence, sources of VC fundraising for the EU are essential for our analysis and be placed in the data part with the relevant data for growth. In section three, we have made a discussion on what we have found in the literature and the data. Our focus was more on governmental acts related to public policies and differences that result from those policies between Europe and US.

Literature Review

Venture capital is so well-known in the startup world that it's easy to forget how it got started and why it's so focused on financing startups. The roots of the venture capital go back to WW2 when the American Research and Development Corporation (ARD) was established. The influx of innovation generated by US venture capital funding and the financial performance recorded by this industry has led to the internationalization of venture capital applications (Cressy, 2006) Therefore, the development of venture capitals in Europe is much newer compared to the US. Its arrival to Europe is said to be dated to the beginning of the 1980s, but because of insufficient tax and legal incentives, it started to gain momentum in the second half of the 1990s (Dubocage and Rivaud-Danset, 2002).

It is necessary to look at the evolution of the European venture capital industry and its structure to make a correct assessment of its contribution to the creation of innovative companies. Investment rose dramatically in 1997, and the pace of disbursements quickened in 1999, near to the influx of fresh capital, after first developing slowly until the mid-1990s. The positive trend observed in the EU reflects an improvement in the political, fiscal, and entrepreneurial environment, as the growth of SMEs, particularly in high-tech sectors, has been viewed as a critical component in maintaining the European economy's competitiveness. Several governments and European institutions have implemented venture capital promotion schemes in order to attract investment in this category of firms. Schemes based on direct state intervention in the venture capital market include the establishment of state-sponsored venture capital funds or measures leading to direct state intervention in the market, such as the establishment of public incubators while indirect intervention in the venture capital market refers to schemes aimed at improving the infrastructure of the venture capital industry (Constantin, C., & Olivier, D.,2001). Firms in the EU countries received varying absolute levels of VC investment. The majority of investments are concentrated in a few countries, primarily the United Kingdom, France, and Germany, but over time, the number of countries receiving VC investments has begun to rise.

Further, to make a clear understanding of European venture capital development it is useful comparing some features with the US because US venture capital is by far the most developed and the oldest. While institutional investors are the largest contributor to venture capital in the US alongside individual investors and realized capital gains, European venture capital is dominated by funds from financial institutions (mainly banks) that still hold the largest source of funds (Bottazzi, L., & Da Rin, M.,2002). In both countries, most of the funds go to expansion investments. Furthermore, higher variability in investment patterns in Europe can be interpreted as a sign of the industry's immaturity, as it still needs to find a stable structure. The difference in venture capital activity between the United States and Western Europe is significant; Europe has roughly one-fourth the amount of activity as the United States (Dubocage 2001). The characteristics of the American innovation model are not found in Europe, where the innovation system is not conducive to the emergence of new, purpose-built firms. The European innovation model is based on the diffusion of new products rather than their creation. Therefore, this is reflected in the poorer financial performance of European technology-based small firms (TBSFs) (Dubocage and Rivaud-Danset, 2002).

When discussing small technology-based businesses, it is also necessary to discuss start-ups and the role of venture capital in their development. Start-ups encounter difficulties with financing because banks generally refrain from investing in them. Banks specialize in accepting public deposits, lending these funds to businesses, and earning interest margins in the process. Due to the high liquidity of deposits, loans should only be made to businesses that are likely to repay in a relatively short period of time and with a high probability. Banks rely heavily on a firm's tangible assets for collateral as well, but the assets of entrepreneurial start-ups are mostly intangible, such as marketing knowledge or technology. This is where venture capitalists come in. Venture capitalists are professional investors who raise funds from wealthy individuals and institutional investors and invest on their behalf through small, limited partnerships, and their area of expertise is young firms that have a high potential of earning, namely, start-ups. Therefore, the growth of start-ups heavily depended on venture capital investments and indirectly dependent on the policies that are made in that area.

Lerner, Moore, and Shepherd claim that “It is instructive to observe that all venture capital markets of which we are aware were initiated with government support. These markets do not appear to emerge without some form of assistance. This leads to the question as to what it is that requires the need for government support in these markets, at least in their formative stages” (2005). The researchers in the quoted above paragraph claim that although venture capital is

associated with entrepreneurial representatives that are not restricted by public interference, governments can play an essential role both in launching venture capital programs and in establishing such activities and providing a facilitating environment for commercial growth (Murray, 2007).

Governments aiming to develop an inventive economy are increasingly turning to venture capital especially in the aftermath of the global economic catastrophe. They are practically compelled to do so, as global banks appear to be even less willing to make risky investments, and stock markets are becoming less dependable sources of corporate funding for innovation (Lerner, J., Leamon, A., Robles, G.A., 2021). The need to turn to venture capital to incentivize the economy is also evident in the European Commission 1998 report, as well as in the Regulation of European Securities 2001 report. In both of the aforementioned reports, the urge to the government and the European institutions to give more attention and establish an environment for the expansion of the supply of risk capital for developing companies is apparent, considering that they are a crucial part of the economy for job creation (Bottazi, L., Da Rin, M., 2002).

The broad economic literature has demonstrated that a country's formal and informal institutional qualities define the "rules of the game" that economic agents must follow. Both categories of institutions have been demonstrated to have an impact on entrepreneurship and innovation activities, therefore they appear to be important when looking at VC activity across various geographic areas. (Grilli, L., Mrkajic, B. & Latifi, G, 2018). As factors of VC activity, the entrepreneurial finance literature has looked at four major characteristics of the institutional framework that set formal boundaries for entrepreneurial and financial activities: (i) regulations and contractual norms that apply to a wide variety of laws; (ii) governmental quality and political conditions; (iii) financial market structure and development; and (iv) macroeconomic conditions. All of these factors are thought to have an impact on the venture capital industry by generating (or introducing) hurdles and possibilities for inventive entrepreneurs (i.e., the supply side of the VC industry) and institutional investors (i.e., the supply side of the VC industry) (i.e., the supply side). Above all, well-developed formal institutions can reduce transaction costs and the constraints associated with information asymmetries, two of the most serious hurdles to entrepreneurial financial activity that result in adverse selection and moral hazard difficulties (2018).

Now that the impact of policies in venture capital investment has been analyzed, the next section of this paper will provide a thorough analysis of how policies in Europe have developed

throughout the years and how that has influenced the growth of venture capitals. As mentioned in the first paragraph, the establishment and development of venture capital in the EU are much younger compared to the US. The disparity between European and American markets could be explained by several historical events. One of the main problems was that of tax disparities between Europe and the United States. Higher capital gains taxes in Europe, wealth taxes on the value of shares in some countries, and harsher regulation of private R&D investment all raise the cost of venture capital and hinder its development. The United States and the United Kingdom have far more favorable tax rules for business development in general and venture capital in particular (Dehesa, 2002)

In December of the year 2000, The Heads of State and Government of the 15 EU member nations described entrepreneurship as a crucial component of EU employment policy during the Nice European Council. The fundamental component of such a policy is the formation of a venture capital industry. The first steps of this policy were acquired from the 1998 proposal of the European Commission when it proposed a Communication to the European Parliament entitled "Risk Capital: a Key to Job Creation in the EU." Because of the aforementioned Communication, two plans emerged regarding the venture capital policies: the Risk Capital Action Plan, which was included in the original Commission Communication, and the Financial Services Action Plan, which was adopted in May 1999 (2002). By 2003, the Risk action plan was implemented, and by 2005 Financial Services Action Plan was implemented. There were four areas of action for them to be implemented; the first was to take steps to strengthen financial market convergence. The Euro was a significant step forward since it removed currency rate risk among participating countries. Another was the establishment of the Committee of Wise Men under the presidency of Alexandre Lamfalussy. Updating directives relating to the issuance of a "prospectus" for public stock offerings is one of the most tangible reforms proposed in these 26 areas. This was designed to make it easier for all member states to raise money by lowering transaction costs, simplifying international procedures, and introducing "shelf registration"(2002). The last phase would divide the prospectus preparation process into two parts: a generic or "reference prospectus" for raising money that will apply to all capital markets, and a second prospectus that will be tailored to each individual issuance. Other initiatives included examining corporate governance rules in member nations and implementing shared best practices. At that time, it was also being considered whether all publicly traded EU corporations should produce their consolidated financial statements using international accounting standards (IAS). A proposed rule would create a European patent,

delivered by the European Patent Office and valid throughout the EU, which would provide complete legal protection. However, the differential tax treatment of venture capital markets was a key topic of structural reform, and numerous modifications were considered. In the beginning, there was a plan to propose lowering capital gains tax rates in order to boost after-tax returns on capital market investments. Additionally, by assuring equal tax treatment of equity and debt, the enormous tax bias in favor of debt and against equity issuance would be eliminated. Finally, the last policy objective was tax reform to encourage entrepreneurship by lowering corporation tax rates and providing more favorable tax treatment for business formation and stock options as a form of compensation for firm leaders (2002).

However, the recent developments in the EU include two levels of governance that are at work to promote the VC industry. National governments give money through their national promotional institutions (NPIs), such as the KfW in Germany or the Bpifrance in France, and they employ tax incentive programs to decrease the riskiness of VC investments for private investors in Europe. The European Investment Fund (EIF) also intervenes in the VC sector on a European level. Furthermore, the European Commission finds and promotes best practices for cross-border investments that are hampered by differing tax regimes or regulatory requirements. (Stander, P., 2017). The EU enacted the Regulation on European Venture Capital Funds (EUVeCa) in 2013 to advance towards a pan-European venture capital market. It establishes a new "European venture capital fund" label and new procedures to allow venture capitalists to sell their funds across the EU under a single set of criteria. They are trying to help SMEs and small mid-caps access venture capital through a variety of programs under the 2014-2020 Multiannual Financial Framework. From the seed stage to the development stage moving to the growth stage, the Single EU Equity Financial Instrument promotes European enterprises' growth, research, and innovation (R&I). There is also an equity instrument available through the European Fund for Strategic Investment (EFSI). By investing in VC Funds-of-Funds, the Pan-European Venture Capital Fund-of-Funds program (VentureEU) intends to close the equity gap in Europe. The European Scale-up Action for Risk Capital (ESCALAR) initiative is a risk/reward mechanism for scaling up businesses utilizing venture capital and growth funding. It was also initiated the capital markets union effort in 2015 to open up new investment opportunities, including for SMEs, and to diversify funding sources. Several initiatives, particularly those relating to venture capital, were taken to solve the so-called "funding escalator" problems. They, also, produced research in 2017 to review existing tax incentives for

venture capital and business angels, analyze and appraise potential new scheme designs, and give policy recommendations for the future (European Commission, Venture Capital).

As another point for policies, it is important to mention the general aims of programs in 2020 in the EU. The biggest step to be taken under this heading is Horizon 2020. It is the largest European funding program for innovation. The EU created the Horizon 2020 program as a cooperative financial mechanism to help Europe maintain its global competitiveness in innovation. The general aims of Horizon 2020 include ensuring that Europe's science is of global quality, removing obstacles to innovation, and making it easier for the private and public sectors to collaborate on innovation (UKRI, 2020). The EU is contributing €410 million in independently owned venture capital funds as part of Venture EU, with €200 million coming from Horizon 2020 (Maensam, 2018). To achieve the given aims European Investment Bank created the InnovFin. The goal of InnovFin is to make it easier and faster for innovative enterprises and organizations in Europe to get funding. InnovFin helps projects that are riskier and more difficult to appraise than typical investments, and so have a harder time getting funding (EIB, 2022). In the light of this program, the European Union broke a record in VC investments in the third quarter of 2020.

The distribution of venture capital in Europe is substantially uneven. Five nations (in order of importance: the United Kingdom, France, Germany, Italy, and the Netherlands) accounted for 83 percent of the total cash generated by the EVCA membership (ECU 46'7 billion). The United Kingdom is Europe's oldest and biggest center of venture capital activity. It accounts for 45 percent of total funds, which is more than double the amount of its next rival, France (ECU 10'6 billion). At the sub-country level, the significant geographical differences in venture capital provision between the European Member States are reflected. Venture capital businesses are concentrated in places with both established financial centers and substantial economic activity concentrations. Because of the information and governance benefits of being near to investors and investees, money is predominantly dispersed within these clusters. The empirical research all agrees that venture capital availability and use are concentrated in areas with a long-standing and expanding economic advantage. Concerns over the apparent scarcity and regional dispersion of third-party equity funding for European NTBFs prompted the European Commission to take action. As a result, the Commission decided to implement a Community pilot project to boost seed capital. The Scheme's declared goals were to facilitate the enterprise creation in the community by providing funds that will improve and strengthen the financial opportunities of the projects of enterprises by the creation of 24 new seed capital funds. By

offering monetary motivations to these new assets, this pilot drives endeavors to help the private area and start-up speculation. Over a three-to-five-year period, each of the scheme's sponsored funds got a reimbursable, interest-free advance of up to 50% of the fund's yearly operating costs. This loan will be due for repayment after ten years when sufficient investment realizations will have been realized to allow the advance to be repaid. Those funds that have not generated net investment returns greater than a 'hurdle' (linked to long-term treasury bonds plus five percentage points throughout the course of the fund's existence) will be exempt from repaying the loan (2002).

Innovation policies have a strong effect on economic development and inclusive growth. A study by Hasan, I., et. al shows us high patent quality and higher economic growth are strongly related (2010). In European countries, when we look at Continental Europe, their policies are more social and state incentives with respect to the US and UK. Efficient innovation policies and the rise of venture capitals relatively late in Continental Europe because regulations generally focused on individual and social security rights and entrepreneurs did not move like US entrepreneurs. Growth and development in capitalism are more related to innovation and creative destruction, in the middle of the 20th century, Schumpeter was aware of that reality, and he tried to fund entrepreneurs in those years (Schumpeter, 1911). McGlue discussed public policy for funding venture capitals in Europe, how they can be funded, what incentives give them, when governments intervene in these situations, what are the government’s policy implementations and what tools they have in order to apply policies (2002). The early 2000s are relatively early for European countries to understand the importance of these policies. Active transformation of China and huge tech companies of the US give some insights to Europe. Growth dynamics change over time and some research shows us direct and indirect effects of venture capitals have some solid stimulation for growth and development. In their analysis, Pradhan, R. P. et. Al, found a strong causal relationship between venture capital investment, information-communication technology infrastructure, and economic growth, their study period is 1989-2016 and it is important because in those years financialization oriented policies are made from governments, free-market regulations held in that continent, and it is also important because we were facing the global crisis (Pradhan, R. P. et. Al, 2019). Major significant clues for economic development are the ratio of high-tech companies in the countries and when we look at increasing policy incentives for venture capitals, high tech entrepreneurial companies increased in Europe (Grilli, L., & Murtinu, S, 2014). Sustained economic growth is provided with venture capital investments and it is located endogenously in the growth process.

Pradhan, R. P, et. al shows this relation under innovation, financial markets, growth, and venture capital investments with the analyzing 23 European countries panel data between 1989-2015 (2018). Finally, one other aspect of this growth process is shown under information production. Venture capital helps decrease valuation uncertainty within public equity markets and it is beneficial for stock market development (Obrimah, O. A., 2016).

Methodology

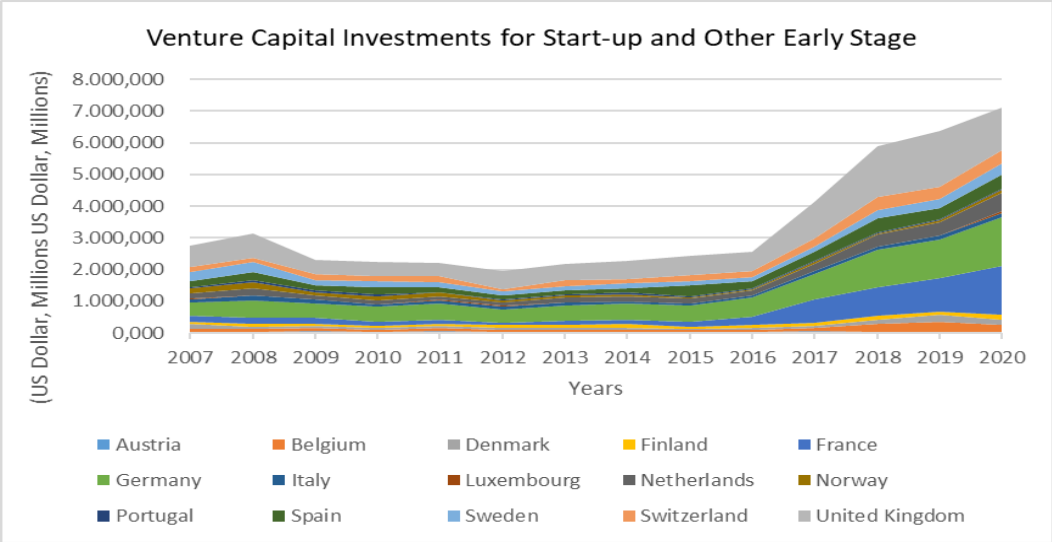
In this paper, the aim is to look at the venture capitals' impact on economic growth in European countries. With this purpose, we aimed to look at the venture capital investments in major European countries and explain their relationship with growth while considering the effects of policies that are conducted in given years. For Venture Capital investments, we used the data of 16 European countries by making use of the OECD database. Our study covers the years 2007-2020. The data that is taken from OECD is measured under current prices, USD, and the units of the data are in terms of millions in US dollars. In addition, to make a clear framework, we conduct two different analyses: the first one is for the start-ups and early-stage ventures, second is for later stage ventures.

It is worth mentioning that there are no official VC statistics since VC companies are not required to report their activity. All accessible VC data sources are based on VC companies' voluntary announcements or data providers' market monitoring. As a result, VC activity varies depending on the data source.

Looking at patent numbers, after the process of funding to understand effects, patent quality is an important determinant to see VCs effects. Innovation activities and their relationship with startup establishments are also good indicators. Starting business rates of males and females could provide us to understand development indicators for countries.

Data Analysis

Figure 1:



In order to show the differences in investments clearly, we have used a stacked area chart. As can be seen from Figure 1, the United Kingdom, Germany, and France leading the way in venture capital investments for Startups and early-stage ventures in Europe. Venture capital funding of the early stage is designed for enterprises in the development stage. While UK's and Germany's venture capital investments were high from the beginning of 2007, France's action accelerated only after 2016. For all countries that we have included the research, it is clear that there is an increase in the volume of venture capital investments after 2016, especially for the UK, France, and Germany. There are some comments explaining the reason for this increase, increase in competition in early-stage VC. The network of incubators and co-working environments, paired with crowdfunding portals, raises the visibility of new startups. Add to it the fact that Silicon Valley's exorbitant values encourage investors to avoid the West Coast. Many of the most well-known investors, such as Andreessen Horowitz and Google Ventures, have stated that they no longer want to execute early-stage deals because tiny investments do not move the needle for their massive funds. Smaller, less well-known funds will have to work harder in 2016 to distinguish themselves. The stakes in the race for differentiation among early-stage VCs are high (Calhaun, 2015). The lowest investment volume is in Luxemburg for all years and Portugal follows Luxemburg with the second-lowest capital venture investment rates. However, it is important to note here that we are looking at the investments as millions of dollars

in total. If GDP is considered, the percentage of VC investment made by countries like the Netherlands and Luxemburg is not that small compared to their total GDP.

Figure 2:

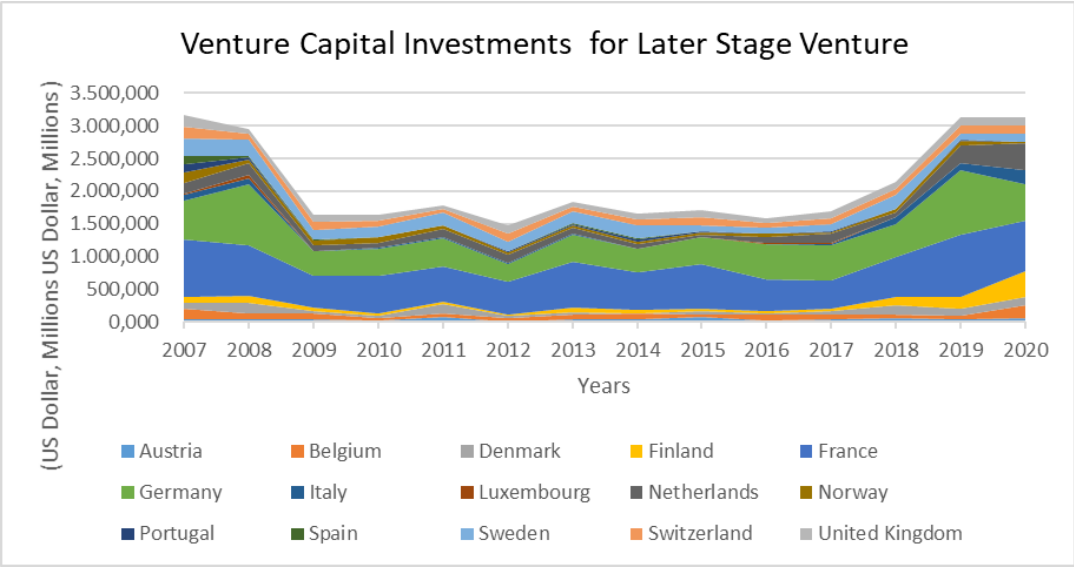
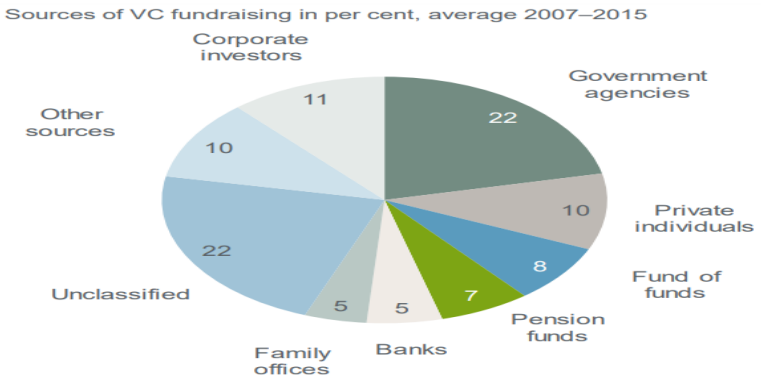


Figure 2 also reveals the venture capital investments made by European countries but for the later stage venture. Late-stage venture capital funding is for more established enterprises that may or may not be profitable now but have demonstrated growth and revenue generation. Like in the early stage, France and Germany have the highest number of VC investments. Finland follows them in the third order and seems to be more interested in making investments in later-stage ventures rather than start-ups and early-stage ones. Spain and Portugal have the lowest rates of investments to the later stage ventures. It is important to pay attention to Spain here because even if GDP is considered, this amount of investment remains very low. Compared to early-stage VCs it is clear that there is much less investment on late-stage VCs in European countries. According to Tech Nation Report, overseas money will account for more than 80% of later-stage VC investment in Europe's tech businesses in 2020 (Adler, 2021).

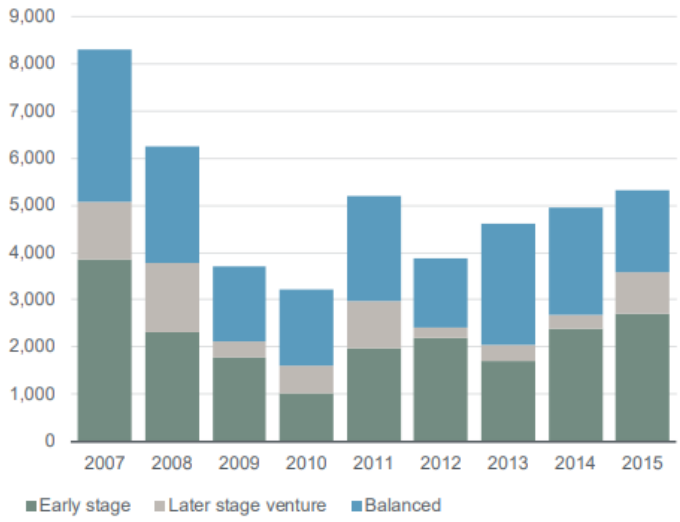
The European VC market is very fragmented, and we can see it from the previous paragraphs with the example of Austria, Germany, Portugal, Belgium, Italy, Spain, Denmark, Sweden, Finland, Netherlands, Switzerland, France, Norway, and the United Kingdom. The European average obscures the fact that VC markets in various European nations vary greatly in terms of stage of growth, size, and trends. They are very fragmented and diversified. This phenomenon comes because of differing country legal and regulatory regimes, as well as innovation systems.

Figure 3:



In European venture capital financing, government agencies play an essential role. They have provided more than a fifth of the capital committed to VC businesses in the EU since 2007. (Figure 1). No other VC investor offers such a large sum of money. Corporate investors and private people each give around 10%, which is about equal to what government agencies provide. Banks, insurance, and pension funds are among the other private investors who provide just a tiny fraction of the total capital. This demonstrates that one of the most significant difficulties facing the European VC sector is increasing private VC financing. In the United States, by contrast, governmental bodies play a modest role, while pension funds are the most important source of VC investment.

Figure 4:

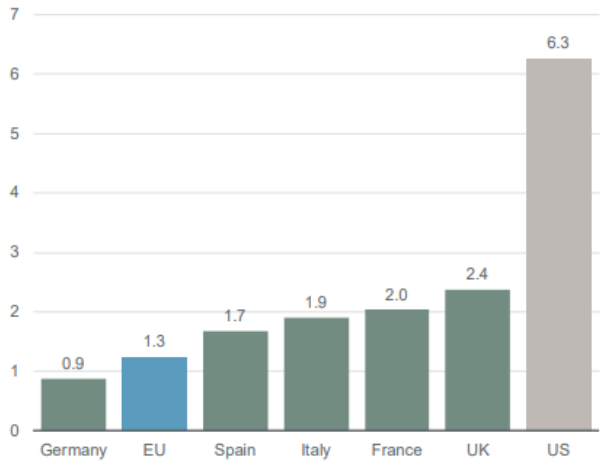


The majority of the EUR 40 billion raised since 2007 has gone to enterprises in the early stages of growth (i.e. seed or start-up stage, 46 percent). About a tenth of a Euro was set aside to invest in later-stage businesses (12%), while 42 percent of the funds had no defined target stage.

Since 2007, VC firms based in the EU have invested almost EUR 35 billion in over 28,000 startups. In both 2007 and 2008, annual investments totaled EUR 5–6 billion (Figure 2). When the financial crisis hit in 2009, VC investments plummeted to around EUR 3.5 billion per year, where they stayed until 2011. VC financing dropped to a short low of slightly more than EUR 3 billion in 2012 and 2013 but rapidly rebounded to 2011 levels by 2015. EU VC companies backed as much as 4,000 projects at the start of the period under consideration. Following then, the number of agreements declined to around 3,000 per year, where it remained until 2013. The number increased in 2014 but then plummeted to just 3,000 agreements in 2015.

Compared to the US, Europe is still lacking behind. The UK VC market is a substantial part of the EU VC industry, accounting for a quarter of all EU VC fundraising and investments, although it is still far behind the US sector (Figure 3). In the short and medium term, the outcome of the UK's vote on EU membership has created economic uncertainty. The long-term consequences of the choice to leave are uncertain at this time and will be influenced to some measure by the outcome of the "Brexit." It will be critical to keep a careful eye on how the venture capital industry responds to the changing economic conditions to guarantee that young, expanding businesses across Europe have access to the cash they require.

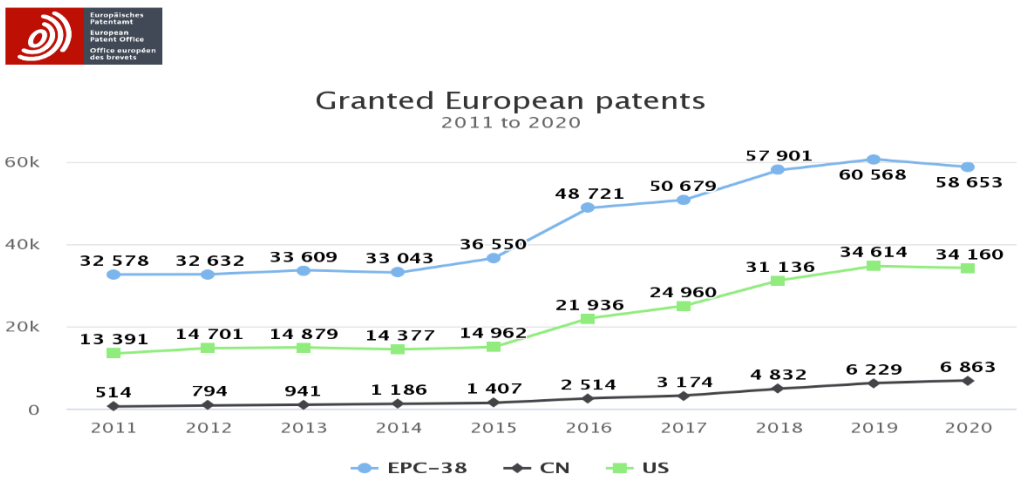
Figure 5:



European venture capital markets differ not just in terms of relative and absolute size, but also in terms of investment magnitude. Each fundraising round, VC firms invest an average of EUR 1.3 million in enterprises based in the EU. German enterprises receive the smallest amount of support among the nations evaluated, earning EUR 900,000 (Figure 3). Companies in Spain (EUR 1.7 million), Italy (EUR 1.9 million), France (EUR 2.0 million), and the United Kingdom (EUR 2.4 million) earn more money. In addition, the typical VC transaction size in the EU is far less than in the US, where VC-backed businesses earn an average of EUR 6.3 million each financing round. The larger capital market in the United States may explain part of the disparity. However, this phenomenon must do more with America's earlier and better legislation towards VSs which allow American firms' ability to push their business strategy, technology, and market penetration (i.e., market share) is far greater.

When we analyze patents granted from European Patent Office data, there is a strong relationship between EPO countries' numbers trend and the US. When we look distribution of wealth in the US, there exist strong deterioration and inequality conditions expanded in the US after the 1980s but there existed also the expansion of PE and VC activity. Those activities' effects on innovation policies, patents amounts could provide developmental opportunities for countries. Some government policies in Europe give us this relationship in data. In the literature part, Stander, P., (2017) give us change in government policies provide a sufficient environment for growing VCs. We know also from Pradhan, R. P et al. (2018), endogenous dynamics of economic growth and innovation with VCs are related to each other. Those facts give us to use change in the patent data of EPO countries and the US and their moving trend.

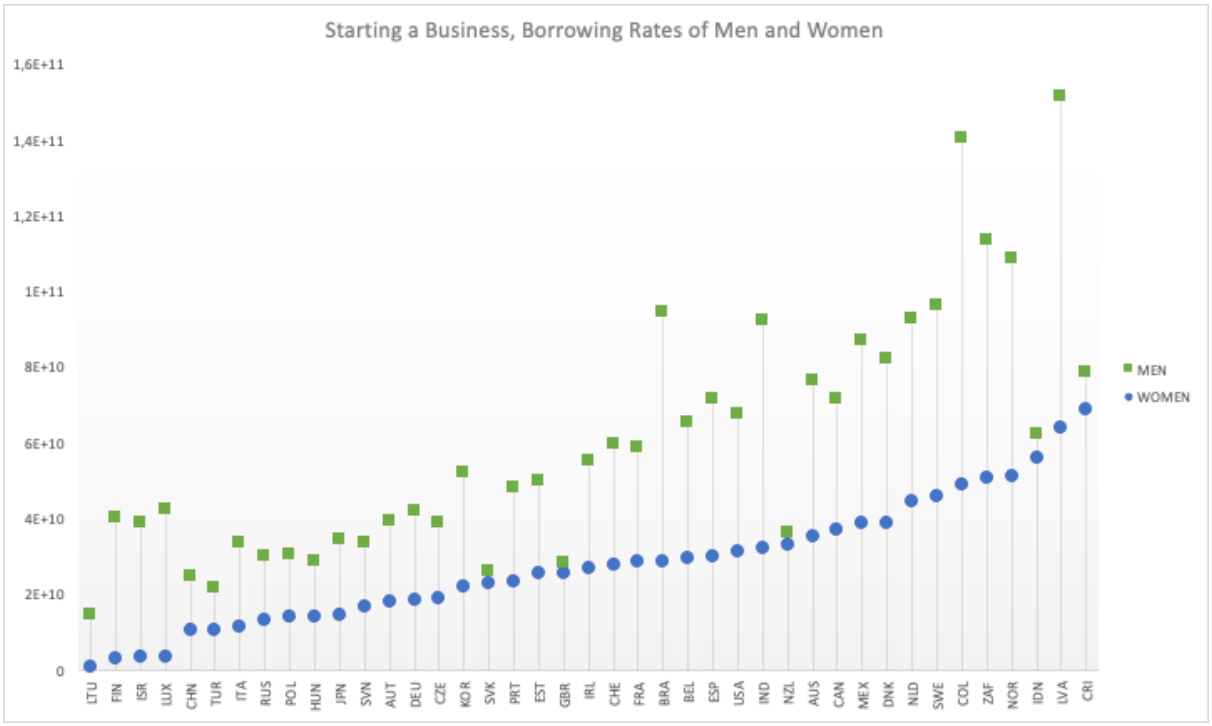
Figure 6:



Under OECD indicators, one of the effective indicators is the R&D expenditures ratio of GDP and there is some other new indirect indicator also, the ratio of woman inventors because when we analyze economic institutions, gender equality also counted as a developmental situation.

The below charts give us this ratio for inventors and starting a business from women and men. Our selected countries generally have a greater ratio of men's borrowing than women's; however, the difference between them is generally little or when compared to other countries, it is not so much important. As we mentioned in this paper, one of the development indicators is women's economic activities in life. This chart gives us to understand their borrowings for their enterprises.

Figure 7:

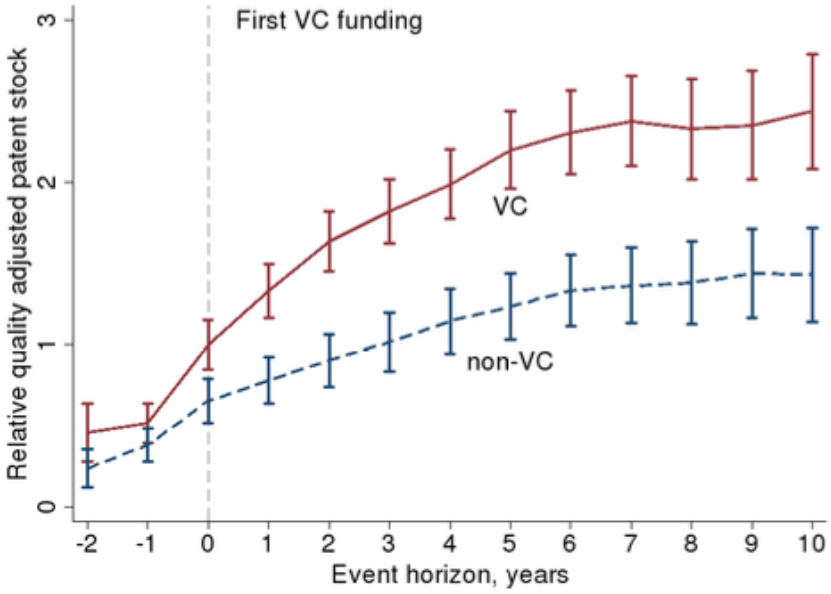


Detection of components of VCs and their developmental proof strongly depend on some structural breakpoints in the scope era. Components of economic growth include some points of R&D, innovation, and VCs' activities. Comparison of US and selected EU countries is important for R&D spendings and GDP ratio chart.

In the above figure, most of our selected countries are above the OECD average for R&D spending ratio in GDP. Some others increased their ratios and there are some exceptions.

Figure 8: Taken by Akcigit et. al

Figure 6 Evolution of average quality-adjusted patent stock before and after initial VC funding



Data from Akcigit et. al (2019) gives us the VC's effect on patent quality for innovative firms. Quantified data shows us the difference between VC and non-VC firms increasing in some years after funding and finally, the difference stays constant but it is obvious that this difference affects qualities of products and these products affect trade and economy on the macro scale because this data was not taken from one firm, in their research they used lots of firms and we can analyze this outcome in macro scale.

Discussion

This section will try to contextualize the results of the literature review, it will pose back to answer some questions that the reader might have when reading our findings based on desk research. The major findings as well as the meaning of those findings and how they relate to what others have done will be discussed in this part of the paper. No further research will be introduced, only suggestions for furthermore thorough research regarding the gaps that we have found while working on our research topic. As mentioned in the previous paragraphs, the challenge that Europe had to face the most was regarding the policies that were in place for venture capital investments. Its' growth was and is heavily dependent on the government's strategy and approach to VC investments. The prime example of this phenomenon is the government funding during the pandemic. Since the beginning of the COVID crisis,

government financing for innovation has increased. Early-stage enterprises that interface with private financial markets were the target of government funding schemes. Governments were able to reduce investment frictions, enhance capital allocation, and thereby boost local innovation by relying more on private capital markets. As mentioned in the literature review, when talking about the countries' institutional qualities and how they determine the 'rules of the game', we noticed that what these studies need is a comprehensive paradigm that classifies formal institutions according to their ability to be influenced or reformed. In this regard, not all formal institutions are the same. For example, governmental quality and political conditions are characteristics that cannot be directly influenced or modified (i.e., improved) in the near term. These formal institution traits frequently display significant path dependency dynamics and take decades to modify. They are structural in nature, but improving them would certainly benefit a much broader variety of economic activity than just venture capital.

Regarding the tax disparity between the EU and the USA, and how that tax disparity is one of the reasons why the EU is more behind in development on VC markets, our findings show that there are structural reforms that are being contemplated. To begin, there is a plan to propose lowering capital gains tax rates in order to boost after-tax returns on capital market investments. Second, by assuring equal tax treatment of equity and debt, the extremely high tax prejudice in favor of debt and against stock issuance will be eliminated. Third, it is planned to enact legislation to avoid double taxation of dividends from international investments. The last policy objective is tax reform to encourage entrepreneurship by lowering corporate tax rates and providing more favorable tax treatment for business formation and stock options as a form of remuneration for firm leaders. In this regard, one can notice that the EU is continuously undertaking approaches to ameliorate its VC market.

In recent years, Europe has attempted to close the gap with the United States in terms of venture capital activity, and a slew of new VC companies has popped up. The growth of the New Markets has played a significant part in this evolution, with a significant increase in the number of VC firms and VC-backed start-ups in the previous three years. Despite this, the disparity between the US and Europe in terms of venture capital generated and invested remains significant (Dehesa, 2002).

The European task moving ahead is not only to increase the yearly amount of venture capital investment but also to improve the quality of venture capital engagement. The "micro" elements of the venture capital process are just as crucial as the "macro" ones. The EU must foster a more entrepreneurial and professional venture capital business. This is undoubtedly a problem of

raising professional standards, but it will take time, as with any issue involving human capital development.

The US is the best example of the growth effect of VCs. It has crucial impacts on venture capitals because technology firms generally choose VC financing to follow exponential growth and obviously it is efficient for growth dynamics in the US. Pioneering high-tech startups also provide them with market power globally in some sectors. We have to mention the capital abundance of the US with respect to emerging markets.

Economic growth is one important determinant for the development of countries and in the historical perspective we cannot say directly when economic growth occurs, there exists economic development. In our research, there are some clues about these developmental opportunities for the public and all layers of society in selected countries. Patent numbers, increasing rate of enterprises, VC investments could contribute to solving some societal problems about inequality in gender, economic opportunities, and so on; however, while those events happen, if governments do not take any guiding policies about funding, patent processes, these improvements utilize only restricted layers in the society. What kind of tendencies exists in those enterprises? Do venture capital firms aim to enhance some social problems? Are there enough venture capital firms that seek social impact in enterprises? These questions and some institutions that provide UN's SDGs for funds and enterprises are important indicators for understanding the structure of VCs and investments quality for economic growth and development.

Conclusion

Venture capital firms and their way of business style is kind of new for capitalism, but it is important for sustaining it because in this era economies are growing up with new enterprises. Big firms and rapidly growing firms today, mostly financing from VC firms and these investments not only include monetary support but also include network and consulting supports. Generating new employment opportunities, solving the structural problems which cannot be solved from established firms' mainstream ways are the returns of those new enterprises. European conservative policies could cause the late awareness of this opportunity for competition in the world but there exist progressive policies in Europe. Rapid changes cannot happen in advanced European countries because of their well-established and complex policy structures. Analyzing policy implications, understanding the problem and the world's situation is important for implementing new policies. As we know in the financial structure of European countries, banking institutions are a strong part of the borrowing and this financing method cannot change rapidly.

Venture capital firms' effect on growth is much more visible after analyzing some key determinants of technological improvements. In this study, observing patent quality, startups' growth after funding, and the increasing rate of qualified patents after funding can show us the positive effect of VCs. Economic growth is not an effective indicator by self for understanding the improvements in the society. It is one crucial and indispensable determinant for progress. On the other hand, we should also look distribution of the wealth, growth components for the layers of the society. Could improvements on the startups provide society's goodness? Are these growth opportunities of startups sustained and inclusive? Under horizon that European countries have should ask those questions to amortize their late awareness because in developing countries there exist startup opportunities for VC firms.

References

Acevedo, M., F., et., al. (2016). Building Momentum in Venture Capital across Europe. France, Germany, Italy, Spain, and United Kingdom. https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Studien-und-Materialien/Building-Momentum-in-Venture-Capital-across-Europe.pdf

Adler, T. (2021, March 18). Europe suffers from lack of late-stage investors, says Balderton Capital. Growth Business. Retrieved December 26, 2021, from https://www.growthbusiness.co.uk/europe-suffers-from-lack-of-late-stage-investors-says-balderton-capital-2558933/

Bottazi, L., Da Rin, M. (2002), Venture capital in Europe and the financing of innovative companies: European Venture Capital. Economic Policy.

Calhoun, L. (2015, December 28). 10 growing trends in venture capital for 2016. Inc.com. Retrieved December 26, 2021, from https://www.inc.com/lisa-calhoun/10-big-venture-capital-trends-to-watch-in-2016.html

Constantin, C., & Olivier, D. (2001). Financing Innovative Firms Through Venture Capital. European Investment Bank, PJ/Industry and Services, EIB Sector Papers.

Cressy, R. 2006. "Venture Capital." In M. Casson, B. Yeung, A. Basu, N. Wadeson (eds.), The Oxford Handbook of Entrepreneurship. Oxford University Press, 353-386.

Da Rin, M., Nicodano, G., & Sembenelli, A. (2006). Public policy and the creation of active venture capital markets. Journal of Public Economics, 90(8-9), 1699-1723.

Davila, A., Foster, G., & Gupta, M. (2003). Venture capital financing and the growth of startup firms. Journal of business venturing, 18(6), 689-708.

Dehesa, G., (2002), Venture Capital in the United States and Europe: the US and European Experience with Venture Capital.

Dubocage, E., & Rivaud-Danset, D. (2002). The development of venture capital in Europe. The

role of Public Policy. Venture capital in Europe: international comparisons.

Dubocage, E., and D. Rivaud-Danset, 2002, "Government Policy on Venture Capital Support in France," Venture Capital, 4(1): 25-43.

Ederveen, S., Gorter, J., (2002). Does European Cohesion Policy Reduce Regional Disparities? CPB Discussion Paper.

EVCA (2002) Survey of the economic and social impact of venture capital in Europe. Res. Pap. from EVCA European Commission. (n.d.). Venture Capital. Internal Market, Industry, Entrepreneurship, and SMEs. Retrieved December 6, 2021, from https://ec.europa.eu/growth/access-finance-smes/policy-areas/venture-capital_en.

Gordon, M. (2007), Venture Capital and Government Policy: Ten Meditations on Venture Capital.

Grilli, L., & Murtinu, S. (2014). Government, venture capital, and the growth of European high-tech entrepreneurial firms. Research Policy, 43(9), 1523-1543.

Grilli, L., Mrkajic, B. & Latifi, G, (2018), Venture capital in Europe: social capital, formal institutions, and mediation effects. Small Bus Econ

Hasan, I., & Tucci, C. L. (2010). The innovation–economic growth nexus: Global evidence. Research Policy, 39(10), 1264-1276.

Horizon 2020. UKRI. (n.d.). Retrieved January 27, 2022, from https://www.ukri.org/councils/innovate-uk/guidance-for-applicants/guidance-for-specific-funds/horizon-2020/

Innovfin EU Finance for Innovators. EIB.org. (n.d.). Retrieved January 27, 2022, from https://www.eib.org/en/products/mandates-partnerships/innovfin/index.htm

Lerner, J., Moore, D. & Shepherd, S. (2005), A Study Of New Zealand's Venture Capital

Lerner, J., Leamon, A., Robles, G.A. (2021), Best Practices in Creating A Venture Capital Ecosystem.

Market and Implications For Public Policy: Report to the Ministry of Research Science and Technology, Auckland: LECG Limited.

Maensam. (2018, February 20). *Ventureeu - the European Union Venture Capital mega-fund*. Horizon 2020 - European Commission. Retrieved January 27, 2022, from https://ec.europa.eu/programmes/horizon2020/en/ventureeu

McGlue, D. (2002). The funding of venture capital in Europe: issues for public policy. Venture Capital: An International Journal of Entrepreneurial Finance, 4(1), 45-58.

Obrimah, O. A. (2016). Information production within the venture capital market: Implications for economic growth and development. Journal of Economics and Business, 87, 1-17.

Pradhan, R. P., Arvin, M. B., Nair, M., Bennett, S. E., & Bahmani, S. (2019). Short-term and long-term dynamics of venture capital and economic growth in a digital economy: A study of European countries. Technology in Society, 57, 125-134.

Pradhan, R. P., Arvin, M. B., Nair, M., Bennett, S. E., Bahmani, S., & Hall, J. H. (2018). Endogenous dynamics between innovation, financial markets, venture capital, and economic growth: Evidence from Europe. Journal of Multinational Financial Management, 45, 15-34.

Stander, P., (2017), Public Policies to Promoted Venture Capital: How to get National and EU Measures in Sync.

Oecd. (n.d.). Venture Capital Investments. Retrieved December 26, 2021, from https://stats.oecd.org/Index.aspx?DataSetCode=VC_INVEST