

Review of Literature on the Nexus of Innovation, Macroeconomic Conditions, Entrepreneurial Activity and Venture Capital Investments



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ABSTRACT

This article reviews the interconnection between innovation, macroeconomic environment, entrepreneurial activity and venture capital investments. Due to the interconnection of macroeconomic environment, entrepreneurial activity, innovation and venture capital with each other, by implementing venture capital investments as the base point, this article investigates the nexus in 3 key sections. The recent findings from researchers suggest that micro level determinants have the enormous impact on the venture capital investment activity such as ethics, protection of investors and transparency. The remaining policy implications will be denoted at the conclusion section of this article.

JEL Classifications: G24, O30.

Keywords: Venture Capital; Innovation; Entrepreneurial Activity; Macroeconomic Environment; Literature Review.

1. INTRODUCTION

History of venture capital is not more than half a century, but the scholars only tried to investigate them at the beginning of 1980's. Initially, this market started and evolved at the US while in such quick pace it has moved to other markets. Initially, scholars more focussed on the process of contracting such as origination (Manigart et al., 2006; Shane & Stuart, 2002; Sorenson & Stuart, 2001; Tyebjee & Bruno, 1984), screening (Croce, Martí, & Murtinu, 2013; Kaplan & Stromberg, 2001; Petty & Gruber, 2011; Tyebjee & Bruno, 1984; Walske & Zacharakis, 2009; Zacharakis, McMullen, & Shepherd, 2007; Zacharakis & Shepherd, 2001), due diligence (Busenitz, Fiet, & Moesel, 2005; Kaplan & Stromberg, 2001, 2004; Sorenson & Stuart, 2001; Walske & Zacharakis, 2009), and negotiation (Busenitz et al., 2005; Cumming, 2005; Kaplan & Stromberg, 2001, 2004; Sahlman, 1990; Shepherd & Zacharakis, 2001).

While for the last two decades the focus switched the overall determinants of venture capital investments. Early determinants have been investigated by the Gompers and Lerner (1998) at the US market but as time progressed scholars switched to longitudinal studies rather than country-specific results (Félix, Pires, & Gulamhussen, 2013; Groh & Wallmeroth, 2016; Jeng & Wells, 2000; Romain & Van Pottelsberghe de la Potterie, 2004). Involvement of venture capital also affects the economy in different ways such as Kortum and Lerner (2000, 2001) regarding innovation and the performance of the venture-backed firms after going public Gompers & Lerner (2001). Just according to the many scholars, it can be emphasized that venture capital first be nil the money blessed for innovation which definitely brings the causal relationship to each other and also the macroeconomic conditions, entrepreneurial performance indicators, and the technological opportunities.

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This study will first link venture capital and innovation (causal relationship) then it will try to investigate the effect of the macroeconomic environment, entrepreneurial activity indicators and the technological opportunities exist in the economies. The study will try to summarize previous literature and will provide some policy implications for the governments to attract more venture capital investments for the

This study is organized as follows: Section 2 reviews the causal link between venture capital and innovation; section 3 reviews the link between macroeconomic environment and venture capital investments; section 4 reviews entrepreneurial activity indicators and its link with venture capital; section 5 concludes the study.

2. CAUSAL LINK BETWEEN VENTURE CAPITAL AND INNOVATION

The global economy had its transition periods since innovation-led growth hypothesis promoted by seminal works of Romer (1986, 1990) and Lucas (1988). The change in the economic understanding that more innovative entrepreneurial activities lead to the growth of the venture capital industry on global context (Acs, 2006; Wennkers & Thurik, 1999; Wong, Ho, & Autio, 2005). The scholars investigated this relationship in dual concept and tried to identify if innovation positively exerts venture capital, or opposite scenario is valid. The studies conducted in this field also can be divided into firm-level, industry-level, and country-level studies.

2.1 Impact of Venture Capital on Innovations

Studies who tried to assess the impact of venture capital involvement on the innovation shows generally venture capital-backed firms likely to promote innovation levels throughout the economy. The US-based firm-level studies show that At the firm-level assessment Kortum & Lerner (2000) shows that manufacturing non-VC backed firms are likely to have an inferior performance at producing patents contrast to VC-backed counterparts at the state of Massachusetts, USA. Hellman and Puri (2000) at the Silicon Valley companies shows that VC-backed companies are likely to be more innovative and non-VC backed companies can be classified as the imitator of the VC backed companies. Chemmanur, Krishnan, & Debarshi (2011) investigates cross-industry level and finds that VC backed firms are more successful in implementing multifactor productivity growth.

While across the ocean at the European continent findings suggest that venture capital involvement likely to decrease the innovative progress after the venture capital backing is received. Such as Engel and Keilback (2007) investigated the early stage venture capital backing in Germany and they found out that post-backing leads to mitigation of innovative activity. Similarly, Caselli, Gatti, & Perrini (2009) investigated the Italian venture capital-backed IPOs, and their results are harmonious with Engel and Keilback (2007) findings where the innovative progress likely to diminish after guaranteeing the venture capital investment.

Industry-level studies nearly agree that innovative activity does not tend to decrease by the venture capital backing. Some of the early US-based studies (Gompers & Lerner, 2003; Kuchukova et al., 2016; Kortum & Lerner, 2000, 2001) mutually outlines that the venture capital backing increases patenting activity while they mutually agree that innovation cannot be just due to venture capital backing. Katila & Shane (2005) and Ueda & Hirukawa (2008) also shows that venture capital backing is essential for patent increases compared to other counterparts. Also, Ueda & Hirukawa (2008) also comments that increasing patenting activity might be related to the Internet boom of 2000's. While a more recent study by the Hirukawa & Ueda (2011) shows that compared to previous studies similar findings outlines that backing by venture capital is increasing the patenting activity while there is a conflict between findings of Chemmanur, Krishnan, & Debarshi (2011) where multifactor productivity growth during the period of 1968-2001.

Studies provided by Hirukawa & Ueda (2011), Kortum & Lerner (2000, 2001) and Ueda & Hirukawa, (2008) both report industry level and country level findings in their study. The findings on these studies are harmonious both industrial level and at the country level. Before Popov & Roosenboom (2012), there was a gap of cross-country studies, and they fill the gap quickly. By investigating aggregated VC investments across Europe, they find out that VC investments are only increasing patenting activity at high VC countries and along with this the ease of doing business in a country has strengthening effect on patenting activity. While Faria and Barbosa (2014) investigates 17 European countries and finding suggests that the overall VC investment activity positively

affects the patenting activity while early-stage investments do not affect the patenting activity while the later stage has the significant impact for the patenting activity.

2.2 Impact of Innovation on Venture Capital Investment Activity

As previously mentioned at the previous section it has been proven that venture capital backing and investments has a significant impact on the innovation led processes. This section investigates the innovation-related determinants affected the venture capital investments or not. The general approach in these studies focusses on the cross-country studies instead of the single country studies. One of the exceptions by Gompers and Lerner (1998) investigates the impact of R&D expenditure and the stock of knowledge. Strengthening impact of R&D expenditure and the stock of knowledge has been documented in this study. Romain & Van Pottelsberghe de la Potterie (2004) investigates 16 OECD countries the implemented findings are in line with the Gompers & Lerner (1998) where R&D and stock of knowledge. Additionally, Romain & Van Pottelsberghe de la Potterie (2004) uses the triadic patents, and they again find strengthening effect on venture capital activity. Investigating the 23 European states at a time horizon of 6 years Félix et al. (2013) finds similar findings concerning R&D expenditure with previous scholars (Gompers & Lerner, 1998; Romain & Van Pottelsberghe de la Potterie, 2004). Groh and Walmeroth (2016) made an investigation among 118 countries for 13 years and by using the composite innovation index and finds both for the developed and underdeveloped markets innovation is one of the critical drivers of the venture capital.

3. MACROECONOMIC CONDITIONS AS VENTURE CAPITAL DETERMINANTS

The seminal work of the Audretsch & Acs (1994) had the significant impact on the venture capital research and outlining macroeconomic environment has more impact on the new start-ups than other firms. The role of business and macroeconomic conditions on firms' performances and micro sectors have been rarely investigated in the literature (Sodeyfi & Katircioglu, 2016). Following this theory, researchers have employed macroeconomic conditions to determine venture capital activity. Gompers (1998) finds that GDP, GDP growth rate, short-term interest rate and magnitude of pension funds exerts positive impacts on the VC investments on the US market. Jeng & Wells (2000) finds out that that pension funds only affect the VC investments across time but regarding the between countries they could not be able to find any relationship. Romain & Van Pottelsberghe de la Potterie (2004) investigation on the venture capital investments throughout OECD countries shows harmonious results GDP growth and short-term interest rate with Gompers (1998) while they find that that long-term interest rates and interest rate spread have to strengthen and mitigating effect on VC investment activity respectively. Félix et al., (2013) investigation proves to be in line with previous studies in terms of GDP growth (Gompers & Lerner, 1998; Romain & Van Pottelsberghe de la Potterie, 2004) and long-term interest rate (Romain & Van Pottelsberghe de la Potterie, 2004) and they also find unemployment has negative impact on the VC activity. Groh and Wallmeroth (2016) also investigated macroeconomic variables they concluded that unemployment has significant diminishing effect where they are in line with Félix et al., (2013) also they find that exports are significant for the developed world while they could not find any relationship with the exports and VC investment activity.

4. ENTREPRENEURIAL ACTIVITY AND VENTURE CAPITAL

Entrepreneurial activity relates to the venture capital industry strictly. It should not be forgotten that these companies are not aged firms and likely to be affected by the existing or new entrants to the market. Audretsch & Acs (1994) shows that macroeconomic determinant has a significant effect on the entrepreneurial activity. This finding motivated scholars in the field to employ entrepreneurial indicators extensively in their research. Researchers generally divided entrepreneurial variables into two primary fields such as divestment versus investment-related activities.

For the divestments scholars employed initial public offerings (IPOs) (Félix et al., 2013; Gompers & Lerner, 1998; Jeng & Wells, 2000) and Mergers & Acquisitions (M&A's) (Félix et al., 2013; Groh & Wallmeroth, 2016). While the IPOs are not significant contributors for the US market (Gompers & Lerner, 1998) and early-stage venture capital investment activity (Jeng & Wells, 2000), Félix et al. (2013) show that IPOs are an essential driver for European Market. Félix et al. (2013) and Groh & Walmeroth (2016) mutually agree venture capitalists are likely to divest with M&A instead of IPOs. This result is also promoted with the positively exerted value of M&A on venture investment activity.

The existing entrepreneurial activity in the economy has been tested via taxation (Gompers & Lerner, 1998; Groh & Wallmeroth, 2016; Jeng & Wells, 2000; Romain & Van Pottelsberghe de la Potterie, 2004), labor market rigidities (Jeng & Wells, 2000; Romain & Van Pottelsberghe de la Potterie, 2004), stock market opportunities (Félix et al., 2013; Gompers & Lerner, 1998; Jeng & Wells, 2000), entrepreneurship intensity (Félix et al., 2013; Romain & Van Pottelsberghe de la Potterie, 2004) and the effect of legal rights, investor protection, IP protection, corruption (Groh & Wallmeroth, 2016).

Gompers & Lerner (1998) finds the disturbing effect of taxation investments at the US market and Romain & Van Pottelsberghe de la Potterie (2004) finds the same results while Groh & Wallmeroth (2016) partially in line with previous studies where they find negative association only for underdeveloped countries.

Jeng & Wells (2000) tested labor market rigidities by employing the skilled versus and unskilled labor force as the determinants, but they could only find a diminishing effect on the early-stage of venture capital investment activity. A harmonious finding by Romain & Van Pottelsberghe de la Potterie (2004) shows that labor market rigidities have a mitigating impact on the venture capital investments. By using employment protection index (EPI), they found out that that labor market rigidities will have the negative impact on venture capital investment along with the increased impact of GDP growth and R&D expenditure on the VC investments.

Stock market opportunities are also employed in the existing literature especially. Various determinants have been tested as the stock market opportunity determinants including equity market return (Gompers & Lerner, 1998), market capitalization growth (Félix et al., 2013; Jeng & Wells, 2000). The findings suggest the mixed impact on the VC investment activity. Gompers & Lerner (1998) finds strengthening the impact of equity market return on VC investment activity, the interim mitigating impact of the VC activity documented by Félix et al. (2013) which contradicts the findings of Jeng & Wells (2000) which they could not able to find any relationship.

Some researchers have also tested the level of entrepreneurial activity. Mutually using total entrepreneurial activity (TEA), Romain & Van Pottelsberghe de la Potterie (2004) and Félix et al. (2013) has tested how entrepreneurial activity impact on VC activity. While Romain & Van Pottelsberghe de la Potterie (2004) finds strengthening the impact of TEA along with the increased impact of R&D expenditure on VC investment. Contradictory to Romain & Van Pottelsberghe de la Potterie (2004) findings, Félix et al. (2013) finds that TEA has a negative impact on VC activity

Lastly, Groh & Wallmeroth (2016) has investigated the entrepreneurial activity via much more profound effects of the entrepreneurial activity via focusing public institutions and private. They argue that better legal environment, shareholder protection, transparency at private institutions and intellectual protection rights will promote the VC activity globally.

5. CONCLUSION

Four decades of research on VC investments bring shows that various researchers found different results. While the initial studies are intensively more focused on the macroeconomic conditions and innovations, more current studies focus on innovations and entrepreneurial activity. Mixed findings at the macroeconomic environment can be related with the cyclicalities of venture capital investments and crisis periods positively diversely impact VC investment activity (Black & Gilson, 1998; Jeng & Wells, 2000; Romain & Van Pottelsberghe de la Potterie, 2004). This hypothesis can also be applied in terms entrepreneurial activity where adverse entrepreneurial investments can limit activity in any economy, but search for innovative companies by the venture capitalists continued throughout 40 years of research.

These findings suggest that governments have to mutually pursue innovative-led growth and easing the barriers of doing business at the economy. In addition to this, complete advanced protection of investors, easing bureaucracy, eliminating corruption, transparency (both public and private) is equally essential for attracting VC investments to the economy. For last remarks, if the governments implement programs to promote the innovative capacity of the entry-level firms will create more supply of VC investments to the economy.

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