

Business Angel Activities across countries: An Institutional Perspective

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Business angels are crucial enablers of the development of an entrepreneurial ecosystem. Despite their importance, research straggled on this topic due to a scarcity of data on the precise total size of BA investments. This shortcoming poses a limit and makes it difficult to find the reasons behind the heterogeneity in BA activity across countries. This study suggests that the variation in BA activity can be attributed to diverging levels of the country's institutions and economic environment. Empirical analysis of BA activity data from EBAN reports for 20 European countries during the 2015-2019 period supports that there is a concurrent role of institutional quality, culture, and economic environment in BA heterogeneity across countries. The data further indicates that countries with sound institutions and an economic environment equipped with supply and demand generating forces are in a better position to get synergic benefits. Moreover, government R&D spending and BA specific incentives are favorable tools to promote BA activity. The results of this study have useful theory and policy implications for BA activity development.

Keywords: business angels; institutions; economic environment; culture; R&D spending

Introduction

In an economy, private equity (PE) plays a critical role in promoting entrepreneurial growth. Private equity originates from a variety of sources, including institutional and individual investors (Bonini, Capizzi, Valletta & Zocchi, 2018; Boulton, Shohfi, & Zhu, 2019). However, it has been seen during recent decades business angels remain one of the important sources of informal equity for seed and early-stage businesses, in contrast to institutional venture capitalists who perceive seed and early-stage investments as small and risky for investing (Harrison, Mason & Robson, 2010; Kraemer-Eis et al., 2018). To understand the term 'business angel,' we use the definition given by Mason and Harrison (2008). According to the authors, "a business angel is a high net worth individual, acting alone or in a formal or informal syndicate, who invests his or her own money directly in an unquoted business in which there is no family connection and who, after making the investment, generally takes an active involvement in the business, for example, as an advisor or member of the board of directors."

Being a major segment of the capital market industry, BAs are crucial enablers of the development of new firms and a significant contributor to job creation: in the US, approximately US\$23.1 billion has been invested in new businesses by business angels, leading to 251,200 new jobs, the number of active investors in 2018 rose to 334,565 from 288,380 (Sohl, 2019). According to the European EBAN report (2019), in the European Union (EU), approximately 804 million euros have been invested in the BA visible market, showing an increase of 9.97% from 2018. In addition, the invisible BA investment market is estimated to be worth 7,236 million euros, with a total number of business angels in both the visible and invisible markets of 345,000. The importance of business angels is further highlighted by developing countries where angel finance is new but it is rapidly spreading in the Asia-Pacific area, particularly in Malaysia, China, Vietnam, and the Philippines (Harrison, 2017; Lo, 2016).

The estimated figures depict well that BA markets are progressing, but at the same time, these figures give an indication that BA activity is not equally developed across countries

(Martin, Sunley & Turner, 2002; Landstrom & Mason, 2016; Prohorovs et al., 2019; Kelly, 2007). Although it is difficult to compare the BA activities of all countries due to the scarcity of data on the precise total size of BA investments (Cumming & Zhang, 2016; EBAN, 2019; Lerner et al., 2015). However, if European countries are compared on the basis of only visible BA market activity, heterogeneity prevails. In this regard, the United Kingdom's visible angel market is the most developed, with an estimation of 9,000 active angels who make about €109.40 million investment. The U.K is followed by France (5,000 angels), Spain (3,742 angels) and Germany (2,000 angels), while the Eastern European countries are still at a very early stage of development (Kraemer-Eis et al., 2018; Prohorovs et al., 2019). The factors responsible for the variation in business angel activity across European countries are not clear (Prohorovs & Fainglozs, 2019).

Variation in BA activity can be attributed to the diverging levels of economic activity in countries, which is often influenced by formal and informal institutional setups (North, 1990). Institutions and economic conditions influence activities such as innovation and entrepreneurship (Nelson & Nelson, 2002; Chowdhury & Audretsch, 2019; Bhat & Khan, 2014), which are important for BAs because they provide funds to entrepreneurial ideas that flourish innovation (Mason, Botelho & Zygmunt, 2017). Moreover, institutions and economic conditions also impact economic behaviours by facilitating new business formations and technological innovation (Acemoglu & Robinson, 2001). In addition, sometimes context affects proper resource allocations (Vijayaraghavan & Ward, 2001), which results in an uneven distribution of funds both within and between countries (Martin, 1999). However, keeping in mind the importance of institutions and the economic environment, previous studies mostly focused on the venture capital market and entrepreneurship in this respect (Li & Zahra, 2012; Fuentelsaz et al., 2018; Gantenbein, Kind & Volonté, 2019; Grilli, Mrkajic & Latifi, 2018; Aggarwal & Goodell, 2014). A limited number of studies on BA have accounted for such heterogeneity in cultural, institutional, and economic contexts (Tenca & Croce, 2018; Edelman et al., 2017; Cumming & Zhang, 2019). Furthermore, the available evidence on the impact of institutions and economic conditions altogether is limited. Prior studies on BAs have been undertaken prominently in Western Europe, the UK and very little in Central and Eastern Europe (CEE) (Zinecker, 2021; Prohorovs & Fainglozs, 2019).

The aim of this paper is to bridge the highlighted gaps in business angel literature on the basis of institutional theory. This study examines how the institutional quality, culture, and economic environment are creating heterogeneity in BA activity across European countries. Moreover, the current study also attempt to show that countries with supporting institutional and cultural arrangements, as well as a favourable economic environment, are in a better position to benefit from synergistic effects than countries lacking any of these supportive factors. Our analysis exploits the EBAN report's data on visible markets of BA activity in 20 countries during 2015-2019. This dataset enables us to provide empirical evidence on the concurrent role of institutional quality, culture, and economic environment in the heterogeneity of BA activity among closely held economies of Europe.

The remaining sections of this paper are as follows: In the following section, we review the literature and describe our theoretical framework. After that, we present the methodology, and empirical results. Finally, we conclude with a discussion that highlights the significance of our major findings and suggests future research directions.

Literature Review

Extant of early research on business angels includes descriptive and comparative studies on their personal characteristics (Aernoudt, 1999; Landstrom, 1993; Szerb et al., 2007; Ramadani, 2009; Li, Jiang, Long, Tang & Wu, 2014), their investment behaviours (Harrison and Mason,

2002; Boulton, Shohfi & Zhu, 2019; Sudek, 2006), and their motivations (Macht, 2007; Harrison & Mason, 2005; May & Liu, 2016). Recent studies counted for gender differences also (Burke et al., 2014; Boulton et al. 2019; Edelman, Donnelly, Manolova & Brush, 2018; Becker-Blease & Sohl, 2007; Poczter & Shapsis, 2018)

Later on, to better understand BAs and their investment activity, studies have considered some broader aspects such as institutions, economic factors, and government policies. Under this stream, Scheela et al. (2015) looked at the development of BAs in the economies of Thailand, the Philippines, and Vietnam in Southeast Asia. Using semi-structured face to face interviews, they reported, in general, a lack of institutional support: high political uncertainty, insufficient legal and financial support for investors and entrepreneurs, corruption, and inefficient government support for SME are all challenges for BA investment. Moreover, informal institutions play a great role for VCs and BAs investing in emerging economies to make up for formal institution deficiencies to some extent. Moving further, Ding et al. (2015) empirically confirmed the importance of informal institutions in their study of social trust and angel investment decisions. Using multilevel modelling on GEM data from 25 countries, researchers found that the level of trust and radius of trust are positively and significantly related to business angel investment decisions. In alignment with these studies, De Clercq et al. (2012), using GEM data, examined the impact of formal institutions (legal protection) and informal institutions (embeddedness in culture) on the micro-angel's investments in 26 countries during 2003-2007. According to the authors, micro-angel investments increase to the extent that countries have more protective legal systems and members are strongly embedded in interrelationships. In addition, negative interaction between legal protection and cultural embeddedness has also been reported due to the substitution role of formal and informal institutions. Recently, focusing on the contextual importance, Cumming & Zhang (2019) examined the impact of institutions on individual investors in comparison with PE/VCs. The authors used Pitchbook data from 1977 to 2012 to count differences in institutions and economic conditions across 96 countries. They found that, compared to PE/VC, angel investors prefer to invest in small entrepreneurial firms in wealthier countries with stronger stock market conditions, weaker regulatory environments, and a more individualistic culture. Even though angel-backed companies will have a lower probability of succeeding in their exits, better legal environments can help mitigate the negative effects, especially for IPO exits.

The same stream of literature also shows the importance of economic factors in the evolution of the BA market in different countries and provides mixed results. For example, in a Norwegian study, the lack of angel investment in tech start-ups has been attributed to macro environmental factors like Norwegian economic policies (Karhu, 2014), whereas Mason and Harrison (2002) reported only a modest effect of the economic environment on British business angels. On the contrary, a recent study conducted in the Czech Republic, using qualitative survey research, showed that macroeconomic development as measured by macroeconomic indicators is not a significant factor for the Czech BAs. Eventually, tax and monetary policy are not seen as substantial barriers to investment by BAs (Zinecker et al., 2021). Another relevant research, conducted in Sweden to see the variations in the BA market between two distant moments (1992 and 2004), by considering the macroeconomic environment to see time factor significance. The author concluded that favourable BA market development is the result of a more stable economic climate and a more favourable tax system in 2004 as compared to 1992 (Mansson and Landerstorm, 2006). Furthermore, some studies found that a higher GDP per capita rate in a country has a positive impact on the emergence of business angels, and BAs prefer to invest in wealthier countries (Burk et al., 2014; Cumming & Zhang, 2019). In contrast, Prohorovs & Fainglozs (2019) found that GDP per capita is not an influential factor in North European countries for visible BA activity.

From the above literature, it becomes obvious that institutions and the economic environment matter for BAs. However, it is also apparent from literature that studies have focused on limited aspects of formal institutions (legal, regulatory) and informal aspects (social trust, individualism, uncertainty) either individually or together. Similarly, studies related to the economic environment considered GDP, tax rates, interest rates, and inflation as major predictors, mostly in specific countries and provided mixed results. In addition, in spite of the fact that the usefulness of government schemes and tax incentives for BAs is contingent on the possibility of finding suitable investments (Mason, 2009), studies have yet to consider the factors that influence the availability of investment opportunities for BAs (Harrison et al., 2020; Wilson, 2015). To complement previous studies and to contribute to literature of angel financing, this study considers the overall influence of institutional quality (covering level of corruption, rule of law, government effectiveness, regulatory quality, political stability, and voice and accountability), diverse cultural values, and supply demand generating factors of economic environment.

After building the groundwork by reviewing the literature on BAs, we use institutional theory to construct hypotheses for our study.

Theory & Hypotheses Development

“Institution theory” believes that an individual’s and organizational activities are strongly shaped by institutions in a given environment (Powell & DiMaggio 1991). As a result, countries devise various institutions to develop the level of economic activity. North (1990), divides institutions into formal and informal. Formal institutions, for the most part, correspond to political, legal, and regulatory structures that support or impede economic activity within a country's borders by influencing legal aspects and policies. On the other hand, informal institutions come from socially transmitted information and are part of the heritage called “culture,” which alters an individual’s attitude and actions towards entrepreneurship, innovation, and risk-taking. It has been seen, both types of institutions are potentially important because of their interdependence (Peng et al., 2009) and, furthermore, some formal institutions change over time (e.g., political setups, rates of corruption, policies), whereas informal institutions do not. This distinct nature of institutions makes them more important to study. In the context of developed economies, the role of institutions is further crucial because such economies compete on the basis of innovation and discoveries, and their institutional setup can affect the speed of transformation of resources for these high productivity allocations (Balcerzak, 2020). By keeping in mind the relevance of the institutional landscape for economies, we further explain it in relation to business angel activities.

Institutional Quality and Business Angel Activities

According to Islam and Montenegro (2002), the quality of institutions represents a combination of factors from legal, political, geographic, economic, and social perspectives. These institutional factors significantly influence society’s well-being (Balcerzak, 2020) by driving finances, rule formation, contract enforcement, expropriation protection, property rights protection (La Porta et al., 1997), market information gathering costs (North, 1990), and channelling of resources to productive activities (Vijayaraghavan & Ward, 2001). All of these mentioned elements further have a direct bearing on the size and extent of the country’s capital markets (equity and debt) (La Porta et al., 1997), financial development (Law & Azman-Siani, 2012), FDI decisions (Hyun, 2006), VC activity (Li & Zahra, 2012) and BA markets (Scheela et al., 2015; Cumming & Zhang, 2019).

According to Kaufmaan et al. (2010), each country has a different composition of institutional quality (levels of corruption, government effectiveness, political stability, regulatory framework, rule of law, and voice and accountability). However, each factor of

institutional quality is equally critical for building a favourable ambiance for investors. For example, the rule of law in each country differs on issues such as expropriation and property rights protection. In this sense, common law countries protect both shareholders and creditors the most, while French civil law countries protect the least, with German civil law and Scandinavian civil law countries somewhere in the middle (La Porta, De Silanes, Shleifer & Vishny, 1997). This variation in the rule of law results in variant VC and BA investments (Nahata et al., 2014; Cumming & Zhang, 2019). Similarly, corruption, which interrupts financial exchanges, reduces government effectiveness, causes political instability, and distorts economic operations (Li & Zahra, 2012), is also a hurdle in the way of BAs (Scheel et al., 2015). Along with this, regulatory quality, which focuses on government policies and regulations for promoting private sector development (Baygan & Freudenberg, 2000), is significant for VC development (Bruton et al., 2005) and matters for BAs also. For this reason many governments are working hard to develop and implement policies (tax breaks, government VC funds, co-investment schemes, and guarantees) to encourage informal investment (Harrison et al., 2020). Furthermore, government efficacy within an institutional framework can have an impact on BA activity by influencing individual freedom, which determines the entrepreneurship potential and talent allocation across countries (Baumol, 1996). Finally, the citizen's voice and accountability power cannot be negated because they reflect the extent to which a country's citizens can choose and challenge its government. If the government has more power and creates a hostile atmosphere for investment by putting limits on inventions, innovation, or the establishment of specific enterprises, this can have an impact on a country's economic activity, which is crucial for BA activity.

To summarize, it can be argued that business angel activity benefits from a sound institutional setup. Because in a good quality institutional setup, rules are well defined, which leads to supportive infrastructure, increases trust, and induces enforcement of long-term contracts by reducing transaction costs and information asymmetry, which have been found critical for business angels by authors (North 1990; Ding et al., 2015; O'Gorman & Terjesen, 2006; Cumming et al., 2010). Poor quality institutions, on the other hand, reduce the motivation to invest, increase risk, hinder resource allocation, expropriate minority shareholders, and induce corruption, all of which were previously identified as barriers to business angel operations (Knowles & Weatherson, 2006, p.10; Scheela et al., 2015; Chiles & McMackin, 1996). Hence,

Hypothesis 1: Countries with a high quality institutional setup support business angel activities more than countries with lower institutional quality.

Culture and Business Angel Activities

According to institutional theory, the cognitive institution, which is most closely related to culture (Scott 1995), is extremely important and has a significant impact on investment decisions. Culture is described by Hofstede (2011) as "the collective programming of the mind that distinguishes the members of one group or category of people from members of other groups or categories of people." One country's national culture is not the same as another's. As a result, it is being observed that the same institutions have different outcomes in different societies (North, 1990). In this regard, Lerner et al. (2018) show concern that angels only waste their resources in countries having an unsupportive culture for start-up investments. Whereas Romaní and Atienza (2016) also identified culture as an obstacle to the growth of the Latin American angel industry. A recent study by Cumming & Zhang (2019) further elaborated on the cultural importance and found that angel investments are strongly tied to cultural factors, and they are most prevalent in countries that favour individualism and risk taking. Furthermore, Sorheim & Botelho (2016) suggest that considering culture is key to studying BA market heterogeneity. In line with previous suggestions, this study focuses on Hofstede's diverse

cultural dimensions (power distance, individualism, uncertainty avoidance, masculinity, and long-term orientation) to explain the heterogeneity in business angel activities across countries.

Power distance (PDI)

Power distance expresses “the extent to which society’s less powerful individuals tolerate and expect unequal power distribution.” People in societies with a high level of power distance accept a hierarchical system that needs no further justification (Hofstede, 2011). Furthermore, high power distance societies signal a lower level of political stability (Hofstede, 2011), a lower desire to initiate innovative ventures and approach to people with power and financial resources (Sarajurri, 2018). In addition, agency problems and expropriation of minority shareholders are more likely to dominate in such societies (Demirgüç-Kunt & Maksimovic, 1998), which decreases the emergence of informal investors (Szerb et al., 2007)

By keeping in mind the literature, we argue that a country’s level of power distance may create BA heterogeneity. Business angel investors are fund providers for start-ups and keen to promote entrepreneurship, which is missing in high power-distance society. This may create a hurdle for BAs trying to locate good opportunities in such a setting. Furthermore, BAs are minority stakeholders in start-ups and are mostly interested in participating in the venture management and seeking long-term relationships, which is difficult in high-power distance societies due to the risk of minority expropriation. The element of seniority is prevalent in high power distance societies, which can further hinder the interaction among entrepreneurs, people with start-up ideas, and angel investors, which can stifle angel investment growth. Therefore,

Hypothesis 2 (a): The higher the level of power distance, the lower the angel activity will be in the country.

Individualism (IDV)

Individualism is a “desire for a loosely-knit social structure in which people are expected to take care of themselves and their immediate families” (Hofstede, 1980). Individualism emphasizes personal freedom, achievement, and entrepreneurial attitudes as it is closely related to pro-market attitudes, risk-taking, entrepreneurship, and innovation (Li et al. 2013; Taylor & Wilson 2012). Individualist culture therefore awards social status to personal accomplishments such as important discoveries, innovations, or great artistic achievements. Furthermore, individualism is associated with a wide circle of trust, which enhances investment in a stranger’s new venture (Ding, Au, & Chiang, 2015). However, angel investors make investments in ventures with which they have no family ties, which involves high risk. In addition, take decisions individually on the basis of trust and the entrepreneur’s skills. So, it is more likely that individualist societies are at some advantage in creating BA activity. Hence,

Hypothesis 2 (b): A higher level of individualism will lead to a higher level of business angel activity in the country.

Masculinity (MAS)

As defined by Hofstede, “masculinity and femininity refer to the way a culture values masculine or feminine traits in business and members of a society either seek achievement, heroism, assertiveness, wealth, and material rewards for success or prefer cooperation, modesty, social care, and quality of life (Hofstede, 2011). Previous research reveals that countries with a masculine culture are less likely to pursue socially responsible investments (Scholtens & Sievanen, 2013), and foreign direct investment (Kayalvizhi & Thenmozhi, 2018). On the other hand, masculinity has been found to be positively related to externally financed growth, risk-taking, productivity, and associated with more innovation (Li et al., 2013; Mihet, 2013). As angel investing entails a significant level of risk, it may be more prevalent in masculine societies. In addition, highly masculine countries put a great emphasis on material

success and economic growth (Andrijauskiene & Dumčiuvienė, 2017), which are associated with entrepreneurship (Meyer & Jongh, 2018), for which business angels are major fund providers. On the basis of previous studies' findings, it can be proposed:

Hypothesis 2 (c): The greater the level of masculinity in a country, the greater the level of business angel activity.

Uncertainty avoidance index (UAI)

Uncertainty avoidance refers to “the extent to which the members of a culture feel uncomfortable and threatened by uncertainty and ambiguity.” (Hofstede, 2011). Higher uncertainty avoidance cultures prefer security, show greater fear of failure, career paths are typically defined, and conflict or the unknown is avoided if necessary (Hofstede, 1980). Eventually, uncertainty avoidance societies discourage risk-taking, innovate less, provide less access to a variety of financial options, tend to associate with the banking system and avoid investing in non-family businesses (Li & Zahra, 2012; Aggarwal & Goodell, 2014; Mihet, 2013; Kwok & Tadesse, 2006; Perry, Chand & Ring, 2015). Many studies have also found a significant negative correlation between uncertainty avoidance and entrepreneurial development (McGrath et al., 1992; Mueller & Thomas, 2001). According to Cumming and Zhang (2019), angel investors are also more sensitive to the cultural dimension of uncertainty avoidance. Building on previous literature, it can be expected that high uncertainty avoidance can impact business angel activity by influencing risk-taking behaviours, innovation, and entrepreneurial development.

Hypothesis 2 (d): A higher level of uncertainty avoidance will result in lower business angel activity in the country.

Long Term Orientation (LTO)

The long-term/short-term dimension reflects the connection of past, current, and future actions and challenges within a society. (Hofstede Insights, 2018). Future orientation refers to the degree to which individuals engage in future-oriented behaviour. Starting a new venture is a proactive form of such behaviour (Bird, 1988), and the same can be applied to investing in a new venture (supply side view). In addition, societies having a long-term orientation prefer savings and accumulation of funds that are readily available for investment as opposed to their counterparts, which prefer social spending and consumption (Hofstede, 2011). So, based on previous findings, it can be deduced that business angel activity might be more pronounced in countries having an LTO dimension because such societies have a good amount of savings that can be used to make investments. Therefore,

Hypothesis 2 (e): Countries having a long-term orientation will be more inclined towards business angel activities.

Economic Environment and Business Angel Activities

Apart from formal and informal institutional setups, it has been given that favourable external economic conditions are also important to business angels' propensity to invest (Harrison, 2017; Zinecker, 2021). In addition, it has been seen in the past that economic policies have proven to be an effective instrument for encouraging young, innovative enterprises and have facilitated the development of the business angel market in OECD countries (Wilson, 2015; OECD, 2011). In contrast, a study which was conducted to compare the economic and legal factors of VC investment, fundraising, and exists across 15 countries found that the introduction of substantial publically funded programs is not associated with an increase in VC investment, and can even result in a fall in overall VC investment in some circumstances (Cumming et al., 2010). To better understand the role of economic factors in the development of BA activity, we check for demand and supply generating factors together.

Role of personal income taxes

A few past studies based on surveys have focused on the role of taxes in the case of business angels, and it was found that among major macroeconomic factors (growth in GDP, interest rate, inflation, and tax rate), tax policies most significantly affected business angels' investment in developed countries (Edelman et al., 2017; Mansson & Landstrom, 2007). In another survey study, conducted on business angels affiliated with the National Business Angel Network, comprising respondents from multiple regions (e.g. London, South East, Ireland, Scotland, and South West), also found that business angels are willing to invest in unquoted companies due to different tax incentives. According to this survey results, reducing capital gains tax would encourage 52% of investors to invest more in unquoted companies, while reducing dividend tax would encourage 43% of investors. A total of 74% of business angels would be encouraged to invest more by front-end tax relief (Masson & Harrison, 2002). A recent study following Monte Carlo simulation methods and data from 86 angel investing groups in North America reaffirmed the role of taxes in driving the flow of angel investment. (Harrison et al., 2020). Similarly, while researching the impact of government intervention and policies on the promotion of angel activities, Li, Shi, Wu, Wu, and Zheng (2016) found that economic policies, such as tax reductions, are also positively significantly related to Chinese's business angel investment. On contrary, Carpentier and Suret (2016) suggest that there is limited evidence to confirm a positive outcome with taxes for BAs, because they are not tax-driven investors (Jose et al., 2005).

Adding to the debate on taxes using empirical means, this study argues that personal income taxes can affect the supply of angel funding. It has been seen in the past that the propensity to become an informal investor depends upon personal income tax (Szerb et al., 2007). This finding makes it logical to think that if personal income taxes can impact the number of BAs, they surely can influence the amount of savings these angel investors hold for making the investments. Additionally, personal income taxes can influence BA activity by affecting the level of demand for angel money. Because low capital gains tax rates, income tax rates, and corporate taxes all influence whether or not a person starts a business, exits an existing one, or becomes an entrepreneur, as well as the level of entrepreneurial activity (Gompers & Lerner, 1999; Bruce et al., 2005; Poterba, 1989). By summarizing and to get clarity about the role of taxes in the case of business angel activities, we propose that,

Hypothesis 3 (a): Low tax rates are favourable for business angel activity.

BA Specific Incentives

Apart from general tax policies, governments specifically target business angel activities with dedicated tax incentives (Harrison et al., 2020). Prominent examples of such initiatives are the Early Stage Investors (ESI) program, Seed Enterprise Investment Scheme (SEIS) and the Tante Agaath (Aunt Agatha) scheme, which provides tax incentives, particularly to angel investors. In many countries, governmental guarantees have recently been included as a specific mechanism for developing angel funding for start-ups. In case of guarantees, the complete loss, or a percentage of the overall loss, is reimbursed to the business angel by the public authorities in the public guarantee. Another similar tool that has been used by the government to intervene directly in informal markets is co-investment schemes. A co-investment fund is defined as "an investment mechanism that results mainly from a public-private partnership between the state/government and business angels for investments in early stage start-ups" (EBAN, 2016, p. 9). EBAN reported over 150 co-investment and related funds in 23 European countries. 84% of BAs in Europe are co-funded by the public sector (EBAN, 2002; Mason, 2009). Such co-investment schemes are also common outside the European region, such as in China, where the

Chinese government co-invested with local venture capitalists to help them expand (Pukthuanthong & Walker, 2007).

All of these schemes are important for business angels in diversifying the risk and cost sharing. In the absence of such schemes, most business angels are forced to support the same initiative again after the initial round of investment. As a result, investment is concentrated on a single project, risk spreads are narrowed, and business angels face significant losses if the venture fails.

Although these schemes are taken as policy measures by many countries to increase the supply of angel funds (Wilson, 2015). All countries still do not offer an equal quantity and quality of BA schemes (Ali et al., 2017), which can be the potential cause of heterogeneity in BA activity across countries. So we propose the following:

Hypothesis 3 (b): Countries with BA-specific incentives have higher levels of business angel activity.

Role of government R&D spending

It is a general belief among authors in literature that it is worth considering shifting the focus from the increasing supply to creating a demand for angel funds (Harrison, Bock & Gregson, 2020). Due to recent tax incentives, business angels are willing to invest in unquoted companies, but good opportunities are missing (Masson & Harrison, 2002). Following on these studies, we check for government efforts to create demand for BA funds by focusing on government R&D spending.

Government investment in research and development (R&D) is critical for the creation of information, products, and technologies that are necessary for supporting entrepreneurship, economic growth, and innovation (Islam, 2015; Marcelino-Jesus et al. 2017, Freimane & Bāliņa 2016). Despite this, government spending on R&D fluctuates across countries and tends to change over time. Some countries, like France, the Netherlands, and Spain, offer fiscal incentives for private investment and R & D expenditures, whereas Finland seems less prone to providing such incentives (Bedu, Nicolas & Montalban, 2014). Moreover, in this regard, some previous studies found a significant positive relationship between public R&D and VC, R&D tax breaks and low public R&D expenditures of countries, the private sector's R&D decisions and the availability of government R&D support (Bedu, Nicolas, and Montalban 2014; Da Rin et al., 2006; Castellacci & Lie, 2015; Guellec & Potterie, 2003). Contrary, Silaghi et al. (2014) reported a statistically insignificant role of public R&D spending in the growth of Central and Eastern European countries.

Business angels are keen to find new investment opportunities and make investments in innovative, technology-oriented, and growth-oriented seed enterprises (Mason, Botelho & Zygmunt, 2017; Aernoudt, 2005). As declared in the report, 62% of angel funds are invested in seed and 36% are invested in pre-seed in 2018, whereas Fin-tech and software enterprises took the lead with 16% and 15% of total BA investment in 2018 (EBAN, 2018). Government R&D spending can provide a better ground of investment opportunities for BAs by facilitating new discoveries and innovative ideas. Moreover, economies with heavy government R&D spending may have a conducive environment for business angels by creating business incubators and research parks that all foster start-up creation (Keuschnigg & Nielsen, 2004; Phan et al., 2005). Hence,

Hypothesis 3 (c): Business angel activity is more developed in countries with higher government R & D spending.

Methodology

We test our hypotheses using data from the EBAN Statistics Compendium on visible business angel activity, which includes the number of BAs and BA investment amount. Although data

collected through BANs has several limitations, but BANs are still a good source of information to see the trends in BA investments (Prohorovs et al., 2019; Mason, 2006). In this regard, the EBAN Statistics Compendium is one of the most comprehensive annual report on the activity of business angels in Europe. It compiles data from different EBANs, the Federation of BANs, individual business angels and data published in 35 other sources, amongst which include: Dealroom, Crunchbase, PitchBook, the European Commission, National Venture Capital Associations, and national and regional research studies on angel investment (EBAN, 2019). Data on business angel activities enables us to examine how variations in institutional quality, the economic environment, and culture help to explain the heterogeneity in BA activity across countries. We focus on the period 2015-2019 to see the latest trends in BA activities across 20 countries.

Table 1 provides information on the main variables in our dataset. Our main dependent variable is total BA activity, which is the product of the number of business angels in a country and the amount invested by business angels in that country during 2015-2019. Explanatory variables include the World Governance Index (WGI) to measure each country’s institutional quality, Hofstede’s dimensions (power distance, individualism, masculinity, uncertainty-avoidance, and long-term orientation) to measure cultural conditions, personal income tax rate, BA specific incentives (tax grants, public co-investment schemes and guarantees), government R&D spending to measure economic environment of a country, as well as control variables such as cost of business procedures, domestic credit availability, and GDP per capita.

Table 1. Data description

Variables	Description	Source
Business Angel Activity	It is product of number of BA and amount invested by individual BAs during years 2015-2019	EBAN Statistics Compendium(2015-2019)
Institutional Quality:	World governance index carrying 6 dimensions (voice & accountability, political stability & lack of violence, government effectiveness, regulatory quality, rule of law and control of corruption) have been utilized to quantify institutional quality.	World Governance Indicator (WGI) given by Kaufmann et.al, 2009 World Bank ¹
i) Government Effectiveness	“It measures perceptions of the quality of public services, civil service and its independence from political pressure, quality of policy formation and implementation.”	WGI
ii) Political Stability	“It measures perceptions of the likelihood of political instability.”	WGI
iii) Regulatory Quality	“It reflects perceptions of the ability of the government to formulate & implement the	WGI

¹ <https://info.worldbank.org/governance/wgi/>

<p>iv) Rule of Law</p> <p>v) Control of Corruption</p> <p>vi) Voice & accountability</p>	<p>sound policies and regulation that permit and promote private sector development.”</p> <p>“It reflects perceptions of the extent to which agents have confidence and abide by the rules of society, particular the quality of contract enforcement, property rights, the police and the courts.”</p> <p>“Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.”</p> <p>Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.</p>	<p>WGI</p> <p>WGI</p> <p>WGI</p>
<p>Culture:</p> <p>i) Individualism (IDV)</p> <p>ii) Uncertainty Avoidance (UAI)</p> <p>iii) Power Distance (PDI)</p> <p>iv) Masculinity (MAS)</p>	<p>“Culture the collective mental programming of the human mind which distinguishes one group of people from another.” Cultural dimensions given by Hofstede as a result of global survey conducted to IBM employees around the world.</p> <p>Individualism focuses on the relation between the individuals. Individualistic societies involve loosely knit social relationships, emphasize self-reliance and independent action, and embrace personal challenge and individual freedom.</p> <p>The Uncertainty Avoidance Index (UAI) reflects a society’s level of anxiety regarding the unknown and the unfamiliar.</p> <p>The Power Distance Index (PDI) focuses on each society’s solution to problems resulting from social inequality and reflects the extent to which the less powerful members of a society accept the legitimacy of an unequal distribution of authority.</p> <p>The Masculinity/Femininity dimension represents a society’s perspective regarding the social implications of gender. Members of a more Masculine (MAS) society are more</p>	<p>http://geerthofstede.com/national-culture.html.</p> <p>Hofstede (2011)</p> <p>Hofstede (2011)</p> <p>Hofstede (2011)</p> <p>Hofstede (2011)</p>

v) Long-term orientation (LTO)	<p>assertive and independent and attach greater value to achievement and material success.</p> <p>The long-term – short-term dimension reflects the connection of past, current and future actions and challenges within a society.</p>	Hofstede (2011)
<p>Economic Environment:</p> <p>i) Personal income tax</p> <p>ii) Government R&D spending</p> <p>iii) BA specific incentives</p>	<p>Tax on personal income is defined as the taxes levied on the net income (gross income minus allowable tax reliefs) and capital gains of individuals.</p> <p>Public budget allocation for research & development activities</p> <p>Incentives (special tax incentives, loan-guarantees, public co-investment schemes)for business angels</p>	<p>OECD, EBAN Compendium of fiscal incentives (2018)</p> <p>Eurostat</p> <p>EBAN Compendium of fiscal incentives (2018)</p>
<p>Control Variables:</p> <p>Domestic Credit (% of GDP)</p> <p>Cost of Business procedures (% of gross GNI per capita)</p> <p>GDP per capita</p>	<p>Financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment.</p> <p>It represents the cost required for business start-up procedures</p> <p>GDP (gross domestic product) is an indicator for a nation’s economic situation. It reflects the total value of all goods and services produced less the value of goods and services used for intermediate consumption in their production. GDP per head basis allows for the comparison of economies significantly different in absolute size. Data are in current price (Euros)</p>	<p>World Bank</p> <p>World Bank</p> <p>EuroStat</p>

Table 2 displays the summary statistics for our measures. It represents the original as well as the natural logged values of the number of BAs, the amount invested by BAs, and total BA activity (No. of BA * amount invested). The dimensions of the World Governance Index (WGI), which are taken as measures of institutional quality, are highly correlated (the correlation ranges between 0.65 and 0.97), so we have used principal component analysis to develop the composite index. The Appendix reports the Eigenvalues for the PCA conducted, showing the first principle component has a variance of 5.07, explaining 84.6% of the total variance. The first component is used to calculate the composite index. Cultural variables are taken at their original scale of 0-100.

Table 2. Summary Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Total BA activity	100	7.947	2.107	9800000	1.378
LN of total BA activity	100	22.669	2.568	16.098	27.951
Number of BAs	100	1233.11	1953.395	24	9000
LN of number of BAs	100	6.154	1.443	3.178	9.105
Amount invested by BAs	100	26503300	2.84	350000	1.531
LN of amount invested by BAs	100	16.516	1.203	12.766	18.846
Power Distance Index (PDI)	100	44.9	18.453	11	73
Individualism (IDV)	100	60.55	17.76	27	89
Masculinity (MAS)	100	40.3	23.915	05	79
Uncertainty Avoidance	100	64.6	21.836	23	99
Long Term Orientation	100	54.25	16.976	24	83
Government R&D spending	100	4.838	6.760	46600000	3.387
Personal income tax rate	100	10.291	5.712	4.662	30
BA specific incentives	100	0.65	0.479	0	1
Institutional Quality	100	0.00	2.253	-5.063	2.984
Domestic Credit Availability	100	92.707	39.115	34.37	169.97
Cost of Business Procedures	100	3.207	3.895	0	14.4
GDP per capita	100	34909.1	19014.701	6380	76400

This table presents summary statistics of dependent, independent and control variables

In Table 3, we present a pair-wise correlation matrix for each of our variables. We used orthogonalized values of cultural dimensions and institutional quality due to the issue of multicollinearity, using a modified Gram-Schmidt procedure that “partials out” the common variance and creates transformed variables that are uncorrelated with one another (e.g., Sine et al., 2006). Our correlation highlights that there is a minor issue of collinearity across a control variable (GDP per capita) and some other variables (institutional quality and domestic credit availability). To avoid spurious results, we included GDP per capita only in a selective model for empirical analysis.

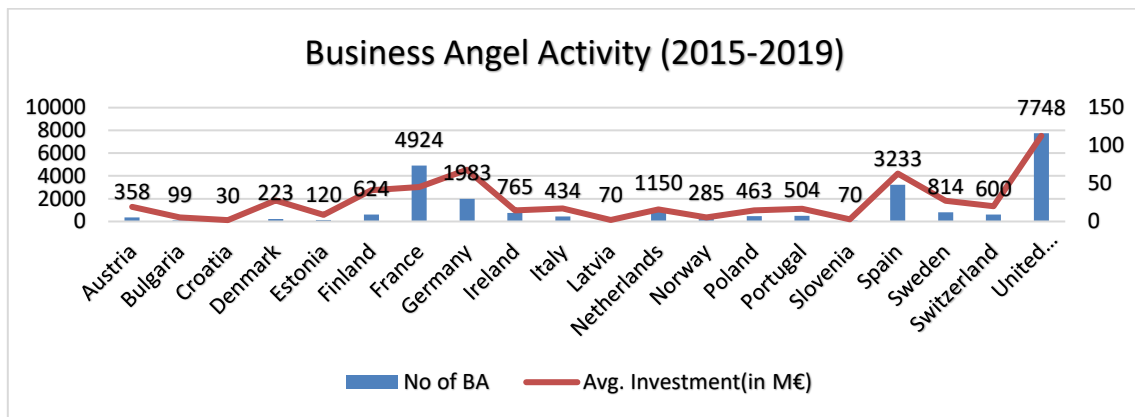
Table 3. Pair-wise correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Logged BA Activity	1.00														
(2) Logged number of BAs	0.98*	1.00													
(3) Logged amount invested by BAs	0.96*	0.88*	1.00												
(4) Institutional Quality+	0.42*	0.37*	0.44*	1.00											
(5) Power Distance PDI+	0.06	0.13	-0.03	0.00	1.00										
(6) Individualism IDV+	0.43*	0.50*	0.32*	0.00	0.00	1.00									
(7) Masculinity MAS+	0.42*	0.41*	0.41*	0.00	0.00	0.00	1.00								
(8) Uncertainty Avoidance UAI+	0.09	0.11	0.07	0.00	0.00	0.00	0.00	1.00							
(9) Long-term Orientation LTO+	-0.12	-0.13	-0.10	0.00	0.00	0.00	0.00	0.00	1.00						
(10) Government R&D spending	0.63*	0.63*	0.59*	0.18	0.06	0.41*	0.38*	0.10	0.29*	1.00					
(11) Personal income tax rate	-0.22*	-0.29*	-0.12	-0.004	-0.16	-0.11	-0.20*	-0.42*	-0.02	-0.04	1.00				
(12) BA Specific Incentives	0.25*	0.28*	0.19	-0.28*	0.09	-0.13	0.38*	0.02	-0.07	0.26*	-0.01	1.00			
(13) Domestic Credit availability	0.46*	0.42*	0.47*	0.66*	0.08	0.12	-0.02	-0.06	-0.03	0.21*	0.25*	-0.32*	1.00		
(14) Cost of business procedures	0.007	0.01	0.00	-0.42*	-0.17	0.28*	0.36*	0.35*	-0.06	0.19	0.01	0.10	-0.25*	1.00	
(15) GDP per capita	0.37*	0.36*	0.35*	0.82*	-0.10	0.09	0.19	-0.16	-0.08	0.19*	0.06	-0.22*	0.66*	-0.28*	1.00

This table provides correlations across the main variables in dataset. Significant to at least the 5% level of significance
 Variables with + are orthogonalized

Figure 1 graphically depicts the number of business angels and total investment from 2015 to 2019 in order to provide a detailed overview of business angel activity variations across 20 European countries. It is clear from the graph that BA activities show variation across countries. For example, BA activity is notably high in countries such as the UK, Germany, Spain, and France. On the other hand, Croatia, Bulgaria, Latvia, and Slovenia represent the least business activity during the selected period. Another noteworthy point is the distribution of business activity within the country. For example, in the UK, the number of BAs and amount invested are aligned, but in other countries, like France, there are more BAs but less investments in comparison with Germany, which has a lower number of BAs but a greater amount invested. These variations within a country are an indication that country-specific factors (e.g., varied institutional setups, culture, economic conditions) impact the emergence of BA (Szerb et al., 2007) and their decision to make the investment (Cumming & Zhang 2019).

Figure 1. Business Angel Activity across countries



Moreover, in Figure 2, a clustering of countries can be seen according to their respective cultural values, institutional quality, and investment activity. If we see the prominent countries (UK, Germany, Spain, France), which are closely held on particular dimensions (e.g., individualism), they show deviant levels of investment. The first reason for this deviant behaviour in BA activity across countries can be due to their cultural values differences on the rest of cultural dimensions (MAS, UAI, LTO, PD), and the second reason for such deviation across countries is given an indication of differences in other influencing forces such as institutional quality, which is also highlighted in the last graph below.

Figure 2. Average BA Activity, cultural values and institutional quality (2015-2019)

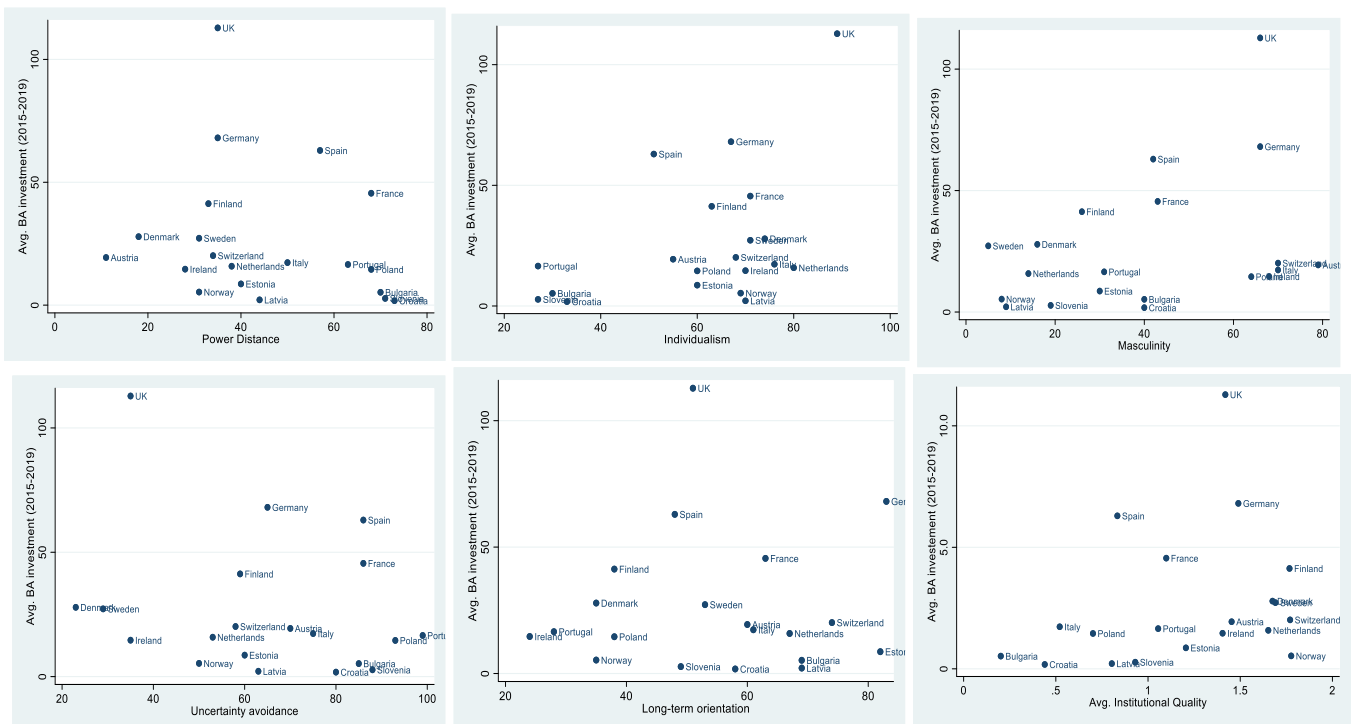


Table 4 gives in-depth insight into the data, arranges countries on the basis of their average BA activity during 2015-2019, and represents the relative status of countries on all explanatory dimensions around mean values. According to the given information, the top four countries in terms of BA activity are the UK, France, Spain and Germany. These top countries have similar economic environments pattern but differ in institutional dimensions. Their situation gives an indication that countries can excel in BA activity by maintaining a favourable economic environment. Furthermore, political instability may not be a challenge in developed economies compared to developing ones (Scheela et al., 2015) because all four of the top countries have low political stability.

On the other extreme of the data, Bulgaria, Slovenia, Latvia, and Croatia are showing low BA activity. The common point in these countries is a lack of overall institutional quality as well as low government R&D spending. Their pattern gives an indication that institutional quality as well as R&D spending are crucial for BA activity along other dimensions. Furthermore, another notable country which lies almost in the middle position is Italy. This country lacks all supportive institutions (culture as well as institutional quality) and has low R&D spending, while a favourable personal income tax rate and BA incentives are present. This highlights the significance of taxes and BA incentives for BA activity, as well as the fact that countries cannot excel fully in BA activity without having some supportive institutions. Switzerland, a country falling into the top ten according to BA activity, has supportive institutions, taxes, and high R&D, but lacks BA specific incentives. This draws attention to the importance of BA specific incentives, which is further made clear by looking at the countries in the lower tier of BA activity. Overall, we can say that each element contributes uniquely to better BA activity and can successfully explain the differences among countries in BA activity. Moreover, countries can get synergistic benefits by maintaining a good mix of these elements.

Table 4. Status of countries on institutional and economic paradigms (2015- 2019)

S. no	Country	Average BA Activity (2015-2019)	Cultural Values					Economic environment			Institutional Quality					
			IDV ¹	MAS ²	LTO ³	PDI ⁴	UAI ⁵	PI Tax ⁶	RD ⁷	BA S.I ⁸	PS ⁹	ROL ¹⁰	V&A ¹¹	GE ¹²	RQ ¹³	COC ¹⁴
01	UK	892553600000	Yes	Yes	No	Yes	Yes	yes	high	1	No	Yes	Yes	Yes	Yes	Yes
02	France	224546400000	Yes	No	Yes	No	No	Yes	high	1	No	Yes	No	Yes	No	Yes
03	Spain	205332944000	No	Yes	No	No	No	Yes	high	1	No	No	yes	yes	No	No
04	Germany	135166200000	Yes	Yes	Yes	Yes	Yes	Yes	high	1	No	Yes	Yes	Yes	Yes	Yes
05	Finland	25654800000	Yes	No	No	Yes	Yes	No	low	1	Yes	Yes	Yes	Yes	Yes	Yes
06	Sweden	22195960000	Yes	No	No	Yes	Yes	No	low	0	Yes	Yes	Yes	Yes	Yes	Yes
07	Netherlands	18393760000	Yes	No	Yes	Yes	Yes	Yes	high	1	Yes	Yes	Yes	Yes	Yes	Yes
08	Switzerland	12585060000	Yes	Yes	Yes	Yes	Yes	Yes	high	0	Yes	Yes	Yes	Yes	Yes	Yes
09	Ireland	11208480000	Yes	Yes	No	Yes	Yes	Yes	low	1	Yes	Yes	Yes	Yes	Yes	Yes
10	Italy	9744670000	No	No	No	No	No	Yes	low	1	No	No	No	No	No	No
11	Portugal	8536140000	Yes	Yes	No	No	No	No	high	1	Yes	No	Yes	No	No	No
12	Austria	6950070000	No	Yes	Yes	Yes	No	Yes	low	1	yes	Yes	Yes	Yes	Yes	Yes
13	Poland	6806790000	Yes	Yes	No	No	No	Yes	low	0	No	No	No	No	No	No
14	Denmark	6156000000	Yes	No	No	Yes	Yes	No	low	0	Yes	Yes	Yes	Yes	Yes	Yes
15	Norway	1561700000	Yes	No	No	Yes	Yes	Yes	low	0	Yes	Yes	Yes	Yes	Yes	Yes
16	Estonia	1049506000	Yes	No	Yes	Yes	Yes	Yes	low	0	No	No	Yes	No	Yes	Yes
17	Bulgaria	519704000	No	Yes	No	No	Yes	Yes	low	1	No	No	No	No	No	No
18	Slovenia	189740000	No	No	No	No	No	Yes	low	1	No	No	No	No	No	No
19	Latvia	158432000	Yes	No	Yes	Yes	Yes	Yes	low	0	No	No	No	No	No	No
20	Croatia	59020000	No	Yes	Yes	No	No	No	low	1	No	No	No	No	No	No

Note: 1 indicates individualism, 2 indicates masculinity dimension, 3 indicates long term-orientation, these dimensions carry 'Yes' (Favourable), if country's value on respective dimension is equal or greater than mean value of particular dimension otherwise 'No' (Unfavourable). 4 indicates power distance, 5 indicates uncertainty avoidance dimension, 6 indicates personal income tax rate, these variables carry 'Yes' (Favourable), if country's value on respective variable is equal or less than mean value of particular variable, otherwise 'No' (Unfavourable). 7 indicates government research & development expenditures, carries 'High' if country's value on R&D is equal or greater than mean value of R&D spending, otherwise 'Low'. 8 indicates BA specific incentives, carries '1' if country provide BA specific incentives (Tax grant, co-investments, guarantees), otherwise '0'. 9 Political stability, 10 rule of Law, 11 voice & accountability, 12 government effectiveness, 13 regulatory quality, 14 control of corruption carry 'Yes' (Favourable), if country's value on respective dimension is equal or greater than mean value of specific dimension, otherwise 'No' (Unfavourable).

Result

The graphical representations and Table 4 tell about the variant distribution of BA activity as well as unique contribution of each explanatory variable in making these variation across countries. Now, to get empirical evidence about the influence of selected variables (institutional quality, cultural dimensions, and economic forces) on BA activity across countries, we use the Prais Winsten regression with Panel Corrected Standard Error. Prior to the regression, Pesaran (2021) proposed a Pesaran-scaled LM test for checking cross-section dependency, when N is large and T is small. According to the results, there is a cross-section dependence among the samples. Pursuing on other issues of heteroskedascity and autocorrelation in panel data, Poi and Wiggins likelihood-ratio test (LR) and Wooldridge test also confirm the presence of said issues in current dataset. In such situation, our choice of PCSE panel regression is justified because it is the most appropriate method of estimation to deal with the problem of heteroscedasticity, cross-sectional dependency, and autocorrelation (Hoechle, 2007). For the PCSE model estimation in Table 5, we use the following specification for baseline model:

$$\text{Logged total BA activity} = \beta_0 + \beta_1 \times \text{powerdistance}_{it} + \beta_2 \times \text{individualism}_{it} + \beta_3 \times \text{masculinity}_{it} + \beta_4 \times \text{uncertainty avoidance}_{it} + \beta_5 \times \text{long term orientation}_{it} + \beta_6 \times \text{personal income tax rate}_{it} + \beta_7 \times \text{BA specific incentives}_{it} + \beta_8 \times \text{R\&D spending}_{it} + \beta_9 \times \text{institutional quality}_{it} + \beta_{10} \times \text{domestic credit availability} + \beta_{11} \times \text{cost of starting business procedures}_{it}$$

In Table 5, Model (1) is the baseline which represents result of PCSE regression for 20 countries during 2015-2019. Our study focuses on how heterogeneity in institutional quality, culture, and economic forces explains the differences in BA activity. Hypothesis 1 suggests that high institutional quality has a positive effect on the level of BA activity. The estimated coefficient of institutional quality is positive ($p < 0.000$), supporting Hypothesis 1. The influence of institutional quality in creating heterogeneity in BA activity across countries is large. BA activity increase 55% as a result of a 1 point improvement in the institutional quality of a country. This result is aligned with the findings of Li and Zahra (2012), who found formal institutions significant for VC activity.

Hypothesis 2(a) posits that countries having more power distance relationships among individuals will result in lower BA activity. The result of Model 1 shows an expected negative coefficient between BA activity and power distance, and it is statistically significant ($p < 0.052$). Hypothesis 2 (b) posits that countries having a more individualistic environment can have flourishing BA activities. Model 1 indicates that individualism is positively and significantly related to BA activity ($p < 0.000$). This result supports the finding of Cumming and Zhang (2019), who reported that individualistic context supports BAs. Hypothesis 2(c) suggests a positive association between a high masculinity oriented culture and BA activity. The estimated coefficient carries a positive sign and shows a significant relationship ($p < 0.000$), supporting the hypothesis. Hypothesis 2(d) shows that if there is high uncertainty avoidance present in a country's setting, then BA activity will be low. Model 1 results show an

unexpectedly positive coefficient for uncertainty avoidance and BA activity, but it is statistically insignificant ($p > 0.675$). This might be due to the high preference of BAs for risk taking (Cumming & Zhang, 2019). Hypothesis 2 (e) suggests that countries in which individuals think about having a secure future will be more involved in BA activity because people in long-term oriented societies try to save more, so eventually they can have a larger amount to invest. Our Model 1 shows that results are statistically significant ($p < 0.000$) but surprisingly show a negative coefficient for the relation between BA activity and long term orientation. The results of model 1 for the culture effect show that a 1-point increase in PD and LTO decreases BA activity by 13.4% and 34.5%, respectively, whereas a 1-point increase in individualism and masculinity increases BA activity by 91.1% and 55.4 %.

Hypothesis 3(a) proposes that countries with a favourable personal income tax rate can increase BA activity because low taxes save more portions of income that individuals can use to make investments, whereas high personal income tax rates can affect investment intentions due to a lack of funds. Our model 1 results show an expected inverse relation between BA activity and income tax rate, which is significant ($p < 0.002$). Moreover, a 1% increase in the personal income tax rate decreased BA activity by 9%. The same negative significant relationship has been communicated by Szerb et al. (2007) for informal investor emergence. According to Hypothesis 3(b), if a country provides BA-specific incentives (e.g., differential tax treatment of BA income, co-investment schemes between BA and the government, loan guarantees), BA activity will increase in that country. The result in model 1 shows a positive, significant ($p < 0.000$) association between BA activities in countries providing BA specific incentives. Hypothesis 3(c) proposes that countries that spend more on R&D can have higher BA activity because R&D spending results in more innovation and discoveries, which opens up more avenues for BAs to invest. Model 1 shows a positive and statistically significant ($p < 0.035$) link between government R&D spending and BA activity in the country. This finding is consistent with the findings of Bedu, Nicolas, and Montalban (2014), who discovered that state R&D spending is a significant determinant of private equity development. The Wald Chi square tests suggest that all models are significant ($p < 0.000$) and that baseline model (1) successfully explains 96% of the variation in BA activity.

Table 5. Regression with Panel-Corrected Standard Error

Model	Baseline (1)	(2)	(3)	(4)	(5)	(6)
Institutional Quality	0.55*** (0.141)	0.23*** (0.053)	0.30*** (0.098)	0.59*** (0.147)	1.13*** (0.195)	-
Power distance	- 0.13* (.069)	-0.000 (0.025)	-0.14*** (0.049)	-0.11 (0.079)	-.255*** (0.095)	0.053 (0.102)
Individualism	0.91*** (0.131)	0.64*** (0.071)	0.25*** (0.084)	0.90*** (0.103)	0.991*** (0.129)	1.123*** (0.139)
Masculinity	0.55*** (0.100)	0.29*** (0.038)	0.26*** (0.082)	0.55*** (0.111)	0.734*** (0.126)	0.846*** (0.137)
Uncertainty Avoidance	0.05 (0.113)	0.04 (0.033)	0.002 (0.082)	0.06 (0.134)	-.066 (0.157)	0.486*** (0.103)
Long-term Orientation	-0.34*** (0.086)	-0.19*** (0.046)	-0.17*** (0.058)	-0.33*** (0.088)	-0.404*** (0.093)	-0.378*** (0.116)
Govt. R&D spending	0.000** (0.000)	0.000* (0.000)	0.000** (0.000)	0.0000** (0.000)	0.0000** (0.000)	0.000* (0.000)
Income tax Rate	-0.09*** (0.029)	-0.06*** (0.011)	-0.03 (0.022)	-0.08** (0.034)	-.091** (0.036)	-0.003 (0.033)
BA specific incentive	1.93*** (0.272)	1.22*** (0.116)	0.69*** (0.167)	1.92*** (0.297)	1.912*** (0.31)	1.124*** (0.32)
Domestic credit	0.03***	0.014***	0.01***	0.03***	0.029***	-

availability	(0.003)	(0.000)	(0.002)	(0.004)	(0.006)	
Cost of business procedures	-0.03 (0.062)	-0.03 (0.022)	0.002 (0.044)	-0.02 (0.065)	-0.03 (0.069)	-0.15** (0.075)
GDP per capita	-	-	-	-	-0.000*** (0.000)	0.000*** (0.000)
Constant	19.72*** (0.495)	4.64*** (0.174)	15.09*** (0.305)	19.74*** (0.546)	20.95*** (0.745)	20.973*** (0.705)
Observations	100	100	100	95	100	100
Number of countries	20	20	20	19	20	20
Wald Chi-square	218868.53	24839.70	5379.34	188141.75	2058219.5	5277.524
R-squared	0.96	0.92	0.97	0.96	0.97	0.96
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000

This table reports PCSE regression estimation results of explanatory variables (institutional quality, cultural values and economic conditions) on BA activity. In Model (1) the dependent variable is total BA activity, in Model (2): number of BAs are taken as DV and in model (3): amount invested by BA is taken as DV. In Model (4) the DV is total BA activity with dataset excluding UK, in Model (5) GDP added as an additional control variable, in Model (6) to solve the issue of multi-collinearity, institutional quality and domestic credit variables are excluded whereas GDP is taken as additional control variable. Standard errors appear in parentheses. Significant at*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Additional Test

Impact on emergence of BAs: In Model (2), to ensure the consistency of results and to get an in-depth influence of selected factors, we checked the impact of explanatory variables on the number of BAs separately. This helps to identify which factors are influencing the emergence of BAs in a country. Results are almost consistent with Model (1), showing a high institutional setup is also good for promoting the number of BAs. Individualistic and masculine societies are the most suitable societies for BAs, whereas power distance is still negatively correlated with the number of BAs, consistent with findings by Szerb et al. (2007). However, economic factors are also influential in creating differences between the numbers of BAs among country's formal and informal institutions.

Impact on amount invested by BAs: In model (3), we check the power of explanatory variables to explain the differences in the amount invested by individual BAs separately across countries. Results show consistency over the positive role of institutional quality in this model also. The same is true for power distant societies that are not making huge BA investments, as we have already seen in model (1) that total BA activity is low in high power-distant cultures. Individualistic cultures are significant but less influential in creating differences in the amount of investment as compared to the emergence of BAs. A difference is present in economic factors in model (3) as compared to the rest of the models. Tax rates and R&D spending are important along BA-specific incentives. Countries which are providing BA specific incentives are at a great advantage in attracting BA investments as compared to countries which are not providing any incentives. This result is consistent with Mason and Harrison's (1999, 2000) findings that incentives influence the proportion of BAs' overall investment portfolio they allocate to invest in unquoted businesses. In addition, EIS schemes and co-investments significantly increase the volume of investment activity (Boyns et al., 2003; Hayton et al., 2008).

Country Effect: In model (4), we present our regression using the same dataset but excluding the outlier country, the UK. The focus is to check country effect as UK has high BA activity, which can lead the results. The results are similar to Model (1) except for the power distance dimension, which becomes statistically insignificant.

Role of GDP: Prior studies give mix results about the role of GDP and BA activity (Cumming & Zhang, 2019; Prohorous, 2019), to add to these studies we include GDP per capita as control variable in model (5). According to results, GDP per capita has significant influence on BA activity but coefficient carries negative sign. This is due to the issue of multi-collinearity among institutional quality, domestic credit availability and GDP per capita, as reported in correlation matrix earlier. In model (6), to avoid spurious results, institutional quality and domestic credit availability variables have been excluded, to see the true role of GDP. Result is showing positive and significant relation of GDP with BA activity, supporting Cumming & Zhang (2019) finding.

Discussion

Business angels play an important role in providing finance to start-ups, which are an important source of innovation and economic development. Little empirical evidence exists about the factors that can explain heterogeneity in BA activities across countries. The present study was designed to see how institutional quality, cultural compositions and economic environment of countries are playing role to develop BA activity and create heterogeneity across countries. The results of current study shows that institutional quality, culture, and the economic environment have a significant role in explaining the heterogeneity in BA activity across countries. It is interesting to note that countries having a good mix of supporting institutional setups along economic conditions are in better position to get the synergy benefits for BA activities.

Institutional quality found influential both on the emergence of BAs and the amount invested by individual BAs in a country. Countries with supportive institutional qualities such as political stability, good regulatory quality, government effectiveness, support for the rule of law, low corruption, and voice and accountability are better positioned to thrive in their BA markets. This is because good institutional quality ensures contract enforcement, protects minority rights, and better solves the issues of information asymmetry and resource allocation (La Porta et al., 1997; North, 1990; Vijayaraghavan & Ward, 2001), which are all important for BAs. This finding is consistent with Li & Zahra, (2012) who conducted a study to understand the role of formal institutions in the heterogeneity of VC across countries. Furthermore, the findings show that culture is equally important in enhancing BA activity with institutional quality. In individualistic and masculinity oriented environments, BA activity is more pronounced. Because these societies support risk taking behaviours, foster entrepreneurship, and motivate individuals to take initiative in challenging tasks and innovate (Li et al., 2013; Taylor & Wilson, 2012; Mihet 2013), as compared to societies that are low on these traits. The results for individualism support Cumming and Zhang's (2016) findings which reported individualistic context are better for BAs. High power distance and high uncertainty cultures are found to be obstacles in the way of BA activity because high power distance blocks the interaction and flow of ideas and shows high expropriation of minorities and agency problems are more pronounced in this type of society (Demirguc-Kunt & Maksimovic, 1998), whereas an uncertain environment less favours risk taking and innovation (Mihet, 2013). The results reflect those of Szerb et al. (2007) findings who found negative relationship between power distance and emergence of BAs. Surprisingly, long-term oriented societies are showing an inverse relationship with BA activity. This might be due to the fact that although LTO societies have funds, they like to follow conservative policies of holding cash and savings in order to increase their chances of survival in the future by dedicating some of their capital resources to long-term investments (Shao et al., 2013; Alipour, 2021). Long term oriented countries may get better BA activity by offering incentives because incentives found influential

in changing the behaviour towards risk-taking, innovation, and financing companies (McMullen et al., 2008; Sen, 1999).

In addition, it is seen that favourable income tax rates are significant because countries with low income tax rates favour their individuals' ability to save more funds for investments. A similar significant result is also reported by Szerb et al. (2007) for the emergence of BAs. Results on BA specific incentives highlight that countries which are focusing on providing BA specific incentives have more developed BA activity in terms of amount invested. This result supports previous studies, (Mason & Harrison, 2000) that incentives influence the proportion of BAs' overall investment portfolio they allocate to invest in unquoted businesses. In addition, EIS schemes and co-investments significantly increase the volume of investment activity (Boyns et al., 2003; Hayton et al., 2008). It is interesting to note that in an economic environment, factors affecting demand and supply are equally important. In this regard, government R&D spending is found significant factor in creating demand for BA activity. This is because R&D spending affects the rate of innovation and invention (Mairesse & Mohnen, 2004), which impacts the availability of opportunities. The result for R&D is similar to what was found for PE investment by Bedu, Nicolas and Montalban (2014).

Overall results highlight the fact that institutional quality, culture, and economic conditions are all simultaneously important and play a role in creating heterogeneity across countries. A good mix of all three factors (institutional quality, culture, and economic condition) ensures better BA activity. Our study theoretically contributes by confirming the findings of institutional theory and have certain policy implication. These findings may helpful to policy-makers in setting up supporting context for business angel activities. Policymakers need to work on all the aspects of institutional quality because it is seen as a diverse phenomenon (Islam & Montenegro, 2002; Kaufmaan et al., 2010). For example, legal and political aspects ensure to sort out information asymmetry problems and provide proper contract enforcement in a political and corruption free environment, which increases BA investment activity, as previously seen in the case of VC also (Li & Zahra, 2012). Countries having low BA activity should adopt policies that help to maintain an institutional environment where information is readily available, contracts are easily enforced and investors feel secure to bring positive change to BA markets. In addition, high quality institutional countries equipped with good regulatory and government effectiveness are better able to run and sustain BA specific policies and programmes (loan guarantees, tax credits). In contrast, countries lacking in BA activity need to work on these aspects to sustain supporting programmes and policies because strong institutions are compulsory for these programmes (Li & Zahra, 2012). Further, it is not sufficient to provide a good formal basis to promote BA activity; along line, policymakers should keep in mind the variances in cultural composition. Countries having supportive cultures (high individualistic and high masculinity) have developed BA activity. Countries having high risk avoidance and power distance orientation need to work on better incentive plans to promote BA activity because favourable incentives help individuals innovate more and finance companies (McMullen et al., 2008; Sen, 1999). Similarly, long-term oriented nations save more, but according to our study results, LTOs show a negative association with BA activity. This is an indication that countries' policymakers need to work on plans to motivate these LTO nations to take an investing initiative. In addition, results show economic factors have equal importance and cannot be neglected. It is observed that countries which provide favourable economic conditions (specifically, BA specific incentives, high R&D spending) have a competitive advantage over countries with a supportive culture (high individualism) but low R&D spending, BA specific incentive or both (Denmark, Switzerland). It is attention worthy for policy-makers because they cannot change culture, as it takes time, but they can focus on designing BA-specific incentives directly or by way of setting up good

institutional quality, which will eventually ensure good policy implementation to foster BA activity.

Limitation and future direction

Our paper contributes to the emerging literature on BA activity by providing simultaneous insight into three major predictors: institutional quality, culture, and economic conditions. This study under economic factors adds “government R&D spending” as a new determinant of BA activity and also gives major insight on the synergistic role of institutions and economic environment. Despite this, our paper is subject to several limitations. Firstly, as previously mentioned, it is not possible to get full and reliable data on BA activity because of the anonymous nature of BAs. For this reason, we collected data from EBAN reports that covers only 10% of visible BA activity. Due to the non-availability of BA activity data in developing countries, this paper could not incorporate comparison analysis at a higher level. Secondly, to avoid multi-collinearity issues and a small dataset, we did not add more factors (e.g. gender role, labour market rigidity, entry barriers). Future researchers can work to compensate for these shortcomings by examining a larger dataset that includes both developed and developing countries, as well as more influential factors. Our research focused on country level differences in BA activity by considering factors such as formal, informal institutions and economic conditions as constraints. Further studies can see the differences at a regional level also. For cultural measurement, we employed Hofstede’s dimensions. Future studies can test cultural influence with GLOBE value. Similarly, we employed WGI to measure institutional quality, future studies can deploy other indexes to confirm the relevancy of institutional quality.

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Appendix:

Principal components/correlation

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	5.078	4.434	0.846	0.846
Comp2	0.644	0.499	0.107	0.954
Comp3	0.146	0.078	0.024	0.978
Comp4	0.068	0.024	0.011	0.989
Comp5	0.043	0.022	0.007	0.997
Comp6	0.021	.	0.004	1.000

Principal components (eigenvectors)

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Unexplained
Voice&accountability	0.430	-0.066	-0.236	-0.858	0.137	0.016	0
politicalstability	0.291	0.937	0.193	0.022	0.014	-0.007	0
Govt.effectiveness	0.432	-0.060	-0.410	0.401	0.349	0.599	0
Regulatory quality	0.407	-0.298	0.810	0.051	0.292	0.025	0
Rule of law	0.435	-0.091	-0.285	0.306	0.105	-0.785	0
Control of corruption	0.434	-0.131	0.039	0.080	-0.873	0.157	0