ASSESSMENT OF BUSINESS ANGEL ACTIVITY IN NORTHERN EUROPEAN COUNTRIES

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Abstract. Business angels are one of the main sources of financing for innovative start-up companies. In this regard, it has been discussed in the existing literature that policy-makers and stakeholders are in great need for a tool to measure the level and scale of the development of the business angel market. It has been also mentioned that business angel activity in different countries is highly heterogeneous.

However, so far in the existing literature the comparison of the level of business angel activity in the countries of Northern Europe has not been made. Therefore, the aim of our research is to compare the level of the visible business angel market activity in Northern European countries. To conduct a comparative assessment of the business angels' activity, we used the Business Angel Activity Index calculation methodology developed by us. In this methodology, we justified the set of indicators and the weight of indicators for the calculation of the composite index. We have discovered that in 2016 – 2017 Estonia and Finland demonstrated the highest level of business angel activity among the countries of Northern Europe. We have also established that population size, the size of economy and GDP per capita rate in the Northern European countries are not the main factors that have a considerable impact on the level of business angel activity. Moreover, we confirm that business angel activity in the countries of Northern Europe is highly heterogeneous. We have also found that high scores of the ratio of the number of business angels to the working population in particular countries do not guarantee high level of business angel investment activity in these countries.

The paper also discusses the number of factors ensuring high business angel activity.

Keywords: business angels, business angel activity, business angel investment, Northern Europe.

JEL classification: G24, E22, C18.

Introduction

Business angel (BA) investment is the most significant source of risk capital for new and emerging entrepreneurial businesses (Mason, 2008; Harrison et al. 2010; The European Confederation of Angel Investing, 2015). The vast majority of early stage investments are made not by venture funds, but by business angels (Aridi, 2018). According to EBAN (2017), the amount of BA investment in Europe in 2017 constituted 55.3 % of the total amount of early stage investment.

Therefore, policy-makers and other stakeholders urgently need a tool to measure the level and scale of BA market development (Mason and Harrison, 2008). It is important to monitor not only the size of the market, but also other parameters and factors that characterize activity and efficiency of BAs, as well efficiency of the state policies aimed at promotion of BA activity (Wang et al., 2016).

Researchers note that there are several methods to obtain information on the invisible BA market activity, although each of them has certain limitations and some methods come at a considerable price (Mason, 2016). Although visible BAs constitute only the smallest fraction of all BAs, the data on the investment of BA networks and groups provide unique and valuable information on the BA investment trends (Mason, 2016). European Business Angel Network (EBAN) statistics on the visible BA market are based on the data of BA networks (EBAN, 2017). In addition, EBAN statistics on the visible BA market activity are in open access and in 2017 they provided the data on the number of BAs and the volume of their investment for 38 European countries. Despite certain limitations of the visible BA market statistics, they are used by the European Investment Fund (Kraemer-Eis et al., 2018).

Analysing of the existing literature it may be concluded that comparing the level of BA activity or measuring the BA market such indicators as the ratio of the number of BAs to the working or adult population, total investment amount, and the share of investment in a country's GDP are used most

frequently. There are only a few studies that specifically address the comparison of informal investor and/or BA activity in at least some countries of Northern Europe, for example, Bygrave (2009), Diaz-Moriana and O'Gorman (2013), Owen and Mason (2019).

However, the existing literature does not provide the answer to the question whether higher BA activity is characteristic of the countries with larger population, with higher GDP, or of the countries of "new Europe" and "peripheral" economies. In addition, researchers do not agree on whether certain differences in GDP per capita are the factor having an impact on the number of BAs. Such comparison has not been made, thus, respectively, so far it is difficult to say which countries of Northern Europe demonstrate higher BA activity.

Considering the above-said, the aim of our research is to compare the level of the visible BA market activity in Northern European countries considering several research questions. Firstly, the research aims to determine the degree of heterogeneity of the level of BA activity in the countries of Northern Europe; secondly, whether the level of BA activity is higher in the countries with higher GDP, GDP per capita and larger population aged 18 - 64 years; thirdly, whether the number of BAs is the factor having a significant impact on the volume of BA investment. And fourthly, what is the level of BA activity in the countries of "new Europe" and countries with peripheral economies as compared to other Northern European countries.

Based on the methodology for comparative assessment of BA activity we have developed (Prohorovs et al., 2019), we have presented empirical evidence that GDP, GDP per capita, and population aged 18 – 64 years are not the main factors having an impact on the visible BA market activity. Moreover, we have found that categorization of a country into a group of countries of the so-called "new Europe" (EU13), that is, the countries with post-communist economy or into a group of countries with peripheral economy, is not a factor limiting BA activity either.

In terms of structure, the paper consists of the following sections: In the first section, we reflect on the results of previous research, in the second section, we consider the research methodology. In the third sections, we compare BA activity indicators of the countries of Northern Europe for 2016 – 2017. In the fourth section, we present the results of index assessment and classification of BA activity of the countries of Northern Europe. In the last two sections, we discuss the obtained results, draw conclusions and make recommendations for further research.

1. Literature review

The BA market is changing under the impact of various factors. Thus, the interest of venture capital funds to seed financing has decreased (Kraemer-Eis et al., 2013), BAs started to unite into syndicates (Mason and Botelho, 2013; Carpentier and Suret, 2015; Mason et al., 2016; IFF Research, 2017). In some countries, BA activity has been to a certain extent influenced by the financial crisis (Mason and Harrison, 2015; The European Confederation for angel investing, 2015).

Researchers find that BA market activity is highly heterogeneous in different countries (Burke et al., 2008; Landstrom and Mason, 2016; Prohorovs et al., 2019). Researchers of BAND network (2015) observe that BA markets are diverse and are characterized by different degree of maturity. Thus, the UK, France and Germany are the most developed BA markets in Europe, whereas in Eastern Europe most countries are still at a very early stage of development. In a recent publication, Finland was included into the group of European countries with developed BA activity, together with France, Germany, the UK and Spain (Kraemer-Eis et al., 2018). The level of BA activity in different Central and Eastern European (CEE) countries also varies considerably, Estonia being the country with the highest BA activity among CEE countries (Prohorovs et al., 2019). When compared to GDP, total BA

investment amounts are relatively high in Estonia and Finland (Kraemer-Eis et al., 2018). Owen and Mason (2019) find that insufficient BA investment is an essential barrier to development of a wider equity finance market for small peripheral economies and that BA community in Estonia is possibly weaker than its counterpart in Finland.

Most frequently, researchers compare countries considering the number of BAs (Karaomerlioglu and Jacobsson, 2000; Mason, 2006; Centre for Strategy & Evaluation Services, 2012) and the amount of BA investment (Mason, 2006; Centre for Strategy & Evaluation Services, 2012; Avdeitchikova and Hans Landström, 2016). Some researchers use the number of BAs as percentage of adult or working population for measuring BA activity (Wong and Ho, 2007; Centre for Strategy & Evaluation Services, 2012; Diaz-Moriana and O'Gorman, 2013). At the same time, some researchers use such indicator as investment as percentage of GDP (Karaomerlioglu and Jacobsson, 2000; Wong and Ho, 2007). Mason and Harrison (2008) point out that measuring BA activity the main focus in data collection should be primarily made on the investment activity rather than on investors *per se*.

Burke et al. (2008) point out that higher GDP per capita rate in a country has a positive impact on the possibility of emergence of business angels. This statement might have appeared reasonable because one of the preconditions for becoming a business angel is that a person should be a high net worth individual (Mason, 2008). However, the existing literature does not answer the question whether certain differences in GDP per capita rates are the factor having an impact on the number of BAs (Mason, 2008).

Summarizing the literature review, we would like to point out that the existing literature does not provide any comparative analysis of the BA activity in the countries of Northern Europe.

The great majority of researchers use absolute or relative BA investment and BA number Figures as the main indicators to measure the size of BA market.

The authors agree that the BA market is highly heterogeneous. Moreover, it is often mentioned in the literature that the highest level of BA market development is recorded in the UK, France and Germany, whereas in Eastern Europe most countries are still at a very early stage of development.

Although the question whether certain differences in GDP per capita rates are the factor influencing the number of BAs has been discussed in the existing literature, the researchers have not reached agreement on this issue yet.

In the literature we have reviewed, such issues as heterogeneity of the level of BA activity depending on the size of the economy (GDP) and population size, as well as depending on the fact whether a country is classified as a country with peripheral economy, have not been considered.

2. Methodology and data

To compare the level of BA activity in the countries of Northern Europe we have analysed which parameters researchers use to measure BA activity or BA market. For that purpose, we have selected twelve most frequently quoted papers on BA activity or BA market. The indicators that the researchers use for assessment of BA activity or BA market most frequently are the number of BAs and BA investment volume.

In order to compare BA activity indicators of different countries, we compare the relative rather than absolute indicator figures. Thus, in the present research, we will use the following indicators for assessment of BA activity: BA investment as percentage of GDP, investment rate as proportion of population aged 18 – 64, and the number of business angels as proportion of population aged 18 – 64. Inclusion of two BA investment indicators (both as a ratio to GDP and as a ratio to population)

into comparison of BA activity of different countries will adjust for possible disproportion in terms of GDP or population size.

Moreover, to make the assessment of BA activity of Northern European countries more accurate, we suggest introducing an additional, the fourth indicator – BA investment activity indicator. This indicator shows the amount invested by all visible BAs calculated per one BA.

To conduct comprehensive assessment of BA activity we have used the Business Angel Activity Index (BAAI) calculation methodology (Prohorovs et al., 2019), which substantiates the set of indicators and the weight ascribed to each indicator in the calculation of the composite index. Each of four indicators was given equal weight. This methodology implies using the data on the visible BA market for calculation of the indicators included in BAAI. To normalize all four indicators for calculating the composite BAAI index, we applied the Max normalization. BAAI was calculated as the average of normalized values of all four indicators.

As BA investment is characterized by certain cyclicality (Mason and Harrison, 2015), to increase validity of the obtained results all indicators used to compare the number of BAs and BA investment volume were calculated as mean for 2016 - 2017. In order to ensure symmetry of the calculations all indicators that were used in comparison of the number of BAs and BA investment volume were also calculated as mean for 2016 - 2017.

To obtain information on the number of BAs and BA investment volume the data of EBAN Statistics Compendium for 2016 and 2017 were used. To obtain information on GDP and population aged 18 – 64 years we used Eurostat data for 2016 and 2017.

Ten European countries are included in the group of Northern European countries, however, there is No valid source of information on the quantitative indicators of Iceland's BA market, for this reason, Iceland was not analyzed in this research.

3. Comparison of the business angel activity indicators of the countries of Northern Europe for 2016 – 2017

In order to analyse the data used for comparison of BA activity, in Table 1 we present relative values of the compared indicators and the ranking of Northern European countries based on the indicator scores.

The conducted analysis attests that the visible BA market of Northern European countries is highly heterogeneous. Depending on the type of indicator, indicator scores of the first and the ninth country (according to ranking) differ in the range from 4.2 to 31.7 times. With regard to the ratio of the number of BAs to adult or working population, the difference was 4.2 times, the ratio of BA investment to GDP – 31.7 times, the ratio of BA investment to adult or working population – 14.9 times, and the ratio of visible BA investment to the number of BAs – 8.5 times. Significant differences in the ranges among the scores of four indicators may confirm the view that application of only one or two indicators most frequently used by the researches – the number of BAs and amount of investment to GDP – are not sufficient to make an accurate assessment of BA activity.

Considering the data presented in Table 1, it may be observed that the high relative indicator score of the number of BAs does not ensure high value of any other considered indicator: ratio of BA investment to GDP, ratio of BA investment to population (18-64) and the ratio of the visible BA investment to the number of BAs. This may signal that the number of BAs is not the main factor determining the volume of visible BA investment, which supports the opinion of Mason and Harrison (2008) that measuring BA activity the focus in data collection should be made on investment activity, but not on the investors themselves.

Table 1

Data and ranking of the BA activity indicators of the countries of Northern Europe for 2016 - 2017

Country/ Indicator	Ratio of the number of BAs to population (18-64)		Ratio of BA investment to GDP		Ratio of BA investment to population (18-64)		Investment BA activity (ratio of visible BA investment to the number of BAs)	
	score, %	ranking	score, %	ranking	score, EUR	ranking	score, thous. EUR	ranking
Denmark	0.0065	8	0.0084	4	6.98	3	106.6	1
Estonia	0.0152	4	0.0444	1	12.34	1	81.5	2
Ireland	0.0263	1	0.0052	5	5.04	4	19.1	6
Latvia	0.0062	9	0.0102	3	2.18	7	35.1	4
Lithuania	0.0066	7	0.0037	8	0.83	9	12.5	9
Finland	0.0187	3	0.0182	2	12.17	2	65.1	3
Sweden	0.0137	5	0.0048	6	3.79	5	27.7	5
United Kingdom	0.0200	2	0.0043	7	2.58	6	12.9	8
Norway	0.0093	6	0.0014	9	1.45	8	15.7	7

Source: developed by the authors based on the data: EBAN Statistics Compendium, European Early Stage Market Statistics (2016 and 2017); Eurostat, Population on 1 January by age and sex (2018c); Eurostat, GDP and main components (2018a)

The analysis of each of the four BA activity indicators that we have conducted attests that the top four countries by the number of visible BAs to population aged 18 – 64 years includes Ireland, UK, Finland and Estonia. With regard to the ratio of the visible BA investment to GDP, the top four countries are Estonia, Finland, Latvia and Denmark. In terms of the ratio of visible BA investment to population aged 18 – 64 years, it is Estonia, Finland, Latvia and Denmark. Finally, in terms of the ratio of visible BA investment to the number of visible BAs, it is Denmark, Estonia, Finland and Latvia.

Having applied relative rather than absolute indicator scores in our analysis, we may observe that among the countries with the highest GDP and largest population, the UK was included in the top four by each indicator only once, whereas Sweden did not appear in the top four even once. If we had compared the absolute Figures of the number of visible BAs, the UK would have been ranked first and Sweden – second, whereas considering the amount of BA investment – first and fourth, respectively. At the same time, considering the absolute Figures of the number of visible BAs among the countries of Northern Europe, the UK 10.3 times surpasses Ireland, the country that was ranked first according to the relative value of this indicator, although judging by the relative score of the number of BAs, Ireland outperforms the UK by more than 31.5 %.

The case becomes even more evident if we compare the UK – an incontesTable leader by absolute Figures of BA investment volume – with the ratio of BA investment to GDP of Estonia's BAs. The value of this relative indicator of Estonia's BAs is 10.3 times higher than that of the BAs from the UK.

The ratio of BA investment to population aged 18-64 years in Estonia is 4.8 times higher than in the UK.

The indicator of BA investment activity in Denmark (investment volume per one average BA) is 8.3 times higher than the corresponding indicator in the UK.

Out of nine analysed Northern European countries, the UK may be considered a large country both in terms of population and GDP. Sweden can be considered if not a large country but at least not a small one, as Sweden is ranked second after the UK among the countries of Northern Europe both in terms of population (about 10 million) and GDP, which significantly exceeds the corresponding indicators of other Northern Europe countries. However, neither the UK nor Sweden was ranked

higher than fifth according to any of the three indicators characterizing the level of investment BA activity.

Table 2 presents the values and the rankings according to GDP per capita and the ratio of the number of BAs to population in the countries of Northern Europe.

Table 2

Score and ranking by GDP per capita and by the ratio of the number of BAs to population

Country/ Indicator	GDP per o	apita 2017	Ratio of the number of BAs to population (18-64)		
	score, EUR	ranking	ranking		
Norway	67,100	1	6		
Ireland	61,200	2	1		
Denmark	50,800	3	8		
Sweden	47,200	4	5		
Finland	40,600	5	3		
United Kingdom	35,300	6	2		
Estonia	18,000	7	4		
Lithuania	14,900	8	7		
Latvia	13,900	9	9		

Source: developed by the authors based on the data: EBAN Statistics Compendium, European Early Stage Market Statistics (2016 and 2017); Eurostat, Main GDP aggregates per capita (2018b)

GDP per capita in Norway is 1.65 times higher than in Finland, 1.9 times higher than in the UK and 3.7 times higher than in Estonia. At the same time, the ratio of BAs to population aged 18 – 64 years in Norway is 1.63 times lower than in Estonia, 2.01 times lower than in Finland and 2.15 times lower than in the UK. The comparison of the GDP per capita rates and the data on the number of BAs as percentage of population aged 18 – 64 years we have conducted demonstrates that in the countries with higher GDP per capita, higher GDP per capita rate does not have any positive impact on the number of BAs.

The differences in the ranking of the countries depending on the use of absolute or relative measurement units testifies that the researchers using absolute values in their measurements address the issue of the size of BA markets. The researchers using relative values measuring the BA market consider the level of BA (market) activity, which can also be considered as the level of efficiency of both BA community of a particular country and the entire ecosystem where this BA community operates.

Five main conclusions can be made considering the results of our analysis. Firstly, the visible BA market of the Northern European countries is highly heterogeneous. Secondly, in the countries of Northern Europe, the size of the economy, GDP per capita and population size are not the main factors determining the visible BA market activity. Thirdly, the number of BAs is not the factor that has a determining impact on the total investment amount of the entire visible BA community. Fourthly, to assess the level (and, to a certain extent, efficiency) of BA activity in definite countries the measurements should be made in relative values. And fifthly, the application of only one or two indicators most frequently used in research – absolute or relative indicator of the number of BAs and investment amount as percentage of GDP – is not sufficient to provide objective assessment of the level of BA activity.

4. Index assessment of business angel activity in the countries of Northern Europe

In the previous section, we have considered four indicators characterizing BA activity and the rankings of the countries of Northern Europe in accordance with the scores of each indicator in question. None of the countries demonstrated the same ranking by all four indicators. For two countries – Finland and Sweden – the difference in the ranking by different indicators constituted only one point, for other countries, the difference in the indicator rankings was two and more points, in case of the UK and Latvia this difference was six points. As the heterogeneity among the rankings by different indicators of BA activity of one and the same country was high, in order to make comparative assessment of BA activity of the countries of Northern Europe we used the methodology that we developed for comprehensive measurement of BA activity. This methodology is based on the calculation of the composite index – BAAI (Prohorovs et al., 2019). Normalized values of four indicators, the scores and ranking of the countries of Northern Europe according to the composite index of BA activity are presented in Table 3.

Table 3

Normalized values of the indicators, BAAI rates and the ranking of BA activity
of the countries of Northern Europe for 2016 – 2017

Country/ Indicator	Ratio of the number of BAs to population (18-64)	Ratio of BA investment to GDP	Ratio of BA investment to population (18-64)	Investment BA activity (ratio of BA investment to the number of BAs)	BAAI value	BAAI ranking
Estonia	57.57	100.00	100.00	76.42	83.50	1
Finland	71.04	40.94	98.61	61.07	67.91	2
Denmark	24.87	18.99	56.53	100.00	50.10	3
Ireland	100.00	11.71	40.79	17.95	42.61	4
Sweden	52.07	10.75	30.70	25.94	29.87	5
United Kingdom	76.12	9.78	20.87	12.06	29.71	6
Latvia	23.55	22.92	17.63	32.93	24.26	7
Norway	35.17	3.07	11.75	14.70	16.17	8
Lithuania	25.26	8.33	6.73	11.73	13.01	9

Source: developed by the authors based on the data: EBAN Statistics Compendium, European Early Stage Market Statistics (2016 and 2017); Eurostat, Population on 1 January by age and sex (2016 and 2017); Eurostat, GDP and main components (2016 and 2017)

The obtained results of the complex assessment are to a great extent unexpected, since in the existing literature Estonia is not included in the list of countries with the developed BA market or high level of BA activity. Moreover, Estonia is a small country, both in terms of the size of economy and population, and as noted by Owen and Mason (2019), both Estonia and Finland are peripheral economies.

Based on the results of a rather detailed comparison of each of the four indicators included in the composite index we made in the previous section, we can make several conclusions concerning the final ranking of BA activity of the countries of Northern Europe for 2016 – 2017.

Among the countries of Northern Europe, Estonia is the smallest economy, whereas the UK, Sweden and Norway are the 1st, 2nd and 3rd largest economies, respectively, however, the UK was ranked sixth, Sweden – the fifth and Norway – the eighth in the BA activity ranking. This may indicate that the size of economy is not a significant factor determining the level of BA activity of a country.

Estonia takes the seventh place among the countries considered in the present research according to per capita income, and this indicator in Estonia is twice as low as the corresponding indicator of

the UK, which takes the sixth position by GDP per capita among the considered countries. Comparing Estonia with the countries where GDP per capita is higher than in the UK, the differences in the score of this indicator are even greater, for example, the difference with Norway is 3.7 times. This may indicate that GDP per capita is not a significant factor influencing the level of BA activity of a particular country.

In terms of population aged 18-64 years, Estonia is the smallest country in the selection. In turn, the UK and Sweden take the first and second position according to this indicator among Northern European countries; moreover, population Figures aged 18-64 years in the UK and Sweden are several times higher than in any other country considered in this research. However, in the final ranking of BA activity of the countries of Northern Europe for 2016-2017, the UK takes the sixth position and Sweden takes the fifth. This suggests that population aged 18-64 years, that is, the working population, is not a factor having a considerable impact on the level of BA activity of a country.

According to the calculated composite indicator of BA activity of Northern European counties, the BA activity of the countries of Northern Europe in 2016 – 2017 may be classified as follows: Estonia and Finland – very high level of BA activity; Denmark and Ireland – high level of BA activity; Sweden and the UK – average level of BA activity; Latvia, Norway and Lithuania – BA activity below average level.

5. Discussion and conclusion

Until recently, the literature did not provide any evidence that BA activity Figures in Estonia are higher than in the countries of "old" Europe, which have higher level of economic development, as well as longer history of BA community development. On the contrary, it was noted that the UK, France and Germany have most developed BA markets in Europe, whereas in Eastern Europe most countries are still at a very early stage of development (BAND, 2015). It was mentioned that Finland and Estonia may be classified as small provincial economies and that BA community in Estonia is possibly weaker than that in Finland (Owen and Mason, 2019). Only in a recent study, Finland was added to the group of European countries with high BA activity, which includes also the UK, and it was mentioned for the first time that when compared to GDP, total BA investment amounts are relatively high in Estonia and Finland (Kraemer-Eis et al., 2018). Earlier it was mentioned in the literature that the level of BA activity in Estonia is higher than in Latvia (Prohorovs, 2014) and that it is the highest among CEE countries (Prohorovs et al., 2019). But BA activity rates in Estonia in 2012 were significantly lower than the corresponding indicators in Finland or Sweden in 2012 (Prohorovs, 2014). Considering the above-said, the obtained results of the comprehensive assessment of BA activity in Estonia may appear totally unexpected. However, indicator scores and the positions of Estonia in the ranking of BA activity by each of the four indicators - two first, one second and one fourth place - attest that the first place Estonia takes in the ranking of BA activity of the countries of Northern Europe is not caused by a possible mistake in the design of the composite BAAI. All the more so, two fist and one second place Estonian BAs take in the ranking of the compared indicators characterize specifically investment BA activity in Estonia. This is in agreement with the opinion of Mason and Harrison (2008) that measuring BA activity the focus in data collection should be made on investment activity rather than on the investors themselves.

Let us consider the changes in the indicator scores from 2012 to 2017 resulting in a considerable increase of investment activity of the Estonian BA community in five years' time.

In 2012, the ratio of the number of BAs to population in Estonia was 2.6 times lower than in Finland and 2.8 times lower than in Sweden. In 2016 – 2017, the ratio of the number of BAs to population in Estonia was only 1.23 times lower than in Finland and 1.11 times higher than in Sweden. The changes in the scores of this indicator occurred due to a very rapid growth of the number of BAs in Estonia – in the period of five year, the number of BAs in Estonia grew 2.98 times, in Finland – 1.47 times, and in Sweden it decreased by 5 %.

From 2012 to 2016 – 2017, investment BA activity rate in Finland increased by 3 %, in case of Sweden's BAs it increased by 1 %, and investment activity of Estonia's BAs grew 3.5 times. Amount of investment per one average BA in Estonia in 2016 – 2017 was EUR 81.5 thousand per year, which is 1.25 times higher than the corresponding indicator of the BA community of Finland and 2.94 times higher than that of the BA community of Sweden.

If in 2012 the ratio of BA investment to GDP in Estonia was 2.5 times lower than the respective indicator of BAs in Finland, then in 2016 - 2017 this indicator in Estonia became 2.43 times higher than in Finland.

The results of our analysis demonstrate that the rapid increase of the investment BA activity in Estonia in the period from 2012 to 2017 occurred both due to increase in the number of BAs and due to increase of the investment volume per one average BA.

Let us consider possible reasons for such considerable growth of BA activity in Estonia. BA activity in the European countries is potentially connected with more successful exits observed in Europe (Kraemer-Eis et al., 2018). According to Kraemer-Eis et al., it can be expected that the key stakeholders of the companies that exited successfully will become business angels and will offer their knowledge and financing to start-up companies. We also find that successful exit opportunities business angels may use to exit from investment could have become one of the main factors promoting significant growth of BA activity in Estonia in recent years. We would like to substantiate this point of view with some evidence. Skype, acquired for \$2.6 billion (BBS News, 2005), is one of the most characteristic examples to the point. "Skype has put the Estonian startup ecosystem on the map. Its founders – dubbed the Skype Mafia – have become active angel investors in the community, created angel groups, and gone on to found other companies" (Startup Angels, 2019). For example, former employees of Skype established Transferwise, which attracted \$116 million in venture funding (Startup Angels, 2019). Moreover, all three founding partners who established Karma Ventures – an early-stage venture capital firm, specialized in late seed and A round investments in promising tech startups – are former Skype engineers (Startup Angels, 2019).

Nevertheless, we consider that there are other important factors apart from the factor mentioned by Kraemer-Eis et al. (2018) that may promote growth of BA activity of a particular country. In our view, high valuation of start-up companies in the last investment round when exit has not yet occurred, that is, business angels have not yet earned money for further investment, may be another important reason promoting growth of BA activity. Transferwise and Taxify may be mentioned as examples of such companies in Estonia. May 2018 funding round with a \$175 million investment from Daimler, Didi and others led to a 1-billion-dollar valuation for the company (Taxify), making it a unicorn (Nair, 2018). The fact of high valuation of such companies as Transferwise and Taxify by venture investors is a psychological factor for BAs and may be related to the realm of the behavioral finance (Barberis and Thaler, 2003). This factor has a positive impact not only on BAs, but also on the potential BAs, because it demonstrates that angel investment may bring return with high multiplier. Although some researchers point out that in crisis periods BAs implement a more active

investment policy than VC funds, with certain caution it may be assumed that the impact of this factor is more explicit in the positive phase of a business cycle. However, the period from 2012 to 2017 is not considered the crisis period either in the world, Europe, or Estonia. In addition, the EU monetary policy in the considered period was favourable to investment rather than savings. Thus, the presence of the companies with Estonian roots that received high valuation by international investors could have had a significant impact on the increase of both the number of BAs in Estonia and their investment volume.

There is another possible reason for such significant rise of BA activity in Estonia. It has been discussed in the literature that venture investors may not succeed unless they participate in the international cooperation (Lerner, 2009). Estonia has demonstrated that a rapidly institutionalized network of business angels may establish international contacts and ensure leverage in private investment (Owen and Mason, 2019). Owen and Mason report that 43 % of investments of Estonian BAs were made outside Estonia either in Estonian enterprises that relocated to other countries or through international investor links, largely enabled by close ties with angel networks in Finland (FiBAN), St. Petersburg (SoBA), and Latvia. EstBAN unites not only BAs from Estonia, but also international investors from other European countries and the United Sates (Owen and Mason, 2019). In Estonia, apart from EstBAN, there are also several other BA unions, including SuperAngel Fond (Estonian Startup Leaders Club, 2019), and Ivar Siimar has been included in Top 40 Business Angels that are rocking Europe and help startups grow (EU Startups, 2017). The story of Taxify is another interesting fact about international cooperation of Estonian BAs. Prior to announcing a strategic partnership with Didi Chuxing, Taxify had raised over EUR 2 million in investment capital from Estonian and Finnish angel investors (Estonian World, 2014). In our opinion, bearing in mind the territorial proximity of Estonia and Finland, certain trans-border "clustering" of BA communities of these two countries has occurred, which is to a certain extent attested by cross-contribution and close cooperation between EstBAN and FiBAN (EstBAN, 2019; FiBAN, 2019). Moreover, taking into consideration that Estonia and Finland take the leading positions in the field of BA activity among the countries of Northern Europe, it may be assumed that "clustering" of BA communities of these countries is another factor that promoted BA activity in these countries.

In the conducted research, we provided comprehensive assessment of the visible BA activity of the countries of Northern Europe, and based on the obtained data we may consider the results achieved and make the following conclusions: Firstly, we have found that the visible BA market of Northern European countries is highly heterogeneous. The data we have obtained confirm the opinion of numerous researchers, for example, Burke et al. (2008), BAND (2015), Landstrom and Mason (2016), about high heterogeneity of BA market activity of different countries. That is, high heterogeneity of the market activity in Northern European countries is consistent with the global trend.

Secondly, we have discovered that in the countries of Northern Europe, the size of economy, GDP per capita and population size are not the main factors determining visible BA market activity. With regard to our statement that GDP per capita rate is not the factor determining the level of visible BA market activity in the countries of Northern Europe, the empirical data we have obtained confirm the findings of Mason (2008), at the same time contradicting the opinion of Burke et al. (2008). As regards the impact of population size and GDP rate on the BA market activity, we have not found any previous research addressing this issue, and thus our data may become the starting point for further research.

Thirdly, the results of our research demonstrate that the countries of Northern Europe with the highest ratio of the number of visible BAs to working population (Ireland and the UK) demonstrated only the fourth and the sixth largest value of the "Ratio of BA investment to population aged 18-64 years". Ireland and the UK took the fifth and the seventh position according to the "Ratio of BA investment to GDP", and according to "Investment BA activity" – the sixth and the eighth position. Considering the obtained results, it may be concluded that high scores demonstrated by a country with regard to the "Ratio of the number of BAs to the working population" do not guarantee it will reach high scores of the visible BA market investment activity.

We would like to point out that since in this research we aimed at comparison of the level of visible BA market activity in the countries of Northern Europe, we considered only some factors having an impact on BA activity relevant for our research.

The results of our research also show that in order to assess the level and to a certain extent the efficiency of BAs of particular countries the measurements should be made in relative values. In addition, application of only one or two indicators most frequently used in analysis – absolute and relative values of the number of BAs and investment volume to GDP – is not sufficient to provide an objective assessment of the level of BA activity.

The data presented in our research may be not completely accurate due to the following reasons. First, EBAN statistics on the visible BA market are not sufficiently precise (Centre for Strategy & Evaluation Services, 2012), as EBAN statistics may leave out the data on investment by some BA clubs and groups that are not members of the national BA networks or EBAN. The conducted analysis proves that the level of deviation reported by Centre for Strategy & Evaluation Services (2012) is not that substantial. Moreover, in recent years, the quality of statistics on the visible BA market has considerably improved. Therefore, even if there are certain differences in statistics on the visible BA market, which were mentioned in the research by Centre for Strategy & Evaluation Services (2012), the overall picture of BA activity in the countries of Northern Europe we have presented would remain the same. Second, possible insignificant deviations could have been conditioned by the fact that we conducted analysis of the data for a two-year period, and that, taking into consideration certain cyclicality of BA investment, perhaps is not sufficiently long research period. Thus, considering the above-said, we believe that our findings on the results of BA activity in the countries of Northern Europe relatively objectively reflect the existing trends concerning the level of BA activity in the countries of Northern Europe.

Recommendation for future research

In view of considerable growth of BA activity in Estonia in the period from 2012 to 2017, it may be expedient to identify and study in detail the factors having an impact on the increase of BA activity in Estonia and the factors influencing BA activity in other countries.

Bearing in mind that the number of countries considered in our research was limited to the countries of Northern Europe, in further studies of BA activity it may be practical to increase the number of countries analysed. It is also recommended to analyse countries from different geographic regions and the countries with even greater differences in the level of their economic development, considering in the analysis the countries with larger economies and larger population.

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