

than half (52.7%) in the creation of the added value. In 2016, the downward trend in the establishment of SMEs has stalled. Compared to other EU countries, Slovakia is characterized by high entrepreneurial activity, the dominant presence of microenterprises or the under-representation of women in the total number of entrepreneurs.

Based on the SBA's profile compiled for 2017, the European Commission assessed that the greatest strengths in the Slovak Republic were application of the principles 6 (access to finance) and 9 (environment), while the profound weaknesses were found in implementing principle 2 (second chance) and principle 4 (responsive administration). Area Skills and Innovation is assessed as stagnating.

Despite the profound role of SMEs in the economic development, they are often underestimated, viz. in the finance area. The analysis of the SMEs innovative activity of enterprises in Slovakia elaborated by the Statistical Office of the Slovak Republic shows that innovative enterprises in Slovakia are low in comparison with the other European countries. Innovative activity is directly proportional to the size of entities. It means, innovative activities have been realized especially in the large companies, while SMEs have to overcome many obstacles in the implementation of innovative processes and therefore they deserve more attention and assistance from the state.

## **2.2 ROLE OF THE INTERNATIONAL COOPERATION INTO INCREASING THE SMEs COMPETITIVENESS LEVEL IN POLAND**

### **Introduction**

Innovations as the main factor of competitiveness becomes one of the basic parameters of the SME sector evaluation in Poland, viz. competitive companies, whose economic activity leads to the market value increase in in the long term. On the other hand, independent expansion of the SME sector in Poland has a worrying tendency that negatively influences the innovation level and SMEs competitiveness.

Taken into consideration the difference between achieved revenues and incurred costs as well as comparing financial results of Polish companies with entities from other EU countries, it may be noticed that Polish enterprises are clearly less innovative than their competitors from the EU. In 2009, an "average Polish company" has occupied last places in the ranking of 26 countries regarding the amount of turnover with the result of EUR 0.54 mln in 2008, overtaking only Hungary, Romania, Lithuania, Portugal and Bulgaria. The most successful were companies from Luxemburg (EUR 4.1 mln), Germany (EUR 2.6 mln) and Holland (EUR 2.3 mln) (Łapiński, 2011, p. 24).

In 2015, financial situation of Polish business improved due to a better economic situation in the country and the EU. After economic growth inhibition in Poland in 2012-2013, in 2014 there was a visible rising trend (GDP growth amounted to 3.3%) continued in 2015 (3.8%). As a result, in 2015 basic economic values measuring companies' financial situation increased. Revenues and costs significantly rose, however it was the costs that unfortunately showed higher increasing tendency contrary to revenues (Łapiński, Nieć, Orłowska & Zakrzewski, 2017, p. 37). As a consequence, throughout 2010-2015 there was a clear rising trend in R&D spending in Poland, where the intensity of R&D work, i.e. the share of internal expenditures on R&D in

GDP reached 1% in 2015, in relation to 0.94% in 2014 and 0.75% in 2010. However, according to the data for 2014-2015, this level put Poland on the 12<sup>th</sup> place out of EU-28 (Łapiński & Nieć, 2017, p. 26). Comparing Return on Assets (ROA) (Sierpińska & Jachna, 2018, p. 201)<sup>1</sup> of the researched entities it may be unambiguously stated that the SME sector in Poland are more competitive compared to large companies. E.g., in 2010, ROA noted for companies with the workforce from 10 to 49 employees amounted to 5.93%, for medium-sized companies (from 50 to 249 employees) 4.56% and for large entities only 5.42% (decrease of 0.51 pp. in relation to small enterprises) (Przedsiębiorczość w Polsce, 2011, p. 135). On the other hand, in 2016, ROA noted for companies with the workforce from 10 to 49 employees amounted to 5.41%, for medium-sized companies (from 50 to 249 employees) 4.89% and for large entities only 4.47% (decrease by 0.94 pp. compared to small enterprises) (Przedsiębiorczość w Polsce, 2017, p. 139).

However, SMEs are less connected with foreign markets than large entities. The data of the export share in total revenues indicate, the bigger the exporting company is, the larger is the export share in the revenues from the total activity. Thus, in 2010, this share amounted to 21.3% for small exporters, 24.2% for medium-sized exporters and 30.8% for big exporters (Łapiński, 2011, p. 42). According to GUS (Central Statistical Office) in 2015, 4.4% of the enterprises operating in Poland (i.e. 83.8 thousand) sell their products abroad and only 1% (19.7 thousand) sell their services. Analyzing the data concerning microenterprises, only 3.1% export their products and 0.5% their services. The results of big business are much better. The sale of products abroad conducts 29.9% of small companies, almost half of medium-sized companies (46.3%) and 66.2% of large companies; sales of services is conducted by 9.9% of small, 24.6% of medium-sized and 56.9% of large companies (Łapiński, Nieć, Orłowska & Zakrzewski, 2017, pp. 39-40).

The *aim of our study* is to use the case study in relation to selected SMEs having their registered offices in Poland, which cooperate with large enterprises as well as with economic entities from the EU to prove that the condition to improve the innovation level constituting an important factor of SMEs competitiveness in Poland is the international cooperation development with holdings/concerns from Poland and other entities from the EU. We hold vertical and horizontal analyze. Coopetition is defined as a phenomenon, where competition and cooperation simultaneously appear of at least two entities which in this way strive for a better implementation of their goals or to achieve a mutual aim on the international level (Downar, 2004, p. 72; Cygler, 2009, p. 15; Biuletyn Statystyczny New Connect, 2018, pp. 422-426). Such cooperation should consist in the exchange of own resources, obtaining new ones from other EU companies, using available resources to make broad contacts with foreign partners and competing with each other. To prove the assumed hypothesis, author has assessed SMEs coopetition with economic entities from other EU countries, as well as with large domestic enterprises. Therefore, author made an analysis of the

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<sup>1</sup> Return on Assets (ROA) is a relation of net income to average total assets, amount elaborated on the basis of M. Sierpińska, T. Jachna (2018), *Ocena przedsiębiorstwa według standardów światowych*. Warsaw: PWN, p. 201.

researched companies, which are listed on the New Connect market based on the P/E ratio<sup>2</sup> (Biuletyn Statystyczny New Connect, 2018, p. 24; *Przedsiębiorczość w Polsce*, 2017, p. 176) and sales factor (Biuletyn Statystyczny New Connect, 2018, p. 22)<sup>3</sup>.

### **The impact of SMEs expansion in Poland on their innovation level in 2000-2016**

Innovation (Latin *innovatio*) is a sequence of actions leading to the production of new or enhanced products, technological processes or operational systems. This term was introduced to economy by Schumpeter (1960, pp. 104-116) indicating at the same time five cases when innovation appears, viz. (1) creating a new product; (2) applying new technology/production method; (3) creating a new market; (4) obtaining unknown resources; (5) reorganization of a particular economy sector.

Innovative activity of enterprises is a very broad notion; it relates to actions of scientific, technical, organizational, financial and commercial character, which lead to the implementation of innovations. As well, innovations are perceived as a basic instrument ensuring companies' competitive advantages (Arena, 2017, p. 162).

Innovation is distinguished by hard, purposeful, concentrated work demanding knowledge, diligence, persistence and engagement. It forces investors to use their strongest attitudes and it causes changes in entrepreneurs' behavior. R&D spending constitute the measure of innovation level (Aydin, Alrajhi & Jouini, 2018, p. 160).

The analysis of the amount of R&D spending in 2000-2016 shows a different level of companies' R&D spending worldwide. The highest amount has been noted in the USA and Japan. The lowest amount has been noted in Cyprus and Poland.

The basic aim of implementing innovation in enterprises is the pursuit of gaining competitive advantages on the market. Hence, the competitiveness level is a very important element of companies' development and consequently innovations, especially SMEs. According to Sztucki (2008), competitiveness is a set of actions owing to which market participants, striving to implement their interests and achieve profits, present to receivers more favorable than other companies purchase offers, more attractive products and services sold at better prices and with powerful advertisement. Porter (2001, p. 15) also presents competition as a rivalry between competitors.

The process of SMEs adjusting to current market requirements is permanent. Therefore, the analysis of a competitive position is an important element of a strategic analysis of a company. The strengthening of the SMEs competitive position from Poland have to put accent for the financial situation of the researched entities measured by the amount of revenues, costs of the sold products, the share of the revenues from export in the total revenues and ROA. Different factors influence the each of the abovementioned indicators (Leszczyński & Skowronek-Mielczarek, 2000,

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<sup>2</sup> P/E ratio is a relation between market capitalization and the sum of net profit of the last 4 quarters. This ratio was elaborated on the basis of *Biuletyn Statystyczny New Connect* (2018), Warsaw, p. 24 and K. Jajuga (2007), *Podstawy inwestowania na Gieldzie Papierów Wartościowych*. Warsaw: Warsaw Stock Exchange, p. 176.

<sup>3</sup> Sale factor is a relation between annualized turnover for the current period and market capitalization at the end of this period. This factor is elaborated on the basis of *Biuletyn Statystyczny New Connect* (2018), Warsaw, p. 22.

pp. 225-226). This situation is presented by growth rates of the chain indices from the sales of products, goods and services (*Table 2.2.1*).

**Table 2.2.1**

**Relative growth of the chain indices from the sales in 2000-2016 (%)**

Year	Total enterprises	Enterprises with 10-49 employees	Enterprises with 50-249 employees	Enterprises with the number of employees over 249
2000	-	-	-	-
2001	0.21	2.23	-1.26	1.16
2002	2.05	-3.76	0.53	4.77
2003	11.64	6.90	15.52	10.96
2004	17.34	23.60	17.98	15.20
2005	4.80	-1.92	4.11	7.25
2006	13.51	13.55	10.12	15.38
2007	14.05	7.43	15.89	14.89
2008	11.18	20.43	7.40	10.82
2009	0.25	3.86	-3.32	1.08
2010	6.14	-0.93	3.70	9.39
2011	-6.41	14.91	12.21	12.88
2012	3.84	3.67	4.16	3.74
2013	0,56	1.50	-1.68	1.34
2014	2.68	5.75	2.90	1.75
2015	3.35	4.17	3.29	3.10
2016	2.42	0.83	0.70	5.40

*Source: created by author based on Financial Results of Economic Entities in I-XII (2001, pp. 12-15; 2002, pp. 12-15; 2003, pp. 80-83; 2004, pp. 80-83; 2005, pp. 80-83; 2006, pp. 80-83; 2007, pp. 80-83; 2008, pp. 84-87; 2009, pp. 16-19; 2010, pp. 18-21; 2011, pp. 116-119; 2012, pp. 120-123; 2013, pp. 24-27; 2014, pp. 30-41; 2015, pp. 30-41; 2016, pp. 32-43; 2017, pp. 34-45*

**Table 2.2.2**

**Relative growth of the chain indices of own costs of sold goods in 2000-2016 (%)**

Year	Total enterprises	Enterprises with 10-49 employees	Enterprises with 50-249 employees	Enterprises with the number of employees over 249
2000	-	-	-	-
2001	0.62	2.60	-1.20	1.81
2002	1.48	-3.66	0.24	3.85
2003	10.42	6.06	14.61	9.48
2004	15.54	22.02	17.18	12.72
2005	5.36	-2.08	4.71	8.11
2006	13.21	12.89	9.05	15.67
2007	13.80	6.71	15.54	14.85
2008	11.81	20.43	8.01	11.61
2009	0.30	4.45	-3.30	1.00
2010	6.01	-0.97	4.08	9.00
2011	12.96	14.92	12.50	12.67
2012	4.60	0.90	4.40	5.70
2013	0.40	2.20	-2.20	1.00
2014	2.80	5.20	2.30	2.30
2015	3.30	3.70	3.20	3.20
2016	2.80	0.70	0.40	4.40

*Source: created by author based on Financial Results of Economic Entities in I-XII (2001, pp. 12-15; 2002, pp. 12-15; 2003, pp. 80-83; 2004, pp. 80-83; 2005, pp. 80-83; 2006, pp. 80-83; 2007, pp. 80-83; 2008, pp. 84-87; 2009, pp. 16-19; 2010, pp. 18-21; 2011, pp. 116-119; 2012, pp. 120-123; 2013, pp. 24-27; 2014, pp. 30-41; 2015, pp. 30-41; 2016, pp. 32-43; 2017, pp. 34-45*

As the data of *Table 2.2.1* show, amount of total revenues from the sales of products, goods and materials in 2000-2016 increased on average by 6.4%. The amount of revenues from the sales of products, goods and materials achieved by small enterprises increased on average by 6.2%, by medium-sized entities by 5.2% and by large economic entities by 7.2%.

Another value defining the SMEs development level in Poland is own costs of sold goods and their worth (*Table 2.2.2*).

As the data of *Table 2.2.2* show, own costs of the sold products and their worth in 2000-2016 increased on average by 6.2%. Own costs of the sold products and their worth in small enterprises increased on average by 5.9%, in medium-sized enterprises by 5.1% and in large companies by 6.9%.

Another value that influence the SMEs competitiveness level in Poland is the share of revenue from export in the total revenues (*Table 2.2.3*).

**Table 2.2.3**

**The share of export sales in the total revenues in 2003-2016 (%)**

Year	Enterprises with 10-49 employees	Enterprises with 50-249 employees	Enterprises with the number of employees over 249
2003	7.30	11.90	18.90
2004	8.00	12.00	20.00
2005	8.00	12.00	21.00
2006	8.00	13.00	23.00
2007	7.00	12.00	23.00
2008	7.00	12.00	22.00
2009	6.79	12.01	21.24
2010	7.52	12.82	22.46
2011	7.84	13.06	23.67
2012	8.24	14.55	24.17
2013	9.15	15.72	25.30
2014	9.66	15.81	25.48
2015	9.25	15.92	25.61
2016	9.64	16.91	26.64

Source: compiled by author based on *Przedsiębiorczość w Polsce (2010, p. 132; 2017, p. 161)*

As the data of *Table 2.2.3* show, SMEs had weaker connections with foreign markets than large entities. Revenues from total export sales in nominal terms increased on average by 1.6%, viz. by 14% in medium-sized companies, by 8% in small enterprises and by 23% in large companies.

To evaluate the SMEs competitiveness level in Poland, we take into consideration ROA constituting the relation of net profit to average total assets (*Table 2.2.4*).

As the data of *Table 2.2.4* show, in 2002-2016 small enterprises demonstrated the highest ROA compared to medium-sized and large entities. It happened, because small companies have used mainly own capital and large entities relied mainly on borrowed capitals (i.e. they incurred payments on credits). Contrary to large enterprises, small companies do not use so-called scale economy benefits (Ejsmont & Ostrowska, 2011, p. 34). Having evaluated the SMEs competitiveness level in Poland in relation to economic entities from other EU countries, as well as in relation to domestic holdings or concerns, unambiguous conclusions may be drawn.

**Table 2.2.4****Return on assets of the companies in Poland in the years 2002-2016 (%)**

Years	Small enterprises (number of employees 10-49)	Medium-sized enterprises (number of employees 50-249)	Large enterprises (number employees over 249)
2002	-1.01	0.62	-0.52
2003	5.80	1.59	1.93
2004	5.31	5.33	6.55
2005	4.95	4.41	5.00
2006	5.81	6.05	5.68
2007	6.97	6.23	6.24
2008	5.65	4.41	3.81
2009	5.43	4.70	5.03
2010	5.93	4.56	5.42
2011	2.40	4.24	6.12
2012	5.82	3.93	4.44
2013	5.05	4.29	4.66
2014	4.94	4.76	4.06
2015	5.25	5.10	3.79
2016	5.41	4.89	4.47

Source: compiled by author based on *Przedsiębiorczość w Polsce* (2009, p. 133; 2010, p. 129; 2011, p. 135; 2017, p. 159)

Data on revenues from the sales of products, goods and materials, as well as own costs of the sold products and their worth proved that SMEs do not have competitive advantages in relation to large domestic enterprises. The analysis of the share of export revenues in total revenues shows that small, medium-sized and large companies are uncompetitive with economic entities from other EU countries. However, the analysis of ROA stated that small enterprises may compete with larger entities. Economic crisis of 2008 has proved that small enterprises risk less, adapt better to the constantly changing environment and may compete with big economic entities both on domestic, as well as foreign market.

#### **The international competition impact to the SMEs competitiveness level**

The theory and the practice show that the level of competitive and cooperative relations is the basis for the competition model. Relating to the abovementioned, the intensity of competitive relations occurrence depends on the intensity of competitive and cooperative relations between SMEs, as well as corporations on both domestic and foreign markets (Bengtsson & Kock, 2000, p. 415). The intensity of competitive relations on the so-called international arena is connected with their frequency between the members of the structure in relation to the total number of possible competitive relations, what may be presented by formula (2.2.1) (Cygler, 2009, p. 41), where  $IC$  is the competition intensity;  $K$  is the number of competitors;  $i, j$  are constant parameters;  $CRK_{ij}$  is the frequency of competitive relations;  $N$  is the number of competitive relations between enterprises;  $Ex$  is the level of export of the companies competing on the international market.

$$IC = \frac{\sum_{i=1}^K \sum_{j=1}^K CRK_{ij}}{N} + Ex, \text{ where } i < j; \quad (2.2.1)$$

The cooperation intensity creates the function of creating cooperative agreements frequency in relation to the total number of possible connections between partners on the so-called international arena, what may be presented by formula (2.2.2) [ibid], where *ICOOP* is the intensity of cooperation; *COOP* is the frequency of cooperative relations; *M* is the number of cooperative relations.

$$ICOOP = \frac{\sum_{i=1}^K \sum_{j=1}^K COOP_{ij}}{M} + Ex, \text{ where } i > j; \quad (2.2.2)$$

Formula (2.2.3) *ICCOOP* makes possible to calculate the intensity of coepetition:

$$ICCOOP = \frac{\sum_{i=1}^K x \sum_{j=1}^K xCRK_{ij}}{\sum_{i=1}^K x \sum_{j=1}^K xCOOP_{ij}} + Ex \quad (2.2.3)$$

To sum up, it should be stated that entrepreneurs from the SME sector deciding to cooperate and compete with economic entities from other EU countries, as well as with domestic concerns or holdings perceive their interdependence through financial and technological benefits. The character of international coepetition indicates that it is a complex system analyzed vertically and horizontally.

### **The case study of the international vertical coepetition and the SMEs competitiveness level**

SMEs companies which want to be competitive in relation to domestic holdings or concerns and other EU entities need proper resources management, elaborated budget, proper financial control, effective communications, smoothness between different departments and size economic entities. For this purpose, it is necessary to elaborate a strategy of international vertical coepetition, consisting of technological connection of production and distribution with the sales or other processes connected with the functioning and competing of the companies on domestic and international market (Ejsmont, 2012, p. 361). Therefore, we have conducted the analysis of the researched enterprises, which are listed on the New Connect market based on the P/E ratio and sales factor. 332 companies were analyzed, from which 42 companies, which cooperate with domestic and foreign contractors were selected. Taken into consideration financial situation of the above presented characteristics of the selected companies, it is essential to compare the following indices (Jajuga, 2007, p. 175):

(1) P/E ratio, which is a relations of price to achieved profit. This ratio informs about the investment attractiveness of listed companies. The lower the ratio, the more attractive it is to invest in the shares of a given company;

(2) sales factor shows that the higher is its value, the more attractive it is to invest in the shares of a given company.

The phenomenon of international vertical coepetition has appeared in 20 listed companies (*Table 2.2.5*).

Based on the data concerning the amount of the analyzed indices, we conducted T-test for independent trials. The data is presented in *Figure 2.2.1*.

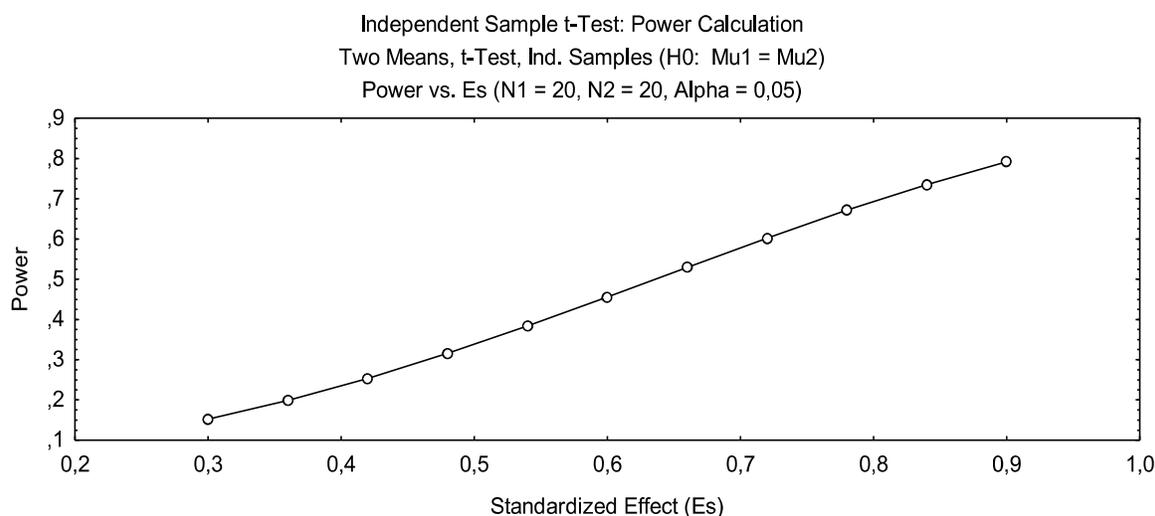
An important element of the conducted T-test is the so-called standardized effect, i.e. the effect expressed in convenient standardized units. In T-tests the standardized effect for independent trials is the difference of means divided by standard deviation.

**Table 2.2.5**

**The value of indices noted in companies functioning within international vertical cooperation listed in 2017 on the New Connect market (%)**

Name of the company	P/E ratio	Sales factor
TAMEX	16.10	2.00
INTERNITY	8.90	9.50
LZMO	0.00	44.30
I3D	0.00	160.30
ADMIRAL	0.00	12.10
AZTEC	8.70	6.70
LUG	15.80	14.70
APS	8.90	3.40
WERTHHOLZ	6.70	0.20
MERA	18.90	2.10
PLASMA	0.00	3.20
ROCCA	51.90	1.60
RSY	0.00	5.10
CSY	24.80	6.90
KLON	35.40	0.40
NAVIMORIN	0.00	0.70
HOTBLOK	0.00	30.70
INCANA	0.00	0.90
LUXIMA	34.90	39.10
ALUMAST	0.00	4.90

Source: researched by author based on *Biuletyn Statystyczny New Connect* (2018, pp. 10-23)



**Figure 2.2.1: Dependency of P/E ratio and sales factor on the international vertical cooperation based on the standardized effect**

Source: researched by author based on *Biuletyn Statystyczny New Connect* (2018, pp. 10-23)

In T-test analysis the statistical power appears the following ranges for the standardized effect (Statsoft.pl, 2018): (1) very weak result ( $E_s < 0.20$ ); (2) weak result ( $0.20-0.50$ ); (3) average result ( $0.50-0.80$ ); (4) strong result ( $E_s > 0.80$ ). In the context of testing statistical significance, author formulated a hypothesis stating that international vertical cooperation does not impact the increase of the innovation level

and what follows, also the SMEs competitiveness level in Poland, which is the opposite to what author would like to indicate. A very weak standardized effect - 0.3935 with the critical value  $t = 2.0244$  and the statistical power of the test for the required sample size  $N=20$  shaping on the level of 0.0796 confirms the alternative hypothesis stating that the condition to improve the SMEs competitiveness level in relation to domestic holdings or concerns, as well as to economic entities from other EU countries should be increased international cooperation considered vertically.

### **The case study of the international horizontal cooperation and the SMEs competitiveness level in Poland**

SMEs should elaborate a strategy of international horizontal cooperation, which is a process of integrating entities with similar functions on domestic and external markets channel under the control of an integrator. It may appear on different levels (Westbrock, 2017, p. 10). Therefore, taken into consideration financial situation of the above presented characteristics of the selected companies, similarly as in the case of international vertical cooperation, also in relation to international horizontal cooperation it is essential to compare the amount of indices: P/E ratio and sales factor of the companies listed in 2017 (*Table 2.2.6*).

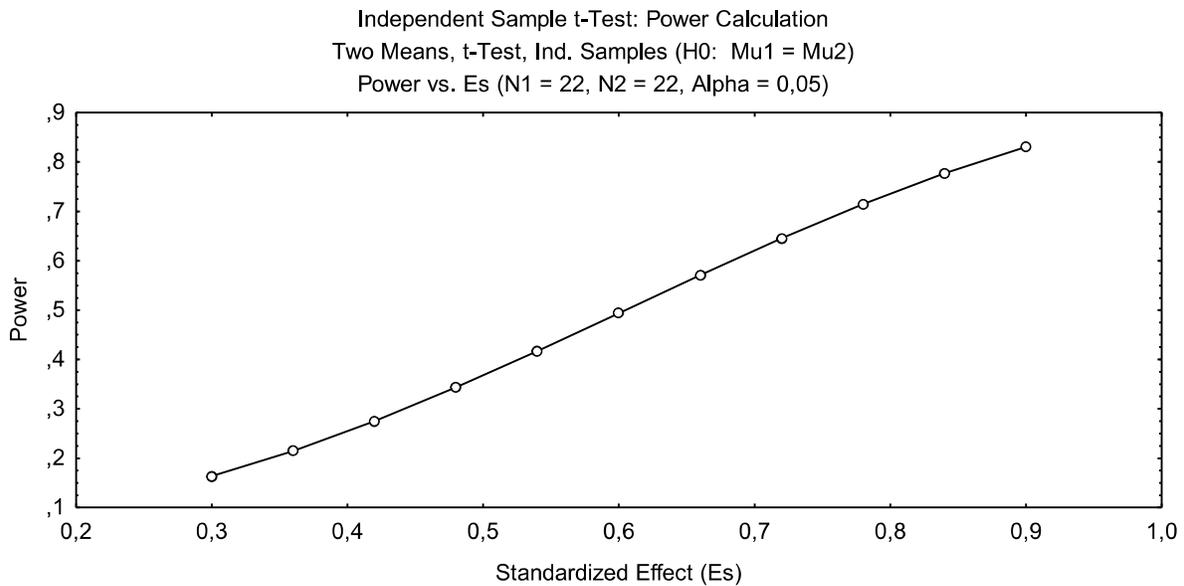
**Table 2.2.6**

#### **The value of indices noted in companies functioning within international horizontal cooperation listed in 2017 on the New Connect market (%)**

Name of the company	P/E ratio	Sales factor
BALTICON	12.80	5.70
EGB	27.80	0.00
ONICO	7.90	4.00
EUROTAX	11.00	0.80
DYWILAN	21.80	0.00
SZAR	6.60	35.10
BROADGATE	22.50	143.90
GREMPCO	5.50	2.20
MAKORA	0.00	14.00
GLOBAL TRADE	7.80	0.00
HORTICO	12.00	1.00
ESKIMOS	24.20	9.80
VCP	0.00	347.90
SYMBIO	0.00	1.40
ROVITA	2.30	2.30
TELIANI	7.80	8.00
KUPIEC	2.50	21.00
POLTRONIC	7.30	40.50
ACARTUS	0.00	59.50
IGORIA	0.00	3.70
HURTIMEX	10.60	0.60
GOLAB	0.00	3.20

*Source: researched by author based on Biuletyn Statystyczny New Connect (2018, pp. 10-23)*

Based on the data concerning the value of analyzed indices, we conducted T-test for independent trials. The data is presented in *Figure 2.2.2*.



**Figure 2.2.2: Dependency of P/E ratio and sales factor on the international horizontal competition based on the standardized effect**

*Source: researched by author based on Biuletyn Statystyczny New Connect (2018, pp. 10-23)*

In the context of statistical significance testing with the use of T-test, as in the case of researching international vertical competition, we formulated a hypothesis that international horizontal competition does not improve the SMEs competitiveness level in Poland as well (i.e. opposite authorial assumption). In this case, there is a very weak standardized effect -0.7298 that confirms that the companies listed on the New Connect market analyzed in terms of the international horizontal competition, only enter into the competition stage and competition on foreign markets. The critical value of the statistical power analysis is  $t = 2.0181$  for the required sample size  $N=22$  shaping on the level of 0.6572. T-test results confirm the alternative hypothesis stating that improving the SMEs competitiveness level raises the international horizontal competition with domestic holdings or concerns and entities from other EU countries. To sum up achieved results, we underline that vertical and horizontal international competition will contribute to the increase of the SMEs competitiveness level, especially in relation to large companies from Poland as well to economic entities from other EU countries, what will lead for obtaining stronger standardized effect, exceeding 0.80 in the case of international horizontal competition during T-test and then during the analysis of statistical power of this test. Thus, international vertical and horizontal competition, as well as companies' competition resulting in concluding agreements with foreign partners may intensify the complex internationalization process.

### Conclusion

The problem of the low innovation level and consequently the weak SMEs competitiveness level in Poland is significant. Due to the fact that throughout 2010-2015 there was an increasing trend of the R&D spending in Poland (indicator of innovations), the R&D intensity reached 1% in 2015 in relation to 0.94% in 2014 and 0.75% in 2010. However, it brought Poland to the 20th position out of EU-28. In our opinion, the international competition development can rise SMEs competitiveness.

Having considered coepetition into vertical and horizontal aspects, we showed its advantages based on a particular case. We analyzed 332 companies listed on the New Connect market, selected 42 ones which in reality operate within international competition, viz. vertical (20 companies) and horizontal (22 companies).

In the context of statistical significance testing with T-test use, author proved the alternative hypothesis stating that both international vertical and horizontal coepetition enhance the SMEs competitiveness level in Poland. Confirmation of this hypothesis is the result of the standardized effect calculated in relation to international vertical and horizontal coepetition -0.3935 and -0.7298 respectively. In the case of international vertical and horizontal coepetition this effect was very weak. The confirmation of the verified hypothesis was the result of the power of the test for the required sample size of N trial amounting to 0.0796 and 0.6572 respectively. Although the required N in the case of international vertical coepetition was 20 and in the case of horizontal coepetition was 22, results of the standardized effects and the power of the T-test confirm the validity of the research hypothesis. Therefore, increased international vertical coepetition resulting in concluding agreements with foreign partners may also intensify the complex internationalization process that will increase of the standardized effect analyzed by author.

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