

## Proposal of Indicators Measuring the Development of Companies Qualified to the NewConnect Focus Segment

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It is common opinion among the financial media and a wide range of investors in Poland that the NewConnect (NC) market is not an attractive place for investments. The NC market is dominated by penny companies with low liquidity of shares that encounter significant problems with fulfilling information obligations. This paper disputes this view by referring to companies from the NewConnect market. The authors aim at identifying new solutions, to improve the perception of the NewConnect market among all groups of its participants. These include the construction of new NC indicators: i) an indicator designed to measure the development level of companies from the NC Focus segment (NCGI-Focus) and ii) an indicator measuring the degree of changes in the market value of issuers from the same segment (NCFocusValue). This is supplemented by empirical results.

**Keywords:** NewConnect, alternative stock exchange, NC Focus, stock market indicator, stock market index.

## Wskaźniki pomiaru stopnia rozwoju spółek kwalifikowanych do segmentu NewConnect Focus

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Wśród mediów finansowych oraz szerokiego grona inwestorów można się spotkać ze stwierdzeniem, że rynek NewConnect (NC) nie jest atrakcyjnym miejscem do dokonywania inwestycji, że na NC dominują spółki groszowe o niskiej płynności akcji, że indeks obrazujący zachowanie kursów akcji emitentów notowanych na tym rynku znajduje się w wieloletnim trendzie spadkowym. W niniejszym artykule podjęta została próba polemiki z powyższym poglądem, a autorzy postawili sobie za cel wskazanie nowych rozwiązań, których wprowadzenie mogłoby w istotnym stopniu poprawić odbiór rynku NewConnect wśród wszystkich grup uczestników tego rynku. Rozwiązania te to wskaźnik mający za zadanie dokonywanie pomiaru stopnia rozwoju spółek z segmentu NC Focus (NCGI-Focus) oraz wskaźnik mierzący stopień zmian wartości rynkowej emitentów z tego samego segmentu (NCFocusValue). Autorzy referatu przedstawili nie tylko zarys metodologiczny, lecz także poparli zasadność wprowadzenia obu miar wynikami empirycznymi odnoszącymi się do okresu funkcjonowania segmentu NC Focus.

**Słowa kluczowe:** NewConnect, NC Focus, wskaźnik, indeks giełdowy.

**JEL:** G11, G14, G18, G23

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## 1. Introduction

In the face of recent publications in the Polish financial media which point, among others, to “the wane of NewConnect” (Torchała, 2018a), “a mess at the back of the WSE” (Słomski, 2018) and claim that “NC problems are getting worse, instead of being solved” (Torchała, 2018b), it is worth noting that the NewConnect alternative market (NC) is perceived mainly through the prism of the falling NCIndex value. Such an approach to the overall assessment of the state of this market should be considered very simplified. There are several arguments for this.

First, this is due to the nature of the NC market, which is dedicated to micro, small and medium-sized enterprises. Those companies are inevitably accompanied by a higher investment risk, lower liquidity and a relatively small capitalization, which affect high volatility of their share prices. During a market turmoil, this translates into higher price drops in comparison to companies from the regulated market. Second, due to the regulation of the Warsaw Stock Exchange [WSE], the NCIndex is reconstructed every quarter (excluding revisions made by adding new companies after one month from their debut). As a result, companies whose capitalization increased owing to speculative activities artificially pushing up quotations rather than due to positive fundamental changes frequently have excessive exposure in the index. Such an “artificial” increase in the company’s capitalization, however, is not fully reflected in the index value due to the frequency of its revision. Together with the increased capitalization, the company’s share in the index increases, but this happens only after its revision. In the absence of fundamental changes in the company, the “artificial” rise in stock price must at some point be adjusted downwards, which is fully reflected in the behavior of NCIndex and exerts a huge negative impact on it.

Despite the negative features described in the media, the NewConnect market offers many interesting investment objectives, characterized by a growing scale of operations over the past few years. The WSE has already taken action to distinguish this group of companies by constructing a separate segment under the name of NewConnect Focus. However, taking into account the common tendency for the media, analysts and investors to refer first of all to numerical values, it is necessary to consider introducing additional solutions enabling the identification and immediate assessment of the condition of this part of the market. This solution could be a synthetic measure evaluating the development of companies from the NC Focus segment constructed on the basis of the NCGI (NewConnect Growth Indicator) made by Sierpińska and Szczepankowski (2007, pp. 89–105) and supplemented by an indicator measuring the change in the market value of companies from this sector.

Taking into account the above discussion, the aim of this article is to present the perspective of implementing new solutions for the NewConnect

market in the form of (i) a synthetic measure of development of companies from the NC Focus segment and (ii) a synthetic measure of changes in market value of companies from this segment. We hypothesize that – contrary to the prevailing opinion in the media about the poor condition of the entire NewConnect market – companies from the NC Focus segment are developing not only in terms of their quality (measured by fundamental indicators) but also in terms of their value (measured by their capitalization). We also believe that the development of companies included in this segment can be illustrated by creating a qualitative indicator measuring fundamental development of NC Focus companies and an index measuring their stock exchange performance. This is extremely important for changing the perception of the NewConnect market by various groups of participants. In this way, we want to start a discussion on the need to add measures that capture the qualitative development of companies listed on the NC market to the existing NC indicators and indexes.

## **2. NewConnect Market in Poland – Diagnosis of Its Current State**

The NewConnect market was created in 2007, and its launch has become a part of the pan-European trend of creating alternative trading systems for micro, small and medium-sized enterprises (Zygmanowski, 2017, pp. 40–41). NewConnect operates as a full alternative trading system, i.e. the exchange market operating as an ATS (multilateral trading facility) organized by the Warsaw Stock Exchange (Kordela, 2013, p. 52). There were two stages in the history of development of the NewConnect market. The first period, lasting from 2007 to 2012 (quantitative development), was characterized by a very high growth rate of the number of debutants and a relatively small number of exclusions from trading. In the following years, a qualitative correction period lasted, and the number of exclusions exceeded the number of debuts (Śliwiński, Krawiec, & Nowak, 2017). At the end of September 2018, there were 395 issuers listed on the NC market with a market value exceeding PLN 7.8 billion.

As part of the NewConnect market infrastructure, we can distinguish two tools that group issuers – segments and indexes. On September 28, 2016, the WSE carried out the first qualification to the current NewConnect market segments: NC Focus, NC Base and NC Alert, which replaced the existing segments: NC Lead, NC HLR, NC SHLR. The purpose of these changes was to make it easier for investors to identify the condition of the companies from the NewConnect market. Qualification to individual segments is based on both qualitative criteria (e.g. compliance with the regulations in force at the ATS) and quantitative criteria (e.g. changes in the value of selected items from the financial statements). In accordance with the WSE assumptions, the NC Focus segment is targeted at compa-

nies with the best calculable parameters, the NC Alert – at companies in which something happens that should be a warning to investors, while NC Base – at companies with a potential for both promotion to the NC Focus segment and endangered qualification to NC Alert (Bankier, 2016). As at the day of the last qualification to segments before this article was written, i.e. September 26, 2018, there were 395 issuers listed on the NewConnect market; shares of 75 issuers were qualified to the NC Focus segment, shares of 230 to NC Base, and shares of 90 to NC Alert (Warsaw Stock Exchange [WSE], 2018).

The creation of new rules for segmentation by the ATS Organizer should be regarded as highly justified, especially considering the introduction of quantitative qualification criteria related to the financial situation of a given issuer. These segments significantly facilitated the distinction between the best companies and the worst ones. However, taking into account the fact that these segments have been functioning for more than two years, it should be stated that the awareness of their existence is still low among investors and the media. Rarely do both these groups refer directly to individual segments, usually using NCIndex as a measure of the NC market situation. Therefore, it seems justified to distinguish companies in an even more visible way, especially those that should enjoy the greatest interest from investors – companies qualified to the NC Focus segment.

The organizer of the ATS currently calculates and publishes one index – NCIndex, which was launched on August 30, 2007 with initial value set at 1000 points. Companies must meet the following criteria to qualify to the index (NewConnect, 2018): (i) the number of shares in free float is greater than 10%, (ii) the value of shares in free float is higher than PLN 1 million, (iii) the company cannot be classified to the NC Alert segment, (iv) the company cannot be marked in any special manner by the WSE (e.g. in bankruptcy). At the end of September, this index included 160 companies (out of 395 listed issuers) with the market value of the package included in the index of PLN 1.4 billion (the share of one issuer in the index computation cannot exceed 10%; debutants are qualified one month after their debut).

The purpose of NCIndex is to reflect the behavior of share prices (taking into account the income from dividends and pre-emptive rights) of the issuers included in the index. However, taking into consideration the nature of issuers listed on NewConnect, as already mentioned in the introduction, NCIndex is influenced by the specificity of the NewConnect market. In the current market situation, with the sole analysis of the constantly declining NCIndex level (Figure 1), this contributes to the distorted image of the NewConnect market, presented as “the market of penny companies reaches rock bottom (...) it remains an anti-advertisement of the stock market” (Torchała, 2018b).

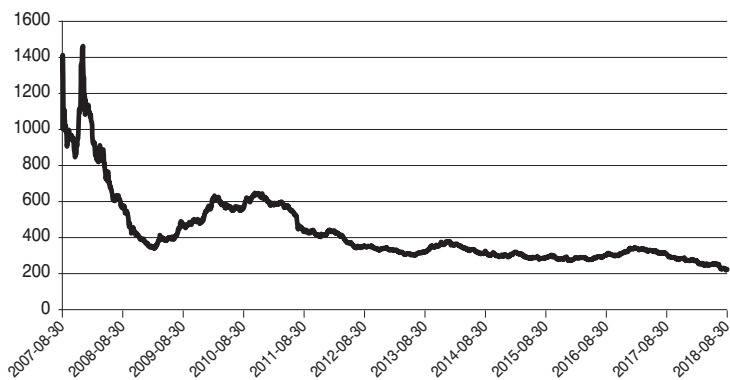


Fig. 1. NCIndex in the period from August 30, 2007 to October 18, 2018. Source: Own study based on data from stooq.pl.

The NewConnect market is dominated by small enterprises – at the end of September, the median market value of 395 issuers stood at just PLN 6.63 million, with the median of book value of PLN 5.15 million. At the same time, the NC companies are mostly family-owned, with founders of a given company as the majority shareholder. This affects the initial reluctance of founders to share co-ownership, at least at the relatively low level of valuations prevailing currently at the NC. As a result, it affects the level of free float, which is therefore limited. In addition, attention should be paid to the characteristics of offers preceding the debut on the NC market. They are mainly conducted as private placements; that is why the dispersion among new investors is significantly reduced.<sup>1</sup> All this significantly limits the liquidity of trading on the secondary market and translates into an increased volatility of stock prices, which negatively affects NCIndex value during a market turmoil.

### 3. Synthetic Indicator Measuring the Development of Companies From the NC Focus Segment

Sierpińska and Szczepankowski (2007, pp. 89–105) presented the concepts, methodologies and results of calculating various cyclical synthetic indicators and their partial measures. The aim of preparation of synthetic indicators was to measure the development of companies listed on the NC market. They created an indicator whose value is positively correlated with changes in the internal value of companies resulting from changes in their fundamental business performance and in appropriately selected economic and financial measures.

Out of four synthetic indicators used to measure changes in the fundamental value of companies from the NewConnect market, two related to

the dynamics of changes in absolute values of selected fundamental economic data (NewConnect Growth Indicator, NCGI – basic and alternative versions), and two based on relative measures assessing the profitability of companies (NewConnect Efficiency Indicator, NCEI – basic and alternative versions) were created. Among the proposed ratios, the authors recommended that the WSE should implement the basic NCGI indicator as the most accurate measure of the development of companies listed on the NC. This indicator was subsequently published until the first half of 2009, and its values during the publication period are presented in Figure 2.

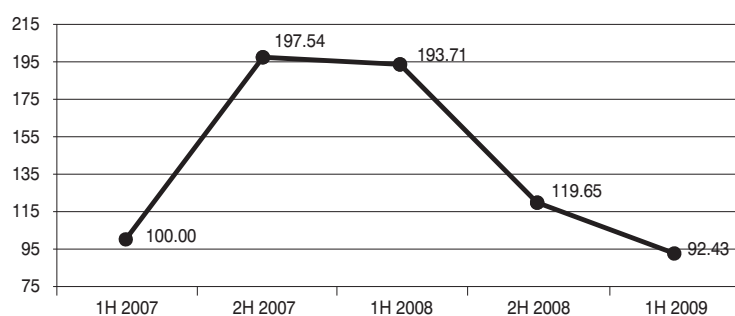


Fig. 2. Historical values of the NCGI indicator in the period from June 30, 2007 to June 30, 2009. Source: Szczepankowski (2010, p. 86).

Taking into account the arguments quoted earlier in the paper, we decided to introduce a number of changes in the Sierpińska and Szczepankowski's approach to the calculation of NCGI, which we propose to name NCGI-Focus:

- (i) being aware of the different quality of companies listed on this market, the calculation should be limited only to companies qualified to the NC Focus segment,
- (ii) an alternative version of the indicator should be adopted, which should include more financial data as in the form presented in Table 1,
- (iii) different weights for the data used in calculating the indicator (Table 1).

In the base version of the alternative NCGI indicator, the dynamics of changes in financial statement items were calculated on a half-year to half year basis, e.g. data for the second half of 2008 were compared with data for the first half of 2008. Such a way of comparing data can be considered insufficient, especially for companies that are characterized by high seasonality of financial results. Regarding the P&L data ( $\Delta P$ ,  $\Delta Z$ ,  $\Delta EBITDA$ ), we suggest using rolling data for the last twelve months, while for the balance sheet data ( $\Delta KW$ ,  $\Delta A$ ), we use data from the end of period. The introduced changes allow for taking into account seasonality in the results

generated by issuers and better reflect the degree of their development. Moreover, due to the availability of data on a quarterly basis, it is reasonable to calculate NCGI-Focus more frequently than NCGI, which would also eliminate a rather large drawback of the NCGI indicator, which was characterized by significant volatility.<sup>2</sup>

Partial indicators		weight
$\Delta P = (P_{t+1} - P_t) / P_t$	Change in revenues	0.40
$\Delta Z = (Z_{t+1} - Z_t) / Z_t$	Change in profit from sales	0.15
$\Delta EBITDA = (EBITDA_{t+1} - EBITDA_t) / EBITDA_t$	Change in EBITDA	0.20
$\Delta KW = (KW_{t+1} - KW_t) / KW_t$	Change in equity	0.15
$\Delta A = (A_{t+1} - A_t) / A_t$	Change in total assets	0.10

$$\text{Alternative version of NCGI} = 0.40 * \Delta P + 0.15 * \Delta Z + 0.20 * \Delta EBITDA + 0.15 * \Delta KW + 0.10 * \Delta A + 100\%$$

Tab. 1. Construction of an alternative version of NCGI (NCGI-Focus). Source: Own study based on Sierpińska and Szczepankowski (2008).

Table 2 presents NCGI-Focus calculations according to the above methodology based on data collected by Notoria Serwis since the NC Focus segment was created, i.e. from September 28, 2016 to the period including the most recently reported financial results, i.e. data for Q2 2018. In total, the initial sample consisted of 90 issuers.<sup>3</sup> The base date for the financial data used in calculating the value of the indicator is June 30, 2016, i.e. the last reporting period before including companies in the NC Focus segment. Thus, the base for the P&L data consisted of results for the period from April 1, 2015 to June 30, 2016 (last twelve months), while for the balance sheet data – data as at June 30, 2016.

While calculating the NCGI-Focus index, the composition of the NC Focus segment was not updated along with the periodic verification performed by the ATS organizer. However, in order to present the real NCGI-Focus behavior for the period from June 30, 2016 to June 30, 2018, we decided to take into account the fact that the following companies changed their quotation market to the WSE main market: VIVID (latest available financial data for Q2 2016), JWW and Unimot (latest available financial data for Q4 of 2016), Hollywood (latest available financial data for Q3 2017) and Sescom (latest available financial data for Q4 2017). Thus, the comparative base for particular periods was adjusted to capture the real development of issuers listed in the given period in the NC Focus segment.<sup>4</sup>

The values of the NCGI-Focus index show growth dynamics of issuers from the Focus segment determined on the basis of selected fundamental

Weight	Item	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018
0.40	Revenues [%]		13.93	14.53	2.32	1.23	-1.85	-0.55	3.75	4.65
0.15	Profit from sales [%]		1.33	-5.39	-1.58	-1.06	-1.45	9.12	2.10	7.70
0.20	EBITDA [%]		1.57	-11.41	-0.46	0.62	-3.96	6.35	-3.35	8.60
0.15	Equity [%]		3.05	0.84	4.30	-1.78	-0.64	-3.23	4.44	-0.40
0.10	Total Assets [%]		0.79	9.97	2.62	2.26	1.52	5.51	1.97	1.12
Change [%]										
			6.62	3.85	1.51	0.41	-1.70	2.48	2.01	5.00
NCGI-Focus value		100	106.62	110.72	112.39	112.86	110.94	113.70	115.98	121.78

Tab. 2. Values of the NCGI-Focus index and its components in the period from June 30, 2016 to June 30, 2018. Source: Own study.

	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018
MCap* performance [%]		6.5	16.4	3.6	-2.7	-4.9	-7.3	2.1	-7.6
NCFocus-Value	100.00	106.48	123.93	128.39	124.92	118.81	110.14	112.44	103.88

\* MCap – market value of companies included in NC Focus segment.

Tab. 3. NCFocusValue indicator in the period from June 30, 2016 to June 30, 2018. Source: Own study.



financial figures (Figure 3). The development of NCGI-Focus indicates a significant increase in the intrinsic value of companies from the NC Focus segment in the period covered by the analysis.

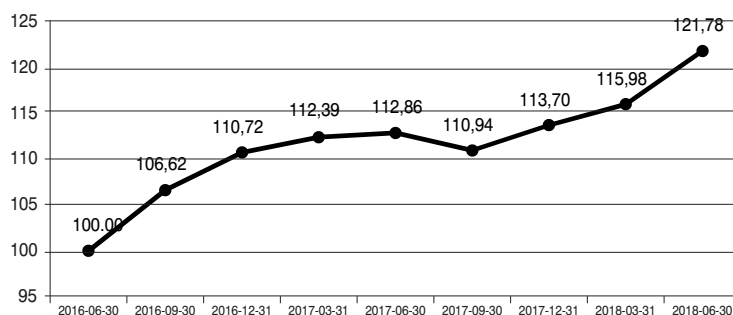


Fig. 3. NCGI-Focus indicator in the period from June 30, 2016 to June 30, 2018. Source: Own study.

#### 4. Synthetic Measure of Change in the Market Value of NC Focus Companies

Bearing in mind the NCGI-Focus indicator performance, an attempt was also made to verify the change in the market value of the entities included in the NC Focus segment versus changes in their fundamental values. On the basis of the same research sample, which was the original composition of the Focus segment subsequently adjusted by the companies changing the quotation market to the WSE main market, a synthetic measure of changes in the market value of quoted issuers named NCFocusValue was calculated. The values of the NCFocusValue index for the period Q2 2016–Q2 2018 are included in Table 3.<sup>5</sup>

Figure 4 presents changes in the NCFocusValue index against the NCGI-Focus, sWIG80 and NCIndex indices from Q2 2016 to the end of Q2 2018. At that time, the NCFocusValue increased by 4%, while the NCIndex value fell by 18.38%. Considering the fact that NC Focus brings together the best quality companies from the NewConnect market, it was decided to compare the behavior of the synthetic measure of changes in the value of NCFocusValue capitalization also with changes in the sWIG80 index value.

The obtained results show a strong link between the dynamics of changes in both indicators. The correlation coefficient for NCFocusValue and sWIG80 was at the level of 0.80, which indicates a strong positive relation between the two measures. The identified relationship seems to confirm the categorization by investors of issuers included in the SME segment within

the same risk group, regardless of the quotation market. Importantly, looking at the relationship in Figure 4, many arguments about the continuous decline in quotations on the NewConnect market due to the worse quality of issuers lose their importance. When we consider companies qualified to the NC Focus segment, we can notice that they mostly behave in a manner similar to the companies from a regulated market with a similar scale of operations (sWIG80). It can therefore be concluded that the level of capitalization of companies from the NewConnect market is, to a large extent, the result of a prevailing trend in the capital markets. This argument is confirmed by an additional comparison of the NCFocusValue with the NCGI-Focus. It is noticeable that there is a visible discrepancy between the improvement of the fundamental situation of NC Focus companies and the deepening declines in their market value since Q4 2017.

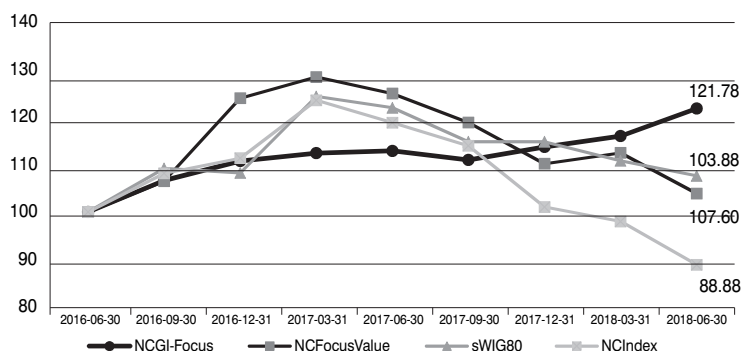


Fig. 4. Change in NCFocusValue versus NCGI-Focus, sWIG80 and NCIndex in the period from June 30, 2016 to June 30, 2018. Source: Own study.

As mentioned before, the behavior of NCFocusValue also looks favorable compared to changes in NCIndex. The greatest impact on the difference in their return rates is exerted by the inclusion of companies qualified to the NC Base segment in the computation of NCIndex, as they outnumber NC Focus companies. This comparison clearly indicates that the best issuers from the NewConnect market in terms of quantity and quality are rewarded by investors towards the entire market. This is another argument supporting the legitimacy of solutions in the direction proposed in the paper.

## 5. Discussion

In the case of the proposed solutions, several questions arise. These are issues related to: (i) the change in the composition of the NC Focus segment made periodically by the ATS Organizer, (ii) the moment of deter-

mining the NCGI-Focus indicator value and (iii) the weights of individual companies making up the NCGI-Focus indicator.

In case of periodical changing of the composition of the NC Focus segment by the ATS Organizer, there may be two critical moments: the first related to the addition of new issuers to the composition of the segment, the second – connected with the removal of existing issuers. The availability of financial data is the key to calculating NCGI-Focus, so it should be noted that if new issuers are added, the condition of availability of financial data must be met for at least the last 15 months.<sup>6</sup> Only this situation allows correct determination of the dynamics of changes in financial positions and NCGI-Focus calculations. However, this condition will always be met as NC Focus can only include companies listed on the NewConnect market for at least 12 months. On the other hand, when deleting issuers from the NC Focus segment, a correction should be made to the data for previous periods by deleting financial data of the company that has been eliminated from NC Focus. It is important that the corrected data should be the basis for calculating the current NCGI-Focus value (past values should not be adjusted).

A change in the composition of NC Focus does not create serious problems when calculating NCFocusValue. In the case of adding new issuers to the segment, it is necessary to include the value of their capitalization for the previous period in determining the current value of NCFocusValue. It will not be necessary to introduce any modifications in earlier periods. If companies from the segment are eliminated, the adjustment should be made in relation to the base value for the previous period.

The moment of determining the NCGI-Focus value remains a problematic issue. It would be legitimate to publish the value of the indicator immediately after the publication of periodic reports by the companies. According to the NC regulations, the day of publication of quarterly reports falls 45 days after the end of a given reporting period. Hence, the publication of NCGI-Focus could take place within 10 working days of that date. The availability of financial data (including data shared by Notoria Serwis) as well as the issue of companies that resign from publishing results for the fourth quarter due to the publication of an annual report within 80 days of the end of the financial year remain open questions. Particularly the latter aspect would require consultation with the ATS Organizer. This problem does not occur with NCFocusValue, which could be determined continuously. At the same time, it should be pointed out that NCGI-Focus could be published four times a year, not twice a year like its historical equivalent. This fact makes the proposed version much more informative for all participants of the NC market.

Another very important issue is the discussion on the consideration of weights for individual companies making up NCGI-Focus and NCFocusValue indicators. In the NCGI-Focus indicator proposed in the paper, simi-

larly to the NCGI indicator presented by the WSE in the years 2007–2009, financial data of individual companies were added up, and then the calculated changes in the values were analyzed. As a result, companies with above-average financial data had a very large influence on the value of the indicator.<sup>7</sup> Taking the above into account, it is reasonable to consider solutions that would limit the impact of companies generating relatively the highest nominal financial results compared to other entities from the segment. This limitation could take the form of allocating equal weights to each issuer or dividing issuers into groups of different weights depending on the reported results. The problem of too much influence of individual companies on the index level can be observed also in the determination of NCFocusValue or NCIndex<sup>8</sup> values. In the case of this measure, it is possible to propose similar solutions limiting the impact of the largest companies, as in the case of NCGI-Focus. They will then become a real measure of price changes in the market, and the impact of the companies that are outpaced due to their size (compared to other components of the index) will be limited.

## 6. Conclusions

The purpose of this paper was to present the perspective of implementing new solutions for the NewConnect market in the form of: (i) a synthetic measure of development of companies from the NC Focus segment and (ii) a synthetic indicator of change in the market value of companies from this segment. As a result of the analysis, two new indicators were proposed – NCGI-Focus, which is a modified version of NewConnect Growth Indicator (NCGI), and NCFocusValue. The task of the first would be to measure the development of companies from the NC Focus segment, while of the second one – to capture changes in the market value of companies qualified to the segment mentioned above. The obtained results allowed for a positive verification of the hypothesis accompanying this study and stating that the companies from the NC Focus segment develop in qualitative (fundamental) terms, but also – although to a lesser extent compared with fundamental terms – in quantitative terms (measured by their capitalization) than would be indicated by NCIndex. On this basis, we believe that it is possible and necessary to create indicators and indices on the NewConnect market that would show the development of companies included in the NC Focus segment not only in terms of capitalization but, above all, in terms of quality (fundamental).

The introduction of the proposed solutions by the ATS Organizer could significantly affect the perception of the NewConnect market itself. Particularly among the media, there is a widespread belief that this market focuses primarily on unreliable issuers in a difficult financial situation. The introduction of indicators would clearly differentiate the best companies

especially from those that violate the provisions applicable to the NC and may not only change the perception of the entire market but also increase the interest of NC Focus companies from various groups of investors. Both media and investors as well as issuers attach much more importance to quantitative measures illustrating the market situation (indicators, indexes) than to visual and qualitative parameters (segments).

In turn, the introduction of a new index measuring the change in market value on NewConnect, which would not contain restrictions relating to the volume and value of shares in free float but to the market value of companies in total, would also have a significant informative effect that would illustrate the collective behavior of the best NC companies' capitalization. It would be a reliable measure for the media, analysts and investors interested in this market for assessing sentiment to positively distinguished issuers.

Qualification to NCGI-Focus and NCFocusValue may also be attractive for issuers themselves and have a mobilizing effect on those who have been listed within the NC Base segment to date. This would not only be due to the fact that they would be visually distinguished within the NC Focus segment but also from the fact that these tools could be widely used by investors, which should translate into a growing interest in financial instruments of these issuers. Qualification to NC Focus would therefore bring clear benefits.

### Endnotes

- <sup>1</sup> Although the provisions of the ATS Regulations require that 15% of introduced shares must be in the hands of at least 10 shareholders, none of which holds shares representing over 5% of votes at the AGM, in many cases shareholders from private placements treat their investments as long-term ones and are not eager to sell shares right after the debut.
- <sup>2</sup> NCGI could change its value by up to 100 points between two measurements. This was a consequence of the dynamic development of the market in the indicated period (the debuting companies were added to the calculations, which significantly affected the research sample), but also the consequence of comparing changes in the financials on the half-year to previous half-year basis (seasonality impact on results). It should be pointed out that the volatility of the NCGI-Focus index should also be lower due to the fact that, since the creation of the NC Focus segment, its composition has fluctuated in the vicinity of 100 companies.
- <sup>3</sup> The following companies were removed from the sample: Ekokogeneracja, Macro Games, Plast Pack and Seka due to the fact that financial data of these issuers are not available in the Notoria Serwis database.
- <sup>4</sup> An example of adjustments made in the NCGI-Focus index is as follows: when calculating the NCGI-Focus value at the end of Q4r of 2016, the dynamics of changes in financial values of all listed issuers in the Focus segment (i.e. data for Q1–Q4 2016) were compared with financial data for the previous period of calculating the indicator (i.e. data for the period Q4 2015–Q3 2016). In the next period, i.e. when determining the NCGI-Focus value for Q1 2017, the data for Q1 2017 no longer included the value for the period from January 1, 2017 to March 30, 2017 for Unimot

and JWW due to the fact that these companies were listed on the regulated market of the WSE at that time. Therefore, both the data for the period of Q2–Q4 2016 (i.e. the data for three quarters added up to the results for Q1 2017 to obtain rolling data), as well as comparable data used to calculate the growth rate for the period Q1–Q4 2016 were corrected by subtracting the results generated by Unimot and JWW. Thus, an adequate comparative base was obtained for issuers who reported results for Q1 2017. No adjustments were made to determine the NCGI-Focus value in Q3 and Q4 2016 – there is no such basis, as both Unimot and JWW were then quoted on the NC; hence, the change in the financial statements indicated a change in the fundamental value of the companies from the Focus segment. An analogous procedure was applied in the case of other adjustments.

- <sup>5</sup> It should be pointed out that the calculations do not take into account changes in the composition of the NC Focus segment in Q2 2016–Q2 2018, except for changes resulting from the transition to the regulated market by Vivid Games, Unimot, JWWInvest, Sescom and Hollywood. In order to obtain a full picture of NCFocusValue, adjustments should be made in the composition of the measure corresponding to changes in the composition of the segment, made in accordance with the WSE principles. In addition, this measure does not take into account any additional restrictions on the construction of indices, relating to, inter alia, the minimum number of shares in free float, the value of these shares, or limits on the maximum share of a given company in the index. However, as indicated in the second chapter, the legitimacy of introducing such restrictions should be considered doubtful.
- <sup>6</sup> For example, if the addition to the segment occurred after the publication of financial results for Q1 2019, the issuer would have to provide data for the period Q1–Q4 2018.
- <sup>7</sup> An example of this is the impact of Onico on total revenues of NC Focus companies, e.g. in Q2 2018, the company generated PLN 789.6 million in revenues compared to PLN 1941.4 million generated by all companies included in the NCGI-Focus index survey.
- <sup>8</sup> In the case of NCIndex, on November 5, 2018, only two companies, Farm51 and KME, had a share in the portfolio totaling 20.8%, and the remaining 158 companies – 79.2% (<https://newconnect.pl/sklad-ncindex>).

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