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Expectations' Formation in Business Survey Data

Abstract

In this paper we conduct a three step analysis of business tendency survey data in order to establish (1) common factors driving responses to groups of questions in the business tendency survey conducted among firms in the manufacturing industry in Poland, (2) factors responsible for respondents' answers regarding assessments (present) and expectations (future), and (3) interrelations between current assessments and expectations. We start by performing a check of the factor structure with multi-group confirmatory factor analysis (MGCFA) models in order to establish common factors responsible for sets of answers in the area of assessments and expectations, respectively. Then, we proceed with structural equation modeling (SEM) framework in order to define period-specific relations between the factors. With the final structural model we show that most answers in the area of current assessments and expectations of companies are in line with the stylised facts. We also demonstrate that the companies' response pattern did not change during the financial crisis.

Keywords: business tendency surveys, confirmatory factor analysis, structural equation modeling

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1. Introduction

Referring to Katona's works (1946, 1947), there is a fundamental belief that business and consumer tendency survey data provide an insight into the economic situation of consumers and enterprises. Economic agents are believed to have an intrinsic knowledge of their own current and future situation but also are assumed to be able to assess current and future situation of the general economy. Due to this, tendency survey questionnaires are usually designed to cover four areas emerging from the two by two interactions: PRESENT and FUTURE, INDIVIDUAL (respondent's) and GENERAL (economic) situation.

A way in which those four areas interact in consumer tendency surveys was already subject to investigation both with respect to the European Economies (Bovi, 2009) and Poland (Białowolski & Dudek, 2008). Although these studies were based on aggregated data, the results suggest that there might be a causal relationship between the patterns of assessment and forecasts in the dimensions of general economic situation and household's situation. These interrelations were summarised in the mantra formulated by Bovi (2009), which states: 'As usual, it has got worse than I expected. Especially for the OTHERS. Nevertheless, I think that it will get better. Especially for ME.' This mantra clearly confirms the existence of two dimensions regarding the subject of question (ME and OTHERS) and, for each dimension, the two time frames (PRESENT and FUTURE).

An investigation of interactions between those four areas has never been conducted with respect to business tendency data, which creates a gap that we try to fill in with this paper. In order to investigate the interrelations between the answers to specific questions we advocate for an approach based on micro-level data. The need for a more profound, micro-level analysis with tendency survey data was already stressed by Paloviita & Viren (2012), who noticed that usually survey data analysis is limited to presentation of averages and rarely takes as the center point the behaviour of individual respondents.

The most common applications of business survey data are direct forecasts of economic variables (Białowolski, Kuszewski, & Witkowski, 2010, 2013; Siliverstovs, 2009) or tests of the rational expectations hypothesis (Davies & Lahiri, 2000; Zarnowitz, 1992). There is also a broad literature on econometric modeling of relations between the variables coming from the tendency surveys focused on time evolution of forecasts of individual forecasters (Koeberl & Lein, 2011; Paloviita & Viren, 2012). However, the main focus of the analysis presented in this paper is evaluation of the micro-level process of expectations' formation with regards to the situation of

a company and interactions between company's and the general economic situation.

As in the areas regarding company's present and future situation there are batteries of questions related to current assessments and expectations respectively, we decided to verify whether there are also stable concepts responsible for the mode of answering of individual companies with respect to all questions related to a given area. With this in hand, we subsequently investigate stability of the relations over time. The adopted methodology comprises:

(1) confirmatory factor analysis (cf Brown, 2006), as a tool for determining the common factors responsible for the mode of answering to survey questions, and

(2) structural equation modeling (cf Kaplan, 2009), employed in order to establish relations between factors and other variables, but also between factors related to current state and factors responsible for expectations regarding the future.

The main contribution of this article is the use of micro-based data to determine existence of concepts (factors) responsible for groups of answers in the business tendency survey questionnaire but also verification of the time-stability of obtained relations. Using common factor modeling in the field of business and consumer tendency surveys has constantly gained more attention of academics, but the most examples are based on aggregated data, ie factors are derived from aggregates (Costantini, 2013; Lemmens, Croux & Dekimpe, 2007). With such an approach, however, one does not search for common factors within a company (common factor that is accountable for the questionnaire responses) but searches for common factors that drive the changes in aggregates between time points. The approach proposed in this article, i.e. the use of common factors based on micro-level data and interrelations between them, is further supported by Picchetti (2012) who states : 'The optimal forecast method will depend on the stochastic process which is followed by the variable being forecast, and also by the interdependences in the relevant structural model.' It is a suggestion not only to use the structural equation modeling but also for a search of underlying concepts in the data.

Summing up, the main objectives of the paper can be stated as follows. The first objective is to verify the factorial structure of the data in business tendency survey questionnaire. The verification is conducted with respect to current assessments and expectations and provides a check whether the corresponding indicators of current assessments and expectations should be included in the two factors. If it is established, it might be claimed that

companies include the same set of indicators for representation of their current state and expectations regarding the future. The second objective of the paper is to check whether the same factor loadings can be imposed both on current assessment and expectations regarding future. With this asserted, it is possible to state that exactly the same influence of latent variables is present for current assessments and the expectations, i.e. the one point change in the latent factor describing current situation has the same impact on its indicators as the one point change in the latent factor describing future situation on its corresponding indicators. The third objective of the paper is to capture the relations between the current assessments and expectations. The predetermined structural relation at the current assessment and expectations levels are checked and an impact of current assessments on expectations about the future is verified.

Following the objectives, the paper is structured as follows. First, we introduce the conceptual framework of the model, provide the data source and basic information on the data. Second, we derive the structural relations within the current assessments and within the expectations regarding the future. At this stage we also compare the results and draw conclusions about similarity of current assessments and expectations. Then, we proceed with the structural equation model and check the postulated relationships between the current assessments and expectations, we verify their stability and provide the sources of strain. The final section concludes.

2. The data source and the conceptual model

The analysis is carried out on the data from the survey in the manufacturing sector conducted by the Research Institute for Economic Development, Warsaw School of Economics on the monthly basis. The questionnaire comprises questions referring to the production, orders, prices, stocks, financial situation, capacity utilization within a company but also the general economic situation of the country (detailed wording of questions in Appendix 1). All the questions are provided in a qualitative form, which allows for three types of answers: increased, remained the same, decreased or above normal, normal, below normal. Each question additionally exists in one of the two variants – referring to the past (current assessment) and referring to the future (expectations). Due to the fact that the question wording refers to forecasts made 3-4 months ahead, quarterly data are used for the analysis.

The sample consists of a panel of companies that respond to survey questions via post and e-mail questionnaires. The initial sample was a random group of companies selected from the Central Statistical Office register. The

average response in the period of analysis was 405, ranging from 328 (July 2007) to 529 (July 2010). The period of analysis covers 2005Q1-2013Q1.

We start the analysis with separate approaches to survey responses referring (1) to the current assessments and (2) to the expectations. Within each approach a search for a common driving force responsible for question answers is performed. The initial construction of the conceptual model is based on the assumption that assessments and predictions reported at the company level are driven by assessments and predictions formulated about the general economic situation. As Zarnowitz (1992) points out, "Macropredictions serve as important inputs to micropredictions". This clearly indicates the postulated causal inference going from macro- to micro-level indicators. Based on these assumptions and the accessibility of the data, we provide a first outline of the conceptual models present at the level of current assessments and expectations.

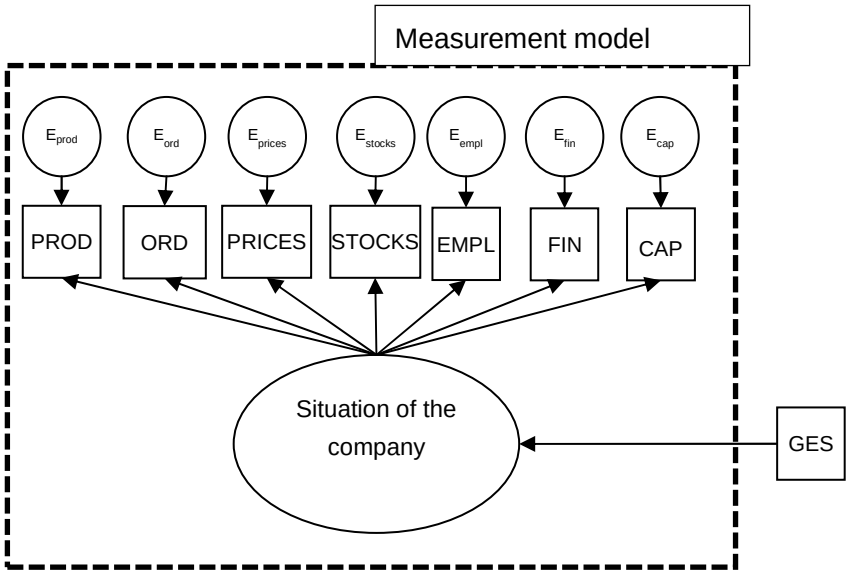

Figure 1. The initial conceptual model of the assessment of current situation (and expectations) of a company and the general economy.

Source: own compilation.

The conceptual model refers both to current assessments and expectations, however the final objective is to create a link between the responses to survey questionnaire regarding the current assessments and expectations. It is clearly the case that actual situation of a company has strong influence on its future, which is also observed in the aggregate data (Picchetti,

2012). Thus, the conceptual framework of the model comprising both states and forecasts is as follows.

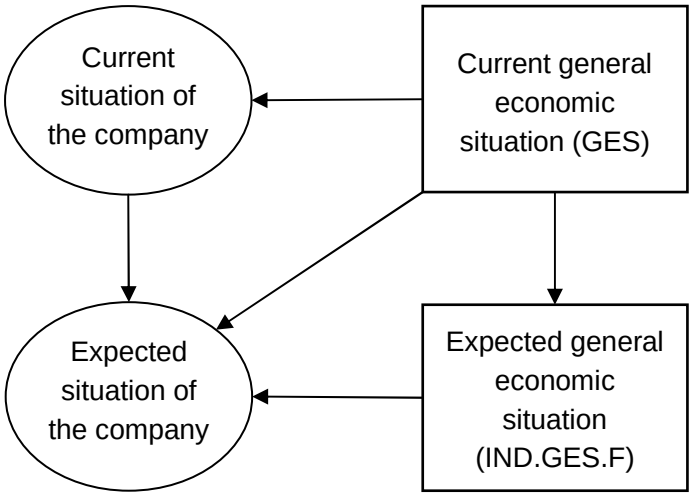

Figure 2. Conceptual model of relations between the assessment of current and future situation both with respect to the situation of the company and to the general economy based on the Survey in the manufacturing sector.

Source: own compilation.

In this conceptual framework, it is assumed that respondent's perception of the current situation of a company influences his/her perception of company's expected situation, his/her perception of the current general economic situation influences perception of the future general economic situation, and finally, his/her perception of the current general economic situation has an impact on the expected economic situation of the company. This conceptual framework is in line with basic stylised facts stating that the future depends on current states and additionally, the general economic situation is affecting the situation at the company level.

3. Modeling strategy

The adopted modeling approach in construction and verification of the final structural model (Figure 2) comprised the following steps.

1. Firstly, based on the measurement model presented in Figure 1, interrelations between variables describing separately states and forecasts were analysed in order to verify existence of the assumed common factor responsible for responses referring to company's situation. The implemented approach was based on the multi-group confirmatory factor analysis (MGCFA). The accuracy of models were based on the descriptive-fit statistics such as Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI). With respect to RMSEA, following Browne & Cudeck (1992), the acceptable range was limited to 0.00-0.08. With respect to CFI and TLI, it was assumed, following Hu and Bentler (1999), that both should be above 0.9 in order to judge the model as acceptable. Additionally, the final solutions were limited to only those in which completely standardised factor loadings were 'salient' (Brown, 2006; Matsunaga, 2011; Osborne & Costello, 2004), which in the case of MGCFA analysis on business tendency survey data was assumed to be above 0.4 (the average in all periods was taken into consideration).

2. Secondly, the confirmatory factor model was extended with answers to the question on general economic situation, and the non-salient indicators of company situation were included in the structural model as independent variables that are explained by the latent factor describing the situation of a company and the general economic situation. Regressions with not significant regression coefficients were eliminated from the analysis.

3. The models of current assessments and expectations were compared to each other and the hypothesis of equal understanding of the structural part of the model between periods was tested. The comparisons were made with chi-square difference testing for WLSMV estimator that is explained in more details in Muthén & Muthén (2012).

4. Finally, a model combining the structural relations of current assessments and expectations was built and tested for intertemporal indifference within the postulated relations between the current assessments and expectations.

In order to reliably compare between periods the means of latent variables of interest, measurement invariance needs to be ascertained. The measurement invariance is verified on three required levels:

a. configural invariance,
b. metric invariance,
c. scalar invariance.

Configural invariance can be described as an equivalence between conceptualization and operationalization of the measured phenomena. It is guaranteed by applying the same indicators, namely the same conceptual model

and operationalization to measurement of each latent variable in each of the groups subject to comparison (cf Davidov, 2008; Kaplan, 2009). For this level of measurement invariance it is required that for measurement models estimated separately for different groups the same pattern of signs of factor loadings is observed in all groups. Metric invariance is intended to show that changes in the latent variable have the same meaning in all groups. This level of measurement invariance is sufficient to analyse correlations between latent variables. Metric invariance is tested by imposing equality constraints between group-specific factor loading matrices and verifying the model fit (Davidov, 2008). Although it is a necessary condition for measurement invariance, it is not sufficient to establish metric invariance in order to compare the values of latent variable between periods. In order to do so, scalar invariance needs to be checked. With this level of measurement invariance the latent variable has not only the same scale in terms of indicator questions but also differences between groups in the thresholds estimated for indicators are not present. This level of measurement is ascertained by holding equal the thresholds for each categorical variable in regressions of indicators on the latent variable (Millsap & Yun-Tein, 2004) and checking whether the model is characterised by sufficient fit.

The procedure of measurement invariance testing might be based on either exact fit tests (increase of the chi-square statistics) or, as in our case, can be based on the close fit statistics (Millsap & Yun-Tein, 2004). In the latter case, the full measurement invariance is tested in one step by checking the model fit with comparative-fit-indices (close fit). In the Mplus 6.1 (Muthén & Muthén, 2012) used in this study this option is the default, and all factor loadings and thresholds are also constrained to be equal by default between groups (periods).

For the structural models of current assessments and expectations the model fit was assessed for different combinations of constraints and the best model was selected based on the chi-square difference testing, which was also used to verify intertemporal stability (existence) of relations between latent constructs.

4. Results

4.1. Current assessment of a company's situation

Initial step of the analysis comprised a multi-group confirmatory factor model with all indicators of company's current assessment included. It was assumed that the question regarding the assessment of the general economic situation (IND.GES.S) is the only one that is unrelated to the current assessment of the situation of the company – the answers to the IND.GES.S question

cannot be conceptually explained by variation in the company's situation. Thus, in the first step a confirmatory model with all remaining variables included (IND.PROD.S, IND.ORD.S, IND.STOCKS.S, IND.PRICES.S, IND.EMPL.S, IND.FS.S, IND.CAP.S) was estimated. The model did have a sufficiently good fit (RMSEA=0.057; CFI=.988; TLI=.990), however two indicators were not salient: IND.STOCKS.S and IND.PRICES.S. Standardised factor loadings for these two indicators were below the threshold value of 0.4. After removing them from the analysis the resulting model remained well fitted (RMSEA=0.057; CFI=.994; TLI=.995) and all the indicators were salient.

Then, the structural model in which not salient indicators were treated as dependent variables was introduced. It implies that the structural model was created by introducing:

- dependence of company's stocks and offered prices on both company's situation and general economic situation;
- regression of current company's situation on the general economic situation, which resulted from the conceptual model presented in Figure 1.

Such a structure was also motivated by the fact that decisions on company's offer prices and company's stocks are rather a consequence of the situation in the company and in the economy than the other way around. The grounds for the first regression were that the economic situation of the general economy should influence the situation of an enterprise.

Structural model was sequentially tested for a possibility to fix the regression coefficients to zero and, when all possibilities to fix to zero failed, it was tested whether they can be fixed equal between periods.[1] The first option relates to no apparent relation between the variables and factors or between the variables, whereas the second implies that the strength of relation between variables or between variables and factors remains constant between the time points. The procedure of direct testing of chi-square differences is not possible with WLSMV estimator and due to this a special testing procedure is employed (Muthén & Muthén, 2012). The following steps of estimation and testing are reported in Table 1.

[1] Fixing a coefficient to zero was reported in tables with '@0', while fixing it equal between periods was reported with '(p1)', '(p2)', etc.

Table 1. Constraints introduced to the structural model of current assessments due to insignificant chi-square test.

Step	Model specification (change)	Chi-square difference test p-value	RMSEA	CFI	TLI
1.	All regression coefficients free to change	n.a.	0.062	0.985	0.983
2.	IND.STOCKS.S on IND.GES.S@0;	0.3422	0.060	0.985	0.984
3.	IND.PRICES.S with IND.STOCKS.s@0;	0.1694	0.059	0.986	0.985

Source: own calculations in Mplus 6.1.

The final model on states assumed no effect of the general economic situation on current stocks and no relation between prices and stocks (Figure 3).

4.2. Expectations of company's situation

The same procedure as regards to the assessment of current states was applied with respect to expectations of companies. In the first step a similar confirmatory model with all variables referring to the expectations of companies (IND.PROD.F, IND.ORD.F, IND.STOCKS.F, IND.PRICES.F, IND.EMPL.F, IND.FS.F, IND.CAP.F) was estimated. The model did have a satisfactory fit (RMSEA=0.053; CFI=.991; TLI=.993), however, similarly to the model of states, the two indicators were not salient: IND.STOCKS.F and IND.PRICES.F. Thus, the two indicators were excluded from the measurement model of the company's situation. The model with the two indicators removed had a similar fit (RMSEA=0.060; CFI=.994; TLI=.996), but all the indicators were salient. Consequently, the structural model was introduced, which initially was of the same form as with respect to the current states.

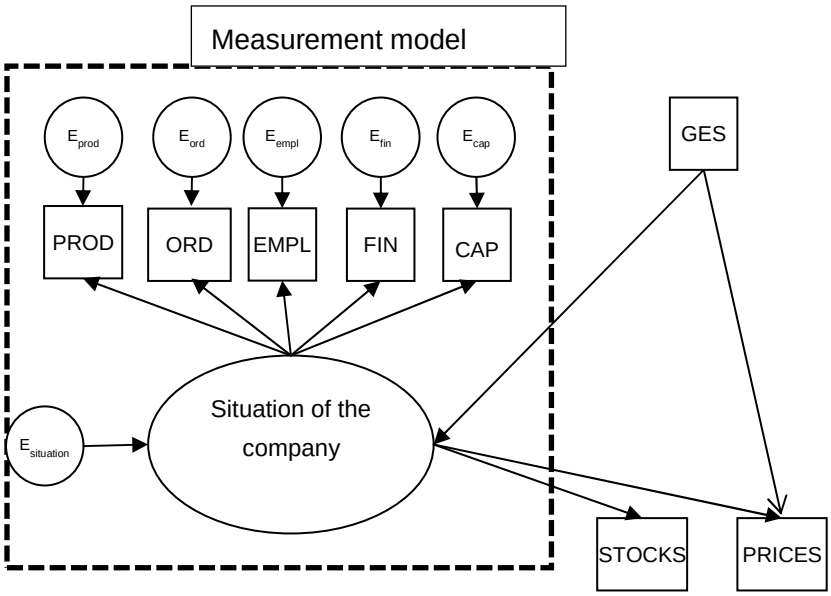

Figure 3. The model of current situation assessments[2].

Source: own compilation.

Structural model was sequentially tested with chi-square difference testing for a possibility to fix the regression coefficients to zero and, when all possibilities to fix it to zero failed, it was tested whether they can be fixed equal between periods. The following steps of the procedure are recorded in Table 2.

The final model on forecasts assumed no relationship between future general economic situation and price decisions but also a lack of influence of the general economic situation on company's decisions on the future level of stocks. However, in the model period-specific relationship between stocks and prices were maintained. The model is presented in Figure 4.

[2] Coding of questions was in line with the State of the Households' questionnaire presented in Appendix 1.

Table 2. Constraints introduced to the structural model of expectations due to insignificant chi-square test.

Step	Model specification (change)	Chi-square difference test p-value	RMSEA	CFI	TLI
1.	All regression coefficients free to change	n.a.	0.063	0.985	0.983
2.	IND.STOCKS.S on IND.GES.S@0;	0.4471	0.061	0.986	0.984
3.	IND.PRICES.S with IND.STOCKS.s@0;	0.3564	0.059	0.986	0.985

Source: own calculations in Mplus 6.1.

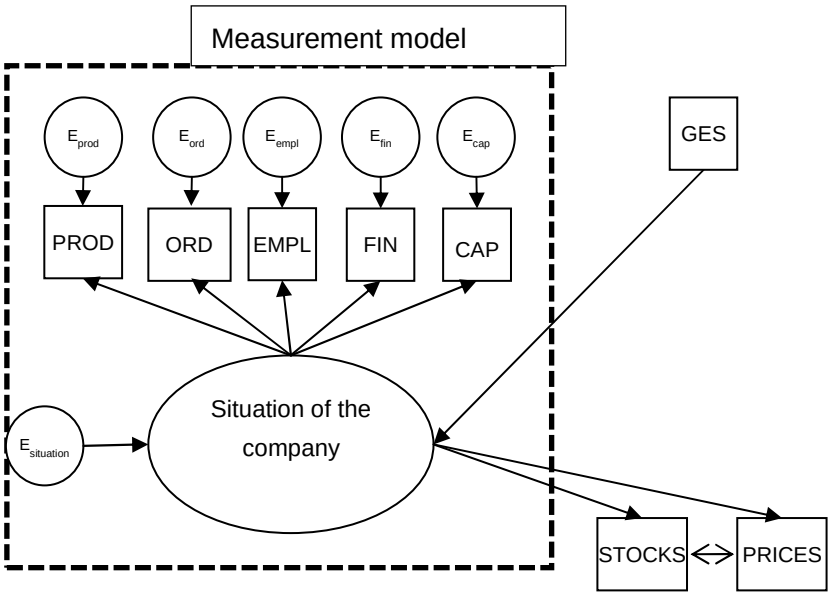

Figure 4. The model of expectations.

Source: own compilation.

4.3. The multi-group (multi-period) structural model with current assessments and expectations combined

The estimated structural model is a combination of both models – referring to the present and to the future (presented in section 4.1 and 4.2). In the first step, it was checked whether current assessments and forecasts can be considered independent, which would imply that companies answer independently the set of questions related to current assessments and the set of questions related to expectations. The model in such specification proved, however, to be very poorly fitted with RMSEA=0.163; CFI=0.765; TLI=0.751. Therefore, it was modified in order to account for all possible influences of current assessments on expectations. As there were additional significant regressions established in the process of estimation of current assessment (see Figure 3) and expectations (see Figure 4) models, the initially proposed structural model for combination of current assessments and expectations (presented in Figure 2) was modified and took the form presented in Figure 5.

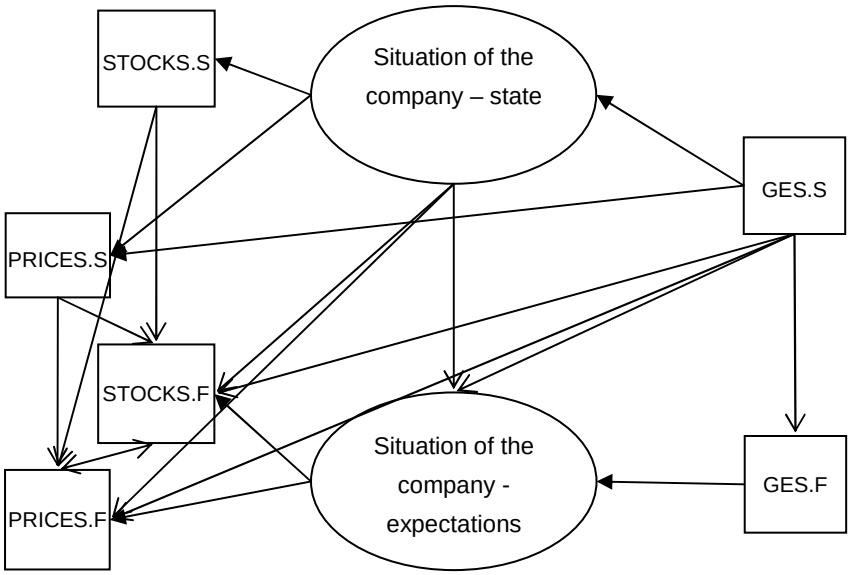

Figure 5. The structural model for current assessments and expectations combined.

Source: own compilation.

The proposed regressions (presented in Figure 5) were sequentially tested to imposed constraints. Similarly to the models of current assessments and expectations, also in the final model the coefficients were initially tested to be equal to zero in all groups (periods) and, if rejected, they were tested to be equal between periods. The results of the stepwise procedure are summarised in Table 3.

Table 3. Constraints introduced to the structural model of current assessment and expectations due to insignificant chi-square test[3]

Step	Model specification (change)	Chi-square difference test p-value	RMSEA	CFI	TLI
1.	All regression coefficients free to change	n.a.	0.076	0.956	0.951
2.	IND.STOCKS.F on Factor_state@0;	0.2778	0.061	0.986	0.984
3.	IND.PRICES.F on IND.GES.S@0;	0.2511	0.075	0.956	0.952
4.	IND.PRICES.F on IND.STOCKS.S@0;	0.0571	0.075	0.957	0.952
5.	IND.STOCKS.F on IND.GES.S@0;	0.0532	0.074	0.957	0.953
6.	Factor_forecast on IND.GES.S (p1);	0.0513	0.074	0.957	0.954
7.	IND.GES.F on IND.GES.S (p2);	0.0857	0.073	0.958	0.955
8.	IND.PRICES.F on Factor_state (p3);	0.1464	0.072	0.958	0.955

Source: own calculations in Mplus 6.1.

[3] Factor_state refers to the factor calculated in 4.1 describing situation of the company – state, while factor_forecast refers to the factor calculated in 4.2 describing situation of the company - forecast.

The final structural model comprised all relationships identified at the level of states and all relationships identified at the level of forecasts but additionally the following relations were established:

- Current company's situation and current general economic situation do not influence predicted changes in the level of stocks;
- Current assessment concerning the general economic situation and current level of stocks of the company are not significant determinants of the future price changes implemented at the company's level;
- Expected company's situation is in all periods equally affected by current assessment of the general economic situation;
- Expected changes in the general economic situation are in all periods (both before and after crisis) equally affected by current assessment of the general economic situation;
- Expected movements of prices of goods vended by a company are in all periods equally affected by current assessment of the general economic situation.

With all these constraints in place, the final model can be presented on the following graph (Figure 6).

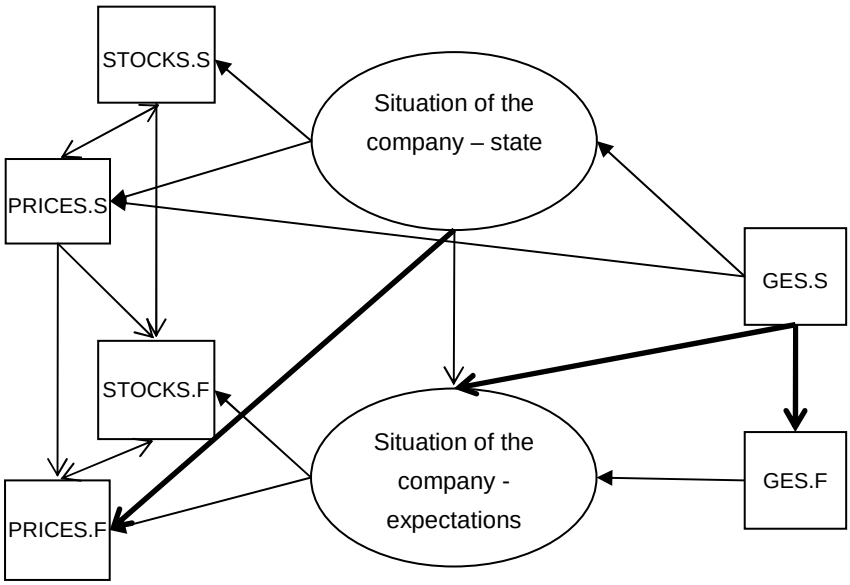

Figure 6. The final structural model for current assessments and expectations combined

Note: period invariant relations were marked with thicker lines.

Source: own compilation.

It can be noticed that questions in the business tendency questionnaire are subject to very specific (and complicated) relations. The most fundamental findings of the paper show that the general economic situation has an influence on situation of the company, however it does not directly influence prices and stocks (with one exception – current general economic situation influences current changes in the company's prices). Current situation of the company has however strong influence on the expectations of company's situation but also on expected price changes. Nevertheless, before final results can be provided on the estimated parameters the final check of equivalence of company's situation concepts was performed.

4.4. Test for equivalence of concepts of company's situation

The full comparability of the company's situation concepts in the area of current assessments and expectations requires the same measurement scale. The set of equality constraints on factor loadings referring to the current assessment of company's situation and expectations of company's situation was tested. Two types of equality constraints were subject to testing. At first it was tested whether the same metric can be applied to both these concepts. The same metric was imposed with equal factor loadings for corresponding items in measurement models (eg IND.CAP.S and IND.CAP.F). The second step was to establish equality of thresholds for the corresponding questions. As described in Section 3, in the first case the correlations can be reliably compared, which implies that the regression coefficients in the structural model can be reliably compared between periods. Only in the second case it would be justified to conduct reliable comparisons between averages of current assessments and expectations. The results are presented in Table 4.

The results support only metric equivalence of the concepts of company's current and expected situation. It implies that the changes in the concept of current company's situation and expected company's situation can be interpreted the same – one point increase in company's current situation equals one point increase in the expected situation. Thus, the regression coefficients involving these two concepts can be compared. Nevertheless, the scalar equivalence was not established, which implies that scales measuring the concepts have different zero points and that one of them is perceived differently than the other. Therefore, although each of these concepts separately possesses the feature of scalar invariance, it is not eligible to assess that company's current and expected situation are measured on the same scale. In order to check for the difference, estimated thresholds in the model with equal factor loadings were compared. They are presented in Table 5.

Table 4. Results of sequential testing for the concept equivalence of company's situation.

Step	Model specification (change)	Chi-square difference test p-value	RMSEA	CFI	TLI
1.	Constraints from the final structural model – factor loadings for current and expected assessment of company's situation allowed to differ	---	0.072	0.958	0.955
2.	Factor loadings equal for current assessment and expectations	0.185	0.072	0.958	0.955
3.	Factor loadings and thresholds fixed equal for current assessments and expectations	0.000	0.077	0.949	0.950

Source: own calculations in Mplus 6.1.

Table 5. Thresholds estimated for the concepts of current company's situation and expected company's situation.

	IND.PROD	IND.ORD	IND.EMPL	IND.FIN	IND.CAP
Current assessment	(-0.761;1.545)	(-0.608;2.776)	(-0.843;1.551)	(-0.855;1.588)	(-0.929;1.539)
Expectations	(-1.609;1.292)	(-2.06;2.417)	(-1.111;1.62)	(-1.22;1.277)	(-1.632;1.482)

Source: own calculations in Mplus 6.1.

In all cases the first threshold is located lower for model of company's situation expectations than for the corresponding model of company's current assessment. In all but one case (IND.EMPL) the second thresholds are also located lower for expectations than for current assessments. Taking into account that the scale for all questions in the business questionnaire is as follows: 1 – better, 2 – the same, 3 – worse, the results imply that it is much easier to score higher with respect to expectations than it is with respect to the states. Thus, it shows that the Polish companies tended to be less pessimistic with respect to the future than with respect to the current assessments.

4.5. Implications for the economy and the new mantra

The estimates of the structural equation model coefficients are presented in Appendix 2, while here a discussion on estimates is conducted.

Current situation of the company has an influence on expectations referring the company's situation. The strength of this relation is however not constant between periods and ranges from as little as 0.4 to as much as 0.9. Current general economic situation has a strong influence on the situation of a company. The strength of this relation seems to be higher after than before the crisis. The same is true for expectations of the general economic situation and expected performance of the firm. There is a negative influence of the current general economic situation on company's expected situation, but the indirect path between the two (GES.F on GES.S and Expected on GES.F) fully compensates for this effect. Thus, the negative regression coefficient implies only that the positive effect is lower than it might be deduced from the indirect path.

There is a very weak impact of current situation of a company on its current stocks. Prices, however, are influenced very moderately but positively by current situation – the better the situation, the more room for price increases. Current prices are also positively related to the current general economic situation. Stocks, although very weakly related to other variables, tend to be considerably related in time – current level of stocks strongly influences their expected level. The same is true with prices. Their expected changes are strongly driven by current changes. It is also the case that expected performance of the economy (general economic situation) strongly depends on current micro-level assessment.

As far as the co-movement of stocks and prices is examined, in most periods higher prices led to the above-normal level of stocks. It seems to be against the stylised facts and indicates that companies are not independent in their decisions. In regular situation one should expect that higher level of stocks would imply lower level of prices, as firms would be willing to sell their additional stocks. Nevertheless, it is possible that companies behave countercyclical and reduce their stocks in line with prices thus increasing the amplitude of business cycle fluctuations.

Based on all the conclusions drawn in Section 4 it is possible to formulate a mantra in business tendency surveys. If it is limited to the most important conclusions from the analysis it might sound in a positive version: 'If it gets better in the economy, it gets even better for me and I have a chance to increase my prices, it will also get better tomorrow, but not as much as today." And in the negative one: "If it gets worse in the economy, it gets even worse for me

and I have to reduce my prices, it will also get worse tomorrow, but not as much as today.'

5. Conclusions

This paper starts a discussion on a way in which responses to business survey questionnaire in the manufacturing sector are formed. It is only a preliminary analysis, as the analysis should be further extended into a panel-type study. With multi-group (multiperiod) analysis we were however able to show the following.

1. There is a concept of company's situation which is manifested in five questions. Thus, a large part of the information from survey responses to the questionnaire might be reduced to a single variable.
2. The same questions are used to define the concept of company's situation with respect to the current assessments and expectations.
3. Each of the concepts was tested for full measurement invariance and passed the test, which means that the values of current company's situation are comparable between periods and the values of expected company's situation are also comparable between periods.
4. There is additionally metric equivalence of concepts regarding current assessments and expectations of company's situation, which implies that their interrelation can be reliably measured.
5. Most interactions between the latent concepts and other questions from the questionnaire are in line with the stylised facts.

Interrelations between the general economic situation and the current situation of company are strong, while prices and stocks are loosely related to the concepts of company's situation and general economic situation.

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Appendix 1. Set of questions with answers in the standardised questionnaire in the manufacturing industry

Question number and code	Question wording	Answer categories (representing also scale points)
Q1_S (IND.PROD.S)	Your production over the past month has...	+ increased = remained unchanged - decreased
Q1_F (IND.PROD.F)	Your production in the forthcoming 3-4 months...	+ will increase = won't change - will decrease
Q2_S (IND.ORD.S)	Your order books over the past month have been...	+ above normal = normal - below normal
Q2_F (IND.ORD.F)	Your order books in the forthcoming 3-4 months will be…	+ above normal = normal - below normal
Q3_S (IND.EX.ORD.S)	Your exports order books over the past month have been...	+ above normal = normal - below normal ? not applicable
Q3_F (IND.EX.ORD.F)	Your exports order books in the forthcoming 3-4 months will be…	+ above normal = normal - below normal ? not applicable
Q4_S (IND.STOCKS.S)	Your stocks over the past month have been...	+ above normal = normal - below normal
Q4_F (IND.STOCKS.F)	Your stocks in the forthcoming 3-4 months will be…	+ above normal = normal - below normal
Q5_S (IND.PRICES.S)	Your selling prices over the past month has...	+ increased = remained unchanged - decreased
Q5_F (IND.PRICES.F)	Your selling prices in the forthcoming 3-4 months...	+ will increase = won't change - will decrease
Q6_S (IND.EMPL.S)	Your firm's total employment over the past month has...	+ increased = remained unchanged - decreased
Q6_F (IND.EMPL.F)	Your firm's total employment in the forthcoming 3-4 months...	+ will increase = won't change - will decrease

Q7_S (IND.FS.S)	Your financial situation over the past month has...	+ improved = remained unchanged - deteriorated
Q7_F (IND.FS.F)	Your financial situation in the forthcoming 3-4 months...	+ will improve = won't change - will deteriorate
Q8_S (IND.GES.S)	The general economic situation (irrespectively of the situation of your branch and company) over the past month has...	+ improved = remained unchanged - deteriorated
Q8_F (IND.GES.F)	The general economic situation (irrespectively of the situation of your branch and company) in the forthcoming 3-4 months...	+ will improve = won't change - will deteriorate
Q9_S (IND.CAP.S)	Your capacity utilization over the past month has...	+ increased = remained unchanged - decreased
Q9_F (IND.CAP.F)	Your capacity utilization in the forthcoming 3-4 months...	+ will increase = won't change - will decrease

Source: *European Economy* (2006); *Survey in the Manufacturing Sector*, Research Institute for Economic Development, Warsaw School of Economics.

Appendix 2. The coefficients in the final structural model

	Expected on Current	Current on GES.S	Expected on GES.F	Expected on GES.S	STOCKS.S on Current	PRICES.S on Current	STOCKS.F on Expected	PRICES.F on Expected	PRICES.F on Current	PRICES.S on GES.S	STOCKS.F on STOCKS.S	STOCKS.F on PRICES.S	PRICES.F on PRICES.S	GES.F on GES.S	PRICES.F with STOCKS.F
2005Q1	0.635	0.856	1.263	-0.576	0.008	0.196	0.042	0.144	-0.128	0.06	0.81	-0.173	0.697	0.662	0.124
2005Q2	0.792	0.927	0.961	-0.576	0.025	0.176	0.068	0.312	-0.128	0.266	0.85	0.053	0.691	0.662	-0.173
2005Q3	0.595	1.272	1.059	-0.576	-0.013	0.145	0.058	0.286	-0.128	0.235	0.749	-0.218	0.91	0.662	0.118
2005Q4	0.652	1.147	1.364	-0.576	-0.02	0.233	0.054	0.201	-0.128	0.208	0.773	-0.092	0.574	0.662	0.194
2006Q1	0.633	1.136	1.042	-0.576	0.065	0.13	0.112	0.186	-0.128	0.081	0.753	0.108	0.73	0.662	0.251
2006Q2	0.745	0.844	0.899	-0.576	0.055	0.181	0.059	0.215	-0.128	-0.206	0.609	-0.038	0.721	0.662	0.103
2006Q3	0.718	1.045	0.768	-0.576	0.086	0.204	0.076	0.226	-0.128	0.254	1.218	0.116	1.088	0.662	-0.126
2006Q4	0.661	0.79	1.135	-0.576	0.047	0.196	0.063	0.275	-0.128	0.043	0.735	-0.092	0.49	0.662	0.252
2007Q1	0.671	0.809	1.259	-0.576	0.06	0.107	0.045	0.239	-0.128	0.046	0.964	-0.119	0.446	0.662	0.121
2007Q2	0.944	0.885	0.931	-0.576	-0.048	0.295	0.156	0.191	-0.128	0.11	0.8	-0.317	0.537	0.662	0.01
2007Q3	0.414	0.947	1.174	-0.576	-0.054	0.211	0.128	0.259	-0.128	-0.104	1.229	-0.014	0.576	0.662	0.174
2007Q4	0.854	0.783	1.262	-0.576	0.022	0.192	-0.018	0.141	-0.128	0.139	1.005	0.221	0.991	0.662	-0.04
2008Q1	0.664	0.631	1.07	-0.576	0.098	0.289	0.083	0.207	-0.128	0.003	0.755	-0.104	0.458	0.662	0.195
2008Q2	0.923	0.946	1.285	-0.576	-0.008	0.146	0.001	0.227	-0.128	0.063	0.962	-0.087	0.635	0.662	0.104
2008Q3	0.816	1.133	1.371	-0.576	0.026	0.193	-0.088	0.168	-0.128	-0.085	0.772	0	0.97	0.662	0.178
2008Q4	0.816	1.058	1.37	-0.576	-0.031	0.153	0.085	0.254	-0.128	0.019	1.253	0.076	0.808	0.662	-0.045
2009Q1	0.724	1.075	1.592	-0.576	-0.009	0.273	0.171	0.253	-0.128	-0.101	1.152	-0.159	0.784	0.662	0.015
2009Q2	0.785	1.015	1.445	-0.576	0.013	0.144	0.102	0.282	-0.128	-0.087	1.082	-0.061	1.128	0.662	0.322
2009Q3	0.822	1.107	1.394	-0.576	0.067	0.139	0.084	0.21	-0.128	-0.043	1.069	-0.071	1.149	0.662	-0.028
2009Q4	0.777	1.089	1.221	-0.576	0.039	0.203	-0.024	0.292	-0.128	-0.007	1.21	-0.086	0.839	0.662	0.167
2010Q1	0.729	1.365	1.603	-0.576	0.093	0.232	0.095	0.297	-0.128	-0.122	1.12	-0.046	0.738	0.662	0.209
2010Q2	0.743	1.377	1.442	-0.576	0.105	0.112	0.041	0.23	-0.128	0.174	1.093	0.182	0.669	0.662	0.118
2010Q3	0.649	1.358	1.425	-0.576	0.056	0.158	0.073	0.233	-0.128	0.022	0.868	0.015	0.702	0.662	-0.007
2010Q4	0.909	1.192	0.966	-0.576	0.034	0.109	0.066	0.18	-0.128	0.022	1.296	0.184	0.961	0.662	-0.272
2011Q1	0.861	1.187	1.332	-0.576	0.154	0.089	0.079	0.134	-0.128	0.017	1.001	-0.194	0.816	0.662	0.191
2011Q2	0.668	1.183	1.365	-0.576	0.086	0.129	-0.001	0.175	-0.128	-0.242	0.773	0.019	0.69	0.662	0.036
2011Q3	0.634	1.337	0.942	-0.576	0.096	0.032	-0.045	0.168	-0.128	0.275	0.884	-0.045	0.603	0.662	-0.04
2011Q4	0.74	1.386	1.169	-0.576	0.07	0.162	0.079	0.178	-0.128	0.035	1.019	-0.039	0.69	0.662	-0.035
2012Q1	0.698	1.09	1.241	-0.576	0.02	0.154	0.055	0.195	-0.128	-0.169	0.833	-0.121	0.802	0.662	-0.115
2012Q2	0.783	1.081	1.274	-0.576	0.175	0.111	0.019	0.134	-0.128	0.032	0.944	0.049	1.093	0.662	0.224
2012Q3	0.847	1.237	1.186	-0.576	0.077	0.132	0.092	0.233	-0.128	0.087	1.114	-0.103	0.727	0.662	-0.019
2012Q4	0.87	1.26	1.172	-0.576	0.079	0.174	0.121	0.189	-0.128	0.028	1.152	-0.048	0.878	0.662	0.085
2013Q1	0.662	1.493	1.347	-0.576	0.099	0.255	0.105	0.221	-0.128	-0.029	1.126	-0.182	0.745	0.662	0.156

Note: 'expected' refers to the concept of expected company's situation and 'current' refers to the concept of current company's situation.