DO SURVEY RESPONSES IN MANUFACTURING FLUCTUATE WITH BUSINESS CYCLE? EVIDENCE FROM POLAND

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Abstract

As we are entering a post-SARS-CoV-2 slump in the economic activity, up-to-date analysis of the dynamics of economic phenomena during expansion and contraction phases of business cycles poses a very current and very important research problem for applied economists. In this paper, literature on dating Polish business cycles is briefly summarised, chronology of expansion and contraction phases is proposed on the basis of turning points established in previous research, and statistical properties of observed and expected changes in 8 fields of economic activity are presented and interpreted.

It is found that during contraction phases, absolute values of balance statistics are both lower, as measured by mean and median, and less volatile, as measured by standard deviation, than during expansion phases. This finding suggests that, in hard times, enterprises are less likely to form opinions or expectations much different from the consensus. As far as the depth of the downturns is concerned, the contractions associated with the financial crisis of 2008–2009 and the second half of 2012 appear worse, both with respect to observed and expected changes, than the slowdown of 2000–2002. Generally, excessive volatility (high-standard deviations, as compared to measures of central tendency) is noted in expansion phases, more often for observed changes than in the case of forecasts. Lower uncertainty is visible in contraction phases, particularly the one associated with the financial crisis of 2008–2009.

The results presented in this paper allow to suggest that the observed and expected balance statistics of survey responses exhibit different statistical properties depending on the phase of the business cycle. This finding could assist future research concerning the impact of the SARS-CoV-2 virus on the dynamics of economic activity.

Keywords: business cycles, survey data, expectations, non-response, manufacturing industry.

JEL codes: C10, C83, D84, E32, L60.

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Introduction

Now it is more true than ever: we are going through turbulent times. Consequences of the incoming (or, by the time you are reading this, current) post-SARS-CoV-2 crisis are difficult to evaluate at present, but they will surely change our economic environment for months or years. Adequate analysis regarding the dynamics of economic phenomena during expansion and contraction phases of business cycles will constitute a crucial part of macro-economic studies in the future.

The purpose of this paper is to identify turning points in Polish business cycles on the basis of published findings, and to analyse statistical properties of responses provided by respondents of the RIED (Research Institute for Economic Development of SGH Warsaw School of Economics) business tendency surveys. Since we are very possibly on the verge of a crisis, separate analysis of the responses, as the economy expanded and contracted in the past, may provide valuable insight as to behaviour of economic variables in the near future.

Expectations of economic agents have been included in this analysis for an important reason. Cyclical behaviour of macro-economic time series is now better—but still imperfectly—understood, and there is no doubt among the economists that psychological characteristics of the markets, including expectations of market participants, play an important part in shaping the business cycles. Expectations defined as credible forecasts—that is, forecasts reliable enough to constitute the basis for actions of economic agents (see Tomczyk, 2011)—influence decisions concerning, among others, levels of investment and pricing as well as employment policy of enterprises, as well as consumption decisions and labour supply of households. Therefore, expectations should be included in the analysis of business cycles, just as surely as observed behaviour of economic variables.

The paper is organised as follows. In section 1, literature on recording Polish business cycles is briefly summarised, and a chronology of expansion and contraction phases is offered on the basis of these findings. In section 2, the RIED database pertaining to business tendency surveys in manufacturing is described, and descriptive statistics of observed and expected changes in 8 fields of economic activity are presented and interpreted. Comments and conclusions follow in the last section.

1. Review of literature on the chronology of Polish business cycles

There is no need to elaborate on the importance of identifying business cycles for the purposes of understanding macro-economic dynamics. Dating back to the seminal 1946 book by Burns and Mitchell, economists generally agree that cycles

constitute a crucial input in the behaviour of economic variables. While relevance of business cycles for macro-economic analysis has been widely accepted, the definition of a cycle remains imprecise; economists do not agree on the length of the cycle itself or with regard to its individual phases, naming of the business cycle components, definitions of turning points, etc. Since the aim of this paper is neither to propose a new chronology of business cycles nor to introduce an updated definition of a cycle, these nuances will not be debated here. However, discussions of various definitions of business cycles, methods of identifying and dating the specific components, amplitudes of cycles in distinct sectors of the economy, analysing the cause-and-effect relationships within cycles etc., are extensively presented in the literature (for a recent definitive Polish publication, see Drozdowicz-Bieć 2012; for a handbook of business cycle analysis on the basis of survey data, see Goldrian 2007). For the purposes of this paper, business cycle is understood in its classical meaning introduced by Burns and Mitchell (1946, p. 5):

> Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximating their own.

Analysis of business cycles has constituted an important branch of Polish macro-economic studies since the early 1990s. As a result, there are numerous publications concerning the dynamics, chronology, implications for economic policy, and other features of Polish business cycles. Needless to say, there is no agreement between the authors of the dating of business cycles in Poland. Depending on the period taken into consideration, the general approach to cycle analysis (classical or modern; see Krolzig & Toro, 2004), formal econometric and statistic methods used to model the cycles (spectral analysis or nonlinear time series modeling, including Markov switching models; see Oppenländer & Poser, 2018; Jaworski, 2015), statistical filters applied, level of aggregation of the data etc., they found different dating schemes for the business cycles in Polish economy.

In Table A in the Appendix, a summary is provided regarding the results obtained in the most influential papers on business cycle dating in Poland after 1997. It is clear that authors differ in their chronology of expansion and contraction phases (which, for the purpose of this paper, I define as the period from the lower turning point until the upper turning point, and from the upper turning point to the lower turning point, respectively). Cycles vary in length from 2 to 18 quarters, as determined on the basis of turning points, and the turning points themselves are

identified in different quarters by individual authors. However, a basic consensus emerges. The following expansion phases seem to have been identified by most researchers:

- Q3 2002—Q2 2004;
- Q2 2005—Q1 2008;
- Q4 2009—Q2 2011;
- Q1 2013—Q1 2020.

Also, the analysts appear to agree on the following contraction phases:

- Q2 2000—Q3 2002;
- Q1 2008—Q4 2009;
- Q2 2011—Q1 2013.

Data prior to April 2000 have been omitted from the subsequent analysis, as the authors do not concur on the details of business cycle dating. The period from July 2004 to March 2005 has been excluded for the same reason: there is no agreement on whether it should be classified as time of expansion or contraction. However, 4 expansion phases (with the total number of 177 monthly observations) and 3 contraction phases (with 51 monthly observations) remain available for the purpose of statistical analysis in the next section.

2. Results of empirical analysis

Since March 1997, the Research Institute for Economic Development of SGH Warsaw School of Economics (henceforth RIED), has conducted monthly business tendency surveys in manufacturing. The scope of the survey and variants of the answers are presented in Table B in the Appendix. Eight fields of economic activity are evaluated by the respondents with respect to changes they observe and expect for the next 3–4 months. On the basis of individual qualitative responses, balance statistics (that is, differences between the number of optimists—those who report or expect improvement—and pessimists), are calculated and presented in percentage points.

For the reasons explained in section 2, the starting point of the analysis is April 2000. The ending point is established for December 2019 to avoid the onset of the—very probable—post-SARS-CoV-2 crisis. In February and March of 2020, the first signs of deterioration concerning the macro-economic situation have already been visible, but the full analysis of the post-SARS-CoV-2 slowdown has to be postponed until the current phase of the business cycle ends.

In Table C in the Appendix, averages, medians and standard deviations for both observed and expected changes in balance statistics for 8 fields of economic

activity surveyed by RIED are presented, aggregated into expansion and contraction phases. It is clear that forecasts are typically more optimistic than observed changes, with 2 exceptions: question No. 04 (stocks of finished goods) and No. 06 (level of employment). This result is consistent with previous findings that expectations expressed in Polish business tendency surveys in industry are not unbiased or efficient with respect to available information, and hence, not Muth-rational (see Tomczyk, 2011). Excessive optimism remains a persistent—and, to my best knowledge, unexplained—feature of expectations cocnerning Polish industrial enterprises.

During contraction phases, absolute values of balance statistics are both lower, as measured by mean and median, and less volatile, as measured by standard deviation, than during expansion phases—again, with a single exception (question No. 05—prices). This finding suggests that there are few disagreements between the respondents as to the current or future course of the economy, and little uncertainty, with economy being "on the rocks". The lowest variation is observed in contraction phases for questions No. 06 (employment) and 08 (general situation of the economy). It appears that in these 2 fields of economic activity, respondents are the most congruent. Also in these 2 fields, for both observed and forecasted changes, high and highly negative balance statistics are noted, which imply that there is visible dominance of the pessimists over the optimists.

On the other hand, there is more volatility (as expressed by very high standard deviation as compared to measures of central tendency) during expansion phases for all the fields of economic activity analysed.

Still, there is only a limited use of statistics aggregated over the entire combined periods of expansion or contraction during the 2 decades of 2000–2019. To broaden the investigation, results broken down into 3 contraction phases and 4 expansion phases identified on the basis of the Polish literature on business cycles are presented in Table D. It seems that the contraction associated with the financial crisis (2008.04–2009.09) and the short downturn in the second half of 2012 (2012.07–2012.12) are deeper, both with respect to observed and expected changes, than the contraction of 2000.04–2002.06, with the sole exception of question No. 06 (unemployment), where the contraction of 2000-2002 seemed to make respondents the most pessimistic. Mixed results are obtained for questions No. 07 (financial standing of a company) and 08 (general business conditions).

For all business cycle phases, low absolute values for the average and median, suggesting lack of consensus or heavy fraction of "no change" responses, are noted in questions No. 04 (stocks of finished goods) and 05 (prices of goods produced). High absolute values of averages and medians, signifying consensus among the respondents, are visible for observed changes in questions No. 02 (level of orders) and 03 (level of export orders); it is clear, however, that a similar consensus does not extend to expectations. High absolute values of measures regarding central

tendency are discernible for both observed and expected changes in questions No. 06 (employment) and 08 (general business conditions). These results further suggest that when evaluating or forecasting employment and general standing of the economy, respondents tend to flock in one particular direction more easily that when asked about other aspects of their economic activity.

Only in a few cases is there a significant difference between the average and median, which may suggest that more of the data values are clustered towards one end of their range or a few extreme values are observed. This happens in expansion and contraction phases, and for observed and forecasted changes, there seems to be no clear pattern of incidence of extreme values with regard to balance statistics.

Generally, more volatility (high standard deviations, as compared to measures of central tendency) is noted during expansion phases, more often for observed changes than for forecasts. Lower uncertainty is visible in contraction phases, particularly the one associated with financial crisis of 2008–2009. Volatility seems generally lower for questions No. 06 (employment), 07 (financial standing) and 08 (general situation of the economy) than for the remaining aspects of economic activities; this finding points to the conclusion that the last 3 questions in the RIED survey are subject to the highest consensus among all the fields of manufacturing industry characteristics included in the questionnaire.

As the final stage of the empirical analysis, an attempt has been made to analyse response rates during expansion and contraction phases. The numbers of questionnaires sent and returned are available in the RIED database from January 2008,[1] and analysed from the beginning of the contraction of 2008.04. The average response rate for expansion phases is calculated at 25.28%, and for contraction phases –32.69%. Although not conclusive, this result suggests that during difficult times, the respondents are more willing to take part in a survey, perhaps in hopes of obtaining government assistance.

Conclusions

There are several general conclusions that may be drawn from breaking down the observations and expectations of the RIED manufacturing industry survey respondents into sub-periods, corresponding to expansions and contractions of the economy.

During contraction phases, absolute values of balance statistics are both lower, as measured by mean and median, and less volatile, as measured by standard deviation, than during expansion phases. This finding allows to suggest that in hard times, enterprises are less likely to form opinions or expectations much different

[1] There are 2 observations missing: for May 2010 and October 2014.

from the consensus. Also, when evaluating or forecasting employment and the general standing of the economy, respondents tend to remain in agreement to a higher degree than when asked to evaluate or forecast other aspects of their economic activity. As far as depth of the downturns is concerned, the contractions associated with the financial crisis of 2008–2009 and the second half of 2012 appear worse, both with respect to observed and expected changes, than the slowdown of 2000–2002. Generally, excessive volatility (high standard deviations, as compared to measures of central tendency) is noted during expansion phases, more often for observed changes than forecasts. Lower uncertainty is visible in contraction phases, particularly the one associated with financial crisis of 2008–2009.

Unfortunately, the time series available are excessively limited—and separate phases of business cycles too short—to extend statistical analysis to, for example, properties of expectations expressed in various phases of business cycles, rationality of expectations with respect to the cycle phase, or correlation of sentiments expressed in tendency surveys with other aggregated measures of economic activity during upturns and downturns. Still, the results presented in this paper seem promising for establishing that basic statistical properties of observed and expected balance statistics differ in periods of good and bad times. This finding could assist future research on the impact of the SARS-CoV-2 virus concerning the dynamics of economic activity.

To conclude, I would like to re-address the importance of expectations in explaining, modelling, and forecasting the course of economic business cycles. Modern economists generally agree that business cycles are more likely to reflect endogenous mechanisms rather than to simply respond to exogenous shocks (see Beaudry, Galizia, & Portier, 2020). Therefore, the inclusion of expectations—defined as forecasts reliable enough to constitute the basis for current decisions of economic agents—remains a crucial component of reliable business cycle analysis.

Appendix

Table A. Summary of business cycle dating in Poland (quarters)

Author(s)	Expansion phases	Contraction phases
Fic (2009) method: Markov switching models		Q1 1997—Q1 1999
	Q1 1999—Q1 2000	
		Q1 2000—Q1 2002
	Q1 2002—Q2 2004	
		Q2 2004—Q2 2005
	from Q2 2005	
Gradzewicz, Growiec, Hagemeier and Popowski (2010) method: Christiano-Fizgerald filter & other spectral analysis techniques		Q1 1998—Q4 1998
	Q4 1998—Q1 2000	
		Q1 2000—Q4 2002
	Q4 2002—Q1 2004	
		Q1 2004—Q2 2005
	Q2 2005—Q1 2008	
		from Q1 2008
Drozdowicz-Bieć (2012) method: Bry-Boschan procedure		Q1 1998—Q1 2002
	Q1 2002—Q1 2008	
		Q1 2008—Q1 2009
	from Q1 2009	
Adamowicz, Dudek, Pachucki and Walczyk (2012) method: Christiano-Fizgerald filter & Bry-Boschan procedure		Q1 1998—Q1 1999
	Q1 1999—Q1 2000	
		Q1 2000—Q3 2002
	Q3 2002—Q2 2004	
		Q2 2004—Q2 2005
	Q2 2005—Q1 2008	
		Q1 2008—Q4 2009
	from Q4 2009	
Skrzypczyńska (2013) method: Markov switching models & frequency filters	Q3 1997—Q1 1998	
		Q1 1998—Q3 1999
	Q3 1999—Q2 2000	
		Q2 2000—Q3 2003
	Q3 2003—Q2 2004	
		Q2 2004—Q4 2005
	Q4 2005—Q3 2008	
		Q3 2008—Q4 2011
	from Q4 2011	
Warżała (2014) method: Hodrick-Prescott filter & Bry-Boschan procedure		Q1 1997—Q3 1998
	Q3 1998—Q4 1999	
		Q4 1999—Q3 2001
	Q3 2001—Q4 2003	
		Q4 2003—Q1 2005
	Q1 2005—Q4 2007	
		Q4 2007—Q1 2009
	Q1 2009—Q4 2010	
		from Q4 2010

Table A - cont.

Author(s)	Expansion phases	Contraction phases
Ulrichs, Błażej and Jędrych (2014) method: Christiano-Fizgerald filter & Bry-Boschan procedure		Q2 2000—Q3 2002
	Q3 2002—Q1 2004	
		Q1 2004—Q2 2005
	Q2 2005—Q3 2007	
		Q3 2007—Q2 2009
	Q2 2009—Q2 2011	
		Q2 2011—Q1 2013
	from Q1 2013	
Pawęta (2017) method: Bry-Boschan procedure	Q4 1996—Q4 1997	
		Q4 1997—Q4 1998
	Q4 1998—Q4 1999	
		Q4 1999—Q1 2002
	Q1 2002—Q1 2004	
		Q1 2004—Q2 2005
	Q2 2005—Q1 2007	
		Q1 2007—Q4 2008
	Q4 2008—Q3 2011	
		Q3 2011—Q4 2012
	Q4 2012—Q4 2015	
		Q4 2015—Q3 2016
	from Q3 2016	
Adamowicz and Walczyk (2018) method: Christiano-Fizgerald filter	Q3 1996—Q1 1998	
		Q1 1998—Q4 1998
	Q4 1998—Q3 2000	
		Q3 2000—Q4 2004
	Q4 2004—Q4 2007	
		Q4 2007—Q3 2009
	Q3 2009—Q2 2011	
		Q2 2011—Q3 2013
	from Q3 2013	

Source: Authors mentioned in the Table. If there is more than 1 cycle component analysed in a paper, the element with the highest level of aggregation is presented. I would like to thank Ms. Agata Szaniec for her assistance during tge early stages of research on Polish business cycle chronology.

Table B. Monthly RIED questionnaire in the manufacturing industry

		Observed within the last month	Expected for the next 3–4 months
q01	Level of production (value or physical units)	up	will increase
		unchanged	will remain unchanged
		down	will decrease
q02	Level of orders	up	will increase
		normal	will remain normal
		down	will decrease

Table B – cont.

		Observed within the last month	Expected for the next 3–4 months
q03	Level of export orders	up	will increase
		normal	will remain normal
		down	will decrease
		not applicable	not applicable
q04	Stocks of finished goods	up	will increase
		unchanged	will remain unchanged
		down	will decrease
q05	Prices of goods produced	up	will increase
		unchanged	will remain unchanged
		down	will decrease
q06	Level of employment	up	will increase
		unchanged	will remain unchanged
		down	will decrease
q07	Financial standing	improved	will improve
		unchanged	will remain unchanged
		deteriorated	will deteriorate
q08	General situation of the economy regardless of situation in your sector and enterprise	improved	will improve
		unchanged	will remain unchanged
		deteriorated	will deteriorate

Source: RIED database.

Table C. Descriptive statistics for observed and expected balance statistics; expansion and contraction phases aggregated

		exp $n = 177$	cont $n = 51$
q01-obs	avg	3.37	–9.74
	med	3.10	–8.10
	dev	10.91	12.63
q01-for	avg	8.83	1.91
	med	9.10	8.00
	dev	11.63	15.13
q02-obs	avg	–6.76	–23.85
	med	–7.40	–22.20
	dev	11.68	13.03
q02-for	avg	–0.08	–9.90
	med	–0.20	–6.00
	dev	11.66	15.23
q03-obs	avg	–9.26	–23.22
	med	–10.00	–21.30
	dev	10.18	13.70

Table C – cont.

		exp ***n* = 177**	**cont** ***n* = 51**
q03-for	avg	–3.00	–12.64
	med	–3.00	–8.30
	dev	10.72	18.08
q04-obs	avg	–0.01	3.32
	med	–0.20	3.20
	dev	3.87	4.00
q04-for	avg	–3.79	–2.52
	med	–3.90	0.77
	dev	2.84	3.27
q05-obs	avg	2.63	–2.03
	med	1.80	–4.40
	dev	9.03	8.67
q05-for	avg	6.20	2.78
	med	4.70	0.30
	dev	8.90	8.04
q06-obs	avg	–4.41	–25.65
	med	–2.90	–27.70
	dev	8.13	10.45
q06-for	avg	–6.73	–31.04
	med	–5.70	–35.60
	dev	9.35	11.40
q07-obs	avg	–5.81	–22.75
	med	–7.40	–21.20
	dev	8.45	9.44
q07-for	avg	–1.91	–11.54
	med	–3.30	–11.50
	dev	9.57	10.60
q08-obs	avg	–10.52	–49.40
	med	–10.90	–41.70
	dev	18.14	18.62
q08-for	avg	–11.42	–40.37
	med	–11.40	–41.70
	dev	15.81	16.70

Notation: see Table B; cont—contraction phase, exp—expansion phase, obs—observed changes, for—forecasted (expected) changes; avg—average, med—median, dev—standard deviation.
Source: Own work.

Table D. Descriptive statistics for observed and expected balance statistics; broken down into expansion and contraction phases

		cont 2000.04—2002.06	exp 2002.07—2004.06	exp 2005.04—2008.03	cont 2008.04—2009.09	exp 2009.10—2012.06	cont 2012.07—2012.12	exp 2013.01—2019.12
q01-obs	avg	–6.70	6.70	10.09	–14.39	2.97	–9.47	–0.30
	med	–7.40	7.25	11.30	–9.60	2.40	–6.20	0.50
	dev	10.28	11.16	10.69	15.60	11.58	9.47	9.04
q01-for	avg	8.74	12.03	19.16	–3.82	6.33	–11.67	3.41
	med	10.30	15.90	20.30	–6.50	9.70	–12.40	5.50
	dev	10.30	8.97	10.84	17.71	11.40	9.02	9.16
q02-obs	avg	–21.29	–4.83	3.04	–28.63	–9.59	–21.00	–10.39
	med	–21.40	–4.30	3.10	–25.65	–10.50	–20.85	–8.90
	dev	11.07	11.46	11.64	16.07	11.49	7.51	9.25
q02-for	avg	–3.26	2.91	12.46	–16.21	–3.74	–20.83	–4.87
	med	–4.00	4.75	13.50	–19.75	–0.50	–20.90	–2.20
	dev	9.39	8.49	10.92	19.34	11.22	8.01	8.38
q03-obs	avg	–15.65	–1.68	–0.55	–35.13	–13.50	–21.53	–13.50
	med	–16.80	–2.35	0.50	–38.70	–12.10	–22.40	–12.95
	dev	8.41	6.94	8.74	13.85	9.98	5.79	7.80
q03-for	avg	–2.89	5.28	8.90	–24.54	–8.62	–20.80	–8.26
	med	–2.60	6.85	9.10	–27.90	–6.20	–21.75	–7.70
	dev	7.12	7.43	6.72	15.80	10.23	7.74	6.86
q04-obs	avg	3.68	–0.03	–1.46	3.68	0.37	0.63	0.47
	med	3.30	–0.15	–2.15	4.85	–0.20	0.65	0.80
	dev	4.10	4.99	4.43	4.16	3.60	2.01	3.22
q04-for	avg	–0.97	–2.59	–3.78	–4.12	–3.98	–4.45	–4.07
	med	–0.60	–3.35	–4.25	–3.75	–3.80	–4.35	–3.80
	dev	2.92	3.08	2.99	2.49	2.74	3.70	2.70
q05-obs	avg	–1.64	–0.60	4.52	–2.12	7.10	–3.45	1.00
	med	–3.40	–3.45	6.70	–4.95	6.60	–4.35	–2.45
	dev	9.71	8.45	9.58	8.54	9.53	3.30	8.01
q05-for	avg	5.27	3.59	8.88	0.22	8.48	–0.77	4.90
	med	1.90	0.85	11.50	–1.70	8.40	–1.30	2.30
	dev	8.80	6.48	8.88	7.00	7.80	2.43	9.53
q06-obs	avg	–30.54	–15.24	–1.06	–22.58	–8.09	–12.80	–1.30
	med	–29.20	–16.70	1.15	–24.45	–6.90	–11.45	0.10
	dev	7.20	6.70	6.46	11.41	6.55	4.36	6.31
q06-for	avg	–38.13	–20.05	–1.61	–23.59	–12.55	–21.53	–2.83
	med	–37.50	–20.70	1.05	–24.20	–12.00	–22.45	–2.15
	dev	6.08	8.48	8.22	12.11	5.79	5.46	5.69
q07-obs	avg	–24.14	–6.99	2.96	–23.17	–7.94	–15.22	–8.40
	med	–22.40	–7.80	4.10	–22.05	–8.10	–14.40	–8.25
	dev	9.24	10.61	8.04	10.31	6.51	2.63	5.86
q07-for	avg	–8.14	0.05	11.36	–14.09	–3.75	–19.17	–7.44
	med	–9.80	0.60	11.50	–14.45	–3.30	–19.55	–6.60
	dev	7.94	7.02	6.46	13.54	5.74	3.95	6.36

Table D – cont.

		cont 2000.04—2002.06	exp 2002.07—2004.06	exp 2005.04—2008.03	cont 2008.04—2009.09	exp 2009.10—2012.06	cont 2012.07—2012.12	exp 2013.01—2019.12
q08-obs	avg	–53.69	–18.80	9.77	–42.98	–21.95	–49.38	–12.35
	med	–57.40	–17.70	13.65	–50.70	–22.50	–48.85	–11.10
	dev	13.38	16.90	13.90	25.77	9.19	5.38	15.83
q08-for	avg	–39.96	–12.45	7.68	–36.66	–20.52	–53.30	–15.75
	med	–40.50	–13.70	8.45	–37.20	–18.10	–53.40	–14.40
	dev	11.62	10.88	10.39	23.07	13.19	5.05	13.19

Notation: see Table B; cont—contraction phase, exp—expansion phase, obs—observed changes, for—forecasted (expected) changes; avg—average, med—median, dev—standard deviation.
Source: Own work.

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