

BUSINESS ENVIRONMENT AND PRODUCTION DYNAMICS IN BULGARIA: PRELIMINARY RESULTS FOR INDUSTRIAL SECTOR

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Abstract: *The paper suggests selected empirical results from a correlation analysis of the industrial dynamics and business environment factors in Bulgaria for the period 2010-2014. Covariation patterns are evaluated between the monthly industrial growth and several indicators of the business environment. New insights about possible effects of environmental variables are suggested concerning the industrial production dynamics during this period.*

Key words: *Business environment, industrial growth, Bulgaria.*

1. INTRODUCTION

Studies of various dimensions of the business environment in Bulgaria have been conducted frequently by both domestic and international researchers during the past 25 years of social transformations and market transition. The interest in this interdisciplinary area of research is constantly high due to the importance of the environmental conditions that should facilitate successful economic reforms. The economic growth literature indicates that such reforms, if based on macroeconomic stabilization and trade liberalization, are expected to establish a good environment for investment and growth – however, the analyses of the links between institutions and growth are still unclear [1]. A recent study of Holienka et al. (2016) finds that access to infrastructure acts as quite influential component of business environment reflected by the overall economic performance – along with it, the effectiveness of law enforcement, government programs, and market institutions are also key drivers of the entrepreneurial productivity around the world [2].

The turbulent social and economic transformations in Bulgaria during the last 20 years have been induced by major events as the bank system collapse and inflation crisis of 1996-1997, the introduction of Currency Board in 1998, EU accession period (up to 2006) and all structural shifts incurred due to the opening of Bulgarian economy to the EC common market regime and regulations. The global economic crisis of 2008-2009 additionally generated drastical economic downturn and a following period of stagnation and disruptive resurrection. Nevertheless, the competitive potential of Bulgarian economy proved to survive even in the harsh post-crisis years.

According to the comprehensive evaluation by the Global Competitiveness Index /GCI/ for 2014-15 and 2015-16 Bulgaria is positioned at rank 54 (of 140 countries) as compared to rank 62 in 2012-13 [3]. In particular, the rank on “Macroeconomic environment” pillar is 53, however, on “Infrastructure” the country rank drops to 72; notably, the rank on “Tehnological readiness” (38) is much more favorable than the rank on “Labour market efficiency” (68). According to the GCI survey the five most problematic environmental factors for doing

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business in Bulgaria are: (1) access to financing; (2) corruption; (3) inefficient government bureaucracy; (4) inadequately educated workforce; (5) policy instability.

Similarly, the World Bank /WB/ “Doing Business” survey positions Bulgaria at rank 28 (together with the Czech Republic) among 189 economies in respect of the ease of getting credit which is related to indicators about how well the credit system and bankruptcy legislation enable the access to bank funding [4]. According to another WB survey Bulgaria receives unfavorable scores on the majority of governance items (e.g. government accountability, corruption and regulatory enforcement) which had a limiting effect on the enhancement of productivity and overall country’s progress in the past decade [5].

This paper suggests a selection of preliminary results about the interrelations between production dynamics in Bulgaria for the period 2010-2014 and business environment factors. The scope of “production” is limited to the industrial sector¹³ output and the correlations between its growth and several indicators of business environment are estimated. New insights about possible effects of Bulgarian business environment are suggested concerning the dynamics of industrial production during the period of interest.

2. INFORMATION BASIS OF THE STUDY

Data from two relatively independent data sources within the National Statistical Institute of Bulgaria are utilized in the current study:

- Short-term Business Statistics /SBS/ – which estimates the short-run dynamics indicators of business units production;
- Business Survey in Industry /BSI/ – which estimates indicators reflecting managers or entrepreneurs' opinions about problems perceived, barriers encountered, and expected developments of the businesses they run.



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¹³ Here industrial sector includes: Mining and quarrying; Manufacturing; Electricity, gas, steam and air conditioning supply; Water collection, treatment and supply (NACE-2008 Sections B, C, D and Division 36). Separate indicators are estimated for the Construction sector.

SBS generates monthly data for the Industrial Production Index¹⁴ /IPI/ which measures the monthly relative change in industrial production volume. The monthly measurement of IPI captures:

- the receipts from sales of end products (goods and services);
- the changes in the stock of end products;
- the receipts from resale of goods purchased with such a purpose.

IPI is calculated after deflation of the value of production in order to compensate for price level shifts. This is performed using the “producer price indices” /PPI/ estimated by the regular NSI survey of producer prices.

BSI provides monthly information from a sample of representatives of business units (a total of 4200 interviews for all sectors, about 10% of which from Manufacturing)¹⁵. This survey requires a set of opinions to be recorded regarding the current situation and prospective development of their business¹⁶. Ordinal scale based on 3 response categories is used to operate a variety of questions related to issues of interest covered by the survey – e.g. “the expected direction of change of production / competitive position on the market / selling prices, etc. in the next 3 months will: (a) Increase, (b) No change, (c) Decrease”. On this basis, the so called “balance of opinions” is calculated monthly for each question /indicator/ as a difference of the relative shares of the positive and negative answers. Along with this, some indicators reflect quantitative measurements – e.g. assurance of production process by clients’ orders (number of months), capacity utilisation (%), etc.

The current study is particularly interested in a set of indicators derived from one question requiring answers to each of the 10 items suggested to the respondent. These items cover a range of main factors of the business environment. The respondent has to identify whether a particular factor has been acting as a barrier to the operation of the business unit by answering the question “*Which factors have hindered mostly the activity of your enterprise?*” (see Table 1). Each month NSI publishes the relative share of the managers who have identified the respective item as a factor having a significant adverse impact on the business activity at the moment of survey. This way, for each of the business environment factors a variable is constructed using this relative share monthly estimate.

No	Factors limiting the activity
1	Insufficient domestic demand of our product/s/
2	Insufficient foreign demand of our product/s/
3	Competitive imports of our product/s/
4	Shortage of labour
5	Shortage of materials and/or equipment
6	Shortage of energy
7	Financial problems
8	Weakness in economic legislation
9	Uncertain economic environment
10	Others

¹⁴ NSI, Short-term Business Statistics (<http://www.nsi.bg/en/content/6800/industrial-production-indices>).

¹⁵ NSI, Business Survey in Industry (NACE Rev.2) (<http://www.nsi.bg/en/content/4371/business-survey-industry-nace-rev-2>).

¹⁶ For more detailed methodological issues see [6].

Table 1: Business environment factors obstructing the business operations
(as outlined in the NSI Business Tendency Survey in Industry)



Figure 1: Dynamics of the relative share of respondents identified "Uncertain economic environment" as a hindering factor

The item reflecting a more general perception of an insecure business environment is defined as "Uncertain economic environment" in the framework of the survey. Its dynamics for the period of interest is presented on Fig.1. Several sub-periods with specific behavior of this variable are identified:

- 2000-2003 – with a sustainable upward shift by about 8-10 percentage points (from a level of 32% to level of 40-42%);
- 2003-2008 – a decrease of the share by about 20 percentage points (to 20-22%) which can be explained by the favorable changes in Bulgarian economy during the years before and in the start of the EU membership;
- 2008-2010 – rapid jump of the share by over 35 percentage points (up to levels of 55-60%) due to the first strokes of the global economic crisis of 2008-2009;
- 2010-2015 – a period of upholding a relatively high and stable mean level of the indicator (about 55%) during the period of economic stagnation and (believed) initial resurrection from the worst crisis situation.

Similar albeit not identical patterns of behavior are observed also for the other items representing the business environment in Bulgaria (domestic or international) incorporated into the NSI survey instrument.

3. CORRELATION BETWEEN BUSINESS ENVIRONMENT FACTORS AND INDUSTRIAL DYNAMICS

The correlation analysis is limited to the period 2010-2014 (60 monthly observations) due to the relatively homogeneous dynamics of the indicators, without any shocks or abnormal behavior. Table 2 presents the correlation coefficients between the IPI variable (i.e. the monthly change in industrial production) and each of the nine business environment variables.

In order to track for any short-term lagged effects – up to 2 months – additional correlation coefficients have been estimated using the lagged environmental variable of the form:

$$R_{f,j} = \frac{Cov(Y_t, X_{f,t-j})}{Std(Y)Std(X_f)}$$

where the numerator contains the estimated covariance between Y (IPI variable) and lagged variable Xf (environmental factor f=1,...,9; lag j=0, 1 and 2), and the denominator contains the product of the estimated standard deviations of Y and respective Xf.

Business environment factors	Lag 0		Lag 1		Lag 2	
	R	Sig	R	Sig	R	Sig
Insufficient domestic demand	-0.220	0.092	-0.216	0.098	-0.142	0.279
Insufficient foreign demand	-0.321	0.012	-0.402	0.002	-0.439	0.001
Competitive imports	0.209	0.108	0.209	0.109	0.174	0.183
Shortage of labour	0.302	0.019	0.261	0.044	0.256	0.049
Materials / equipment shortage	0.181	0.167	0.095	0.472	0.046	0.727
Shortage of energy	-0.365	0.004	-0.452	0.000	-0.494	0.000
Financial problems	-0.373	0.003	-0.383	0.003	-0.385	0.002
Weakness in economic legislation	0.349	0.006	0.332	0.010	0.228	0.080
Uncertain economic environment	-0.243	0.062	-0.274	0.034	-0.160	0.223

Notes: R- Pearson product-moment correlation coefficient estimated with lag up to 2 months; Sig-empirical level of significance of the correlation coefficient. Correlations marked in grey are statistically insignificant even at the marginal critical level of 10%.

Table 2. Correlation coefficients between IPI and the business environment variables

The results are quite indicative about the existence of statistically significant correlation between IPI and the survey generated business environment variables during the covered 5-years period. Negative signs of the correlation coefficients suggest that we observe a systematical **reduction** in production volume along with an **increase** in the share of managers indicating the respective item as adversely affecting their businesses. And vice versa – in case of a more favorable situation with the respective item (reflected by a lower frequency of its indication by the sampled managers) a systematical rise in IPI is observed for the period.

The largest negative coefficients (in the interval between -0.5 and -0.3) provide evidence for a **moderate correlation** of IPI and the following variables: (1) insufficient foreign demand; (2) shortages of energy; (3) financial problems. For these variables not only contemporaneous but also lagged effects have been estimated as significant showing that any unfavorable situation with such variable is reflected by a deferred negative reaction of IPI one or two months later.

Somewhat weaker but still negative correlations (in the interval between -0.3 and -0.2) showing a lower degree of covariation is observed between IPI and the following variables: (4) insufficient domestic demand; (5) uncertain economic environment. For each of these two variables the contemporaneous effect is accompanied by a lagged effect, however, only with a lag of 1 month. These results appear to be somewhat subtle as their critical level of significance is 10% – but even at this level the correlation of IPI with the 2-months-lagged variables is not found as statistically significant.

Curious results have been obtained in respect of other two variables: (6) shortage of labour; (7) weakness in economic legislation. For these variables week to moderate correlations have been estimated – not only contemporaneously but also with lags 1 and 2 months – however,

showing a *positive sign* of the covariation with IPI variable. This sign implies that monthly IPI moves (on average) upward along with increments in the share of managers indicating an adverse impact of this environmental variable. Even though the negative sign was initially expected, a plausible explanation for these results can be derived – in periods of actual expansion of industrial output the managers express higher concerns regarding:

- the chronic shortage of workforce in industrial sectors (especially high-skilled);
- the problems induced by flaws in the legal regulations (which, on the contrary, is expected to assist and facilitate the operation of business units).

Statistically insignificant correlations are estimated for the variables: (8) competitive imports; (9) shortages of materials/equipment. Nevertheless, the positive signs of the coefficients are still indicative for possible effects similar to the latter two variables. In other words, the industrial activity intensifies to meet a market demand even though the managers indicate expanded unfavorable impact of the competitive imports, along with scarcity of quality material inputs, equipment, etc.

4. CONCLUSIONS

The presented empirical results are indicative about the objectively existing interrelations between business environment variables and industrial growth – especially when independent data sources are used to estimate correlations between variables of interest. Governance policies should adopt levers that are capable in alleviating the weaknesses and circumventing the main threats to the national competitiveness – measures that are firmly targeted in improvement of the most problematic business environment components [7]. Especially, policies accelerating the innovation processes, reforming the law enforcement, and restraining the bureaucratic barriers could be most effective for the stabilization of business activities.

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