UDC 339.13:669.015

V. Gonchar,
DrHab (Economics),
Priazovskyi state technical university, Mariupol, Ukraine

FORECASTING AS A METHOD OF METALS MARKETING RESEARCH

Setting the problem. The problem of predicting the dynamics of the steel market, demand and supply on the basis of general economic trends is defined. High export dependence metallurgical industry in Ukraine led to the need to examine current trends in the world market, and identify potential sources of competition in the future. The analysis of existing speaker characteristic steel markets in different regions of the world is held. For analysis of the world market is divided into 8 regions: Asia, EU, Europe, CIS, Middle East, Africa, North and South America. The productions dynamics trends are evaluated. The modified method of forecasting the market is applied, based on data from the International Monetary Fund, GDP in the world and in steel production according to data from the International Steel Association from 2002 to 2015. The research results identified a close correlation of GDP and steel production volume in the world, Asia, the Middle East and Europe. The regions leaders and outsiders are distinguished after metallurgical production consumption analysis in the world. The demand level of the advanced economy was defined by the consumption per capita in developed countries of European Union. Based on this research, the production forecast is built in the world and in the Middle East, Asia, and Europe.

Statement of the problem. In the context of increasing goods and services market dynamism there is an objective necessity in conducting market research by using existing methods of forecasting market trends.

Effective solution to this problem directly affects the performance of the companies. Enterprises operating in the local market to determine the dynamics of the local market and to project the development of world trends in the local market. To enterprises engaged in foreign trade, a more complex task, which requires evaluation of a large number of factors. The impact on the internal factors and worldwide operating in the sector was identified. The performance of each company depends on building an effective marketing policy, which in turn depends on the accuracy of predicting the dynamics of markets. High export orientation of Ukrainian metallurgical enterprises increased the need to analyze the dynamics of the global steel market is. The average share of exports from 2002-2015 was estimated at level of 74.3%. More accurate assessment of market trends will give the opportunity to our metallurgists quickly coordinate types and amounts of products to market trends, and stimulate to build economic relations, in the regions where the expected growth in demand for the products.

The last research analysis. Problems of the theoretical aspects of forecasting market trends are reflected in the works of G. Kassel, V. Pareto, L. Walras, D. Hicks, A. Marshall, V.M. Glushkov, A.N. Efimov, D. Bell, T. Gordon, B. de Jouvenel, D. Gabor, F. Polak, M.V. Bikeeva, N.E Egorova, S.N. Iliashenko.

In spite of this big development of this topic in the economic theory, the effectiveness of forecasting methods by the market still needs further research. Forecasting techniques which have been effective in resent 15-20 years show a dramatic reduction in its effectiveness due to the dynamism of economic factors. Forecasting dynamics in different sectors of the economy needs to be modified to suit individual methods of specific trends in the industry. Thus, in spite of a long study of the problem remains relevant and requires constant updating according to current market trends.

The purpose of the article is to provide marketing research of the steel market and forecast trends of regional steel markets, that are based on general development economic and economic systems indicators. It has been done a model of regional markets for the next 5 years, in order to predict the national producer's threat of competition from domestic producers of steel.

The main part.

Marketing is a complex and systematic process of collecting and analyzing information in order to reduce uncertainty and risk of decisions for business purposes. The main purpose of market research is to obtain information and ideas about the structure and dynamics trends of the market and enterprise opportunities to better adaptation its production structure, technology, product or service to the demand and the requirements of consumers [4].

Forecasting – is the scientific study of the prospects of humanity, the subject of which study is the future, and the product, the result of research by research findings on the state of the variant of the object [1].

A vital challenge confronting economists is how to forecast. The task is yet more exacting but ever more pertinent during a recession because livelihoods seem to depend on forecasts – will unemployment fall soon enough to stave off foreclosures?

Perhaps unsurprising then is a recent clash in the blogosphere over forecasting US GDP in the coming quarters. Greg Mankiw contested the US government's forecasts of GDP growth, questioning the trend stationarity assumption upon which the forecasts were made. Paul Krugman wrote an outraged response, accusing Mankiw of "evil wonkishness" [9]. Brad DeLong weighed in too, pointing out that a univariate analysis was "useless"; unemployment must be included in the analysis.

The exchange emphasises not just that economic variables are important in forecasts, but that econometric issues matter. If GDP is trend stationary, the implications are very different for forecasting than if GDP is

a random walk with drift – one will correct to some equilibrium, the other won't. Economic nuances matter too – what other variables make up this equilibrium relationship? Historically, there has been such a steady state, but whether that is the same one to which we will soon correct is unclear, and bad forecasts may result.

Finally, much has been made of prediction markets as effective forecasting models [13]. Market participants in prediction markets buy and sell contracts whose payoff is contingent on a particular event happening, such as a recession in the US by the end of 2008. Evidence suggests that such markets are well calibrated; if a contract is at 90%, then 9 times out of 10 that contract will pay out [10; 11]. Perhaps the way forward is to forecast using prediction markets [5] ?

Economic forecasts are widely used at the firm, industry, and economy-wide level. For a firm, economic forecasts facilitate planning for future production, expansion, or contraction. For example, a retailing firm that has been in business for the last 25 years may be interested in forecasting the likely sales volume for the coming year. Similarly, the auto industry may want to know the total demand for vans in the coming model year. Both production plans and the extent of competition in the automobile industry may depend on the magnitude of the forecasted auto demand. At the economy-wide level, one may want to know the economic forecast for growth in the real gross domestic product. One may also be interested in other macroeconomic variables such as the projected inflation rate. There are numerous techniques that can be used to generate economic forecasts [12].

While the term "economic forecast" may appear to be rather technical, planning for the future is a critical aspect of managing any organization—business, nonprofit, or other. In fact, the long-term success of any organization is closely tied to how well the management of the organization is able to foresee its future and to develop appropriate strategies to deal with likely future scenarios [6].

Intuition, good judgment, and an awareness of how well the economy is doing may give the manager of a business firm a rough idea (or "feeling") of what is likely to happen in the future. Nevertheless, it is not easy to convert a feeling about the future into a precise and useful number such as the next year's sales volume or the raw material cost per unit of output [7].

Suppose that a forecast expert has been asked to provide estimates of the sales volume for a particular product for the next four quarters. How should one go about preparing the quarterly sales volume forecasts? One will certainly want to review the actual sales data for the product in question for past periods. Suppose that the forecaster has access to actual sales data for each quarter over the 25-year period the firm has been in business. Using these historical data, the forecaster can identify the general level of sales. He or she can also determine whether there is a pattern or trend, such as an increase or decrease in sales volume over time. A further review of the data may reveal some type of seasonal pattern, such as peak sales occurring before a holiday. Thus by reviewing historical data over time, the forecaster can often develop a good understanding of the previous pattern of sales. Understanding such a pattern can often lead to better forecasts of future sales of the product. In addition, if the forecaster is able to identify the factors that influence sales, historical data on these factors (or variables) can also be used to generate forecasts of future sales volumes [10].

There are many forecasting techniques available to assist in business planning. All forecasting methods can be divided into two broad categories: qualitative and quantitative. Many forecasting techniques use past or historical data in form of time series. A time series is simply a set of observations measured at successive points in time or over successive periods of time. Forecasts essentially provide future values of the time series on a specific variable such as sales volume. Division of forecasting methods into qualitative and quantitative categories is based on the availability of historical time series data [8].

When historical data are not available, qualitative forecasting techniques are used. Such techniques generally employ the judgment of experts in the appropriate field to generate forecasts. Quantitative forecasting methods are used when historical data on variables of interest are available—these methods are based on an analysis of historical data concerning the time series of the specific variable of interest and possibly other related time series [9].

There are two major categories of quantitative forecasting methods. The first type uses the past trend of a particular variable to base the future forecast of the variable. As this category of forecasting methods simply uses time series on past data of the variable that is being forecasted, these techniques are called time series methods. The second category of quantitative forecasting techniques also uses historical data. But in forecasting future values of a variable, the forecaster examines the cause-and-effect relationships of the variable with other relevant variables such as the level of consumer confidence, changes in consumers' disposable incomes, the interest rate at which consumers can finance their spending through borrowing, and the state of the economy represented, by such variables as the unemployment rate. Thus, this category of forecasting techniques uses past time series on many relevant variables to produce the forecast for the variable of interest. Forecasting techniques falling under this category are called causal methods, as the basis of such forecasting is the cause-and-effect relationship between the variable forecasted and other time series selected to help in generating the forecasts. Some economic forecasts are generated using a hybrid of the above two methods [9].

An important starting point in the forecasting process is the re-assessment of the economic climate in individual countries and the world economy as a whole. Here, a combination of model-based analyses and statistical indicator models play an important role in "setting the scene" at the start of each projection round.

A first step is to look at the range of relevant new information since the last projections were produced –

such as changes in commodity prices (in particular the oil price), exchange rates and interest rates, fiscal trends, the path of economic activity and other key variables – to see how the recent past has developed differently from what was previously expected. With this new information, and using the previous set of projections as a starting point, the effects of the new elements and revised judgments are typically assessed on the basis of model simulations using the NIGEM global model and short-term indicator models. Thus the likely impact of combined and individual changes in assumptions and new information on key aggregates can be assessed in consistent fashion for each of the major economies and economic groupings. These results are mechanical and therefore intended to be no more than a guide to the informed judgments of country and topic experts on the underlying "forces acting".

Is generally distinguished three major campaign to methods of forecasting the market dynamics:

• Traditional (genetic) – a retrospective analysis of the actual number of requests for services and heuristically identification of major trends that shape their future amount.

• Classic – prediction, given according to the limited number of dominant factors (usually – income and price);

• Modified – adaptation of the classical approach to the complex process of the formation of the modern demand for services [2].

This study is based on a modified approach, of forecasting the dynamics of the market. The study used the data of countries production grouped by geography (table 1), according to the data of World Steel Association [3,5]. Identified the following regions: The European Union (27), (10), CIS (7), North America (7) South America (9) Africa (13), Middle East (7), Asia (16). Countries grouping into the regions can more accurately determine the market trend, while reducing the number of different trends existing in the national markets.

Table 1

Dynamics of production of steel in 2010, 2015 (tons)

Region	2010	2011	2012	2013	2014	2015	Growth rate, %
EU	206903	210179	198229	139336	172777	177652	13,3
European countries (not members of the EU)	28205	30608	31710	29076	33734	39164	24,2
CIS	119906	124169	114345	97645	108200	112663	29,0
North America	131789	132618	124494	82578	111565	118893	13,5
South America	45298	48232	47354	37776	43894	48365	37,8
Africa	18695	18675	16970	15400	16624	15697	32,4
Middle East	15376	16452	16646	17656	20000	23002	29,5
Asia	674126	757285	783040	810346	916721	975614	49,4
World market production	1248991	1347002	1341212	1235827	1431664	1518299	28,0

The purpose of this analysis is to identify regions that are expected to increase demand for steel, the duration of this dynamic and factors affecting it. Another purpose is the definition of the regions that are building their own production capacities to displace foreign manufacturer. In addition there is a necessity of determination a period when, regions - importers will turn into regions - exporters. The input data used for the analysis of production volumes, level of consumption and GDP data for the consumer ability at current prices in U.S. dollars, steel consumption per capita.

GDP data (table 2) were used to determine the overall economic trends, operating in the world. Has been revealed the dependence between production and GDP's growth is the usage of steel in all sectors of the economy.

Table 2

The dynamics of GDP in purchasing power parity. (in current prices bill. $US)

Region	2010	2011	2012	2013	2014	2015	Growth rate, %
EU	13717	14587	14992	14490	14987	15542	-14,1
European countries (not members of the EU)	1560	1675	1734	1685	1802	1938	38,9
CIS	2635	2953	3179	2991	3176	3400	-6,0
North America	16049	16855	17209	16785	17472	18209	-9,8
South America	3301	3631	3913	3939	4257	4550	6,8
Africa	1708	1858	1991	2065	2191	2262	-16,0
Middle East	1841	2000	2116	2180	2333	2384	49,6
Asia	17729	19824	21334	22286	24510	26492	44,7
World market production	61705	66835	70140	70154	74684	78970	21,6

Analysis of the dependence of steel of GDP shows that the world's steel production volumes are correlated with GDP. The study showed that the dependence of global steel production of the GDP by the equation y = 17,281 x + 136 610, where X is the world's GDP, with the magnitude squared R2 = 0,9431, indicating high distress communications.

In terms of regions, the most intimate connection GDP-production observed in the following regions:

Europe y = 21,421 x - 4850,3; R2 = 0,957.,

Asia y = 40,407 x - 74,492; R2 = 0,9873.,

Middle East y = 7,2417 x + 2927,5; R2 = 0,8431.

These dependences show that in the world there is a steady growth of GDP, which stimulates the growth of steel production. The world average GDP growth of 17.281 billions $US provides production growth of 1 000 tonnes.

There is almost no dependence of GDP-production in the EU y = -3,7064 x + 238 796; R2 = 0,0771, CIS y = 3,9018 x + 101 131; R2 = 0,0728, South America y = 1,2343 x + 40,237; R2 = 0,0765, Africa y = =-0,337 x + 17,477; R2 = 0,0105.

To clarify the reasons for the lack of correlation in the EU, CIS, South and North America and Africa we consider the consumption of finished steel products in these regions, per capita. This indicator is the most accurate reflection of level of usage of steel in the country's economy, showing the population's production industry. In the more developed regions of the world: North America, the EU, which was consumed from 2002 to 2015, an average of 264.57 and 338.5 kg / capita, the highest number per capita were consumed in the UAE in 2008. 2210.9 kg / capita. According to the study, the growth of GDP and production was observed in regions of the world, which, since 2002. steel consumption population far below the consumption of the more developed regions: the EU and North America, but high growth (GDP growth 2002-2015. European countries, 73.3%, Middle East 89.8%, Asia -116%) stimulated the growth of domestic demand in the region, which in turn led to a significant increase production in the regions, what we are seeing in Asia, Europe, the Middle East.

Table 3

Forecasting of GDP growth in 2017 - 2019

Country\Year	2017	2018	2019
European countries	2301,79	2425,61	2562,78
Middle East	2830,58	2982,75	3151,95
Asia	35452,59	38431,51	41785,65
World market	97254,45	103479,8	110405,4

Table 4

Forecasting of steel production in the regions of the worlds in 2017 - 2019

Country\Year	2017	2018	2019
European countries	44456,34	47108,69	50047,01
Middle East	23425,71	24527,68	25752,98
Asia	1358041	1478410	1613941
World market	1817264	1924845	2044525

In most developed countries: EU, USA, Canada, Japan, South Korea, where over the study period, GDP per capita was high, there were only the fluctuations of consumption goods sector, depending on the economic situation in the region. Consumption data in these regions are used as the upper limit, above which the growth of GDP is no longer a significant impact on production and consumption in the region. Continuing the trend in production capacity in the region will need to search for sharp market outlets, which will make the competition Ukrainian steel industry. As for the countries of South America and Africa, they share low levels of production and consumption, in the absence of significant growth trends. For the CIS market is inherent high prevalence of production over domestic demand, which forces seek foreign markets, at the same time, domestic consumption is almost not developed (201kg/ capita) and much lower than the neighboring countries of Europe (252kg/ capita)

According to the data analysis of the dependence of production and GDP, and consumption of steel per person construct a forecast of production (Table 4). The input data used in the GDP data from the International Monetary Fund (Table 3).

The projections show that by 2017, the Asian per capita consumption over and above the EU average for 2002-2015, after which it is possible to expect reduction of growth rates in the region. In Europe and the Middle East, this boundary if the current trends will be achieved by 2018.

Conclusions. Middle East, and Europe until 2017, taking into account the general economic trends and market demand for the products of the metallurgical industry end users. Improving the effectiveness of forecasting the metallurgical industry allows advance rebuild production requirements demand. Improving forecasting technique allows regional competition increases the level of information security management, which positively affects the quality of the developed measures to reduce the risks of competition. According to the forecast, in the preservation of current economic trends, it is necessary to expect a 2017 2018godu, the saturation of domestic demand steelmakers in Asia, Europe and the Middle East. Projected domestic production, in which a saturation of the market for Europe is 50,047 tons, the Middle East 25,752.98 tonnes, 1,613,941 tonnes of Asia.

References

1. **Арефьева Н. Т.** Прогнозирование и его социокультурные цели [Электронный ресурс] / Н. Т. Арефьева // Знание. Понимание. Умение: электронный журнал. – 2010. – №4. – Режим доступа: http://www.zpu-journal.ru/e-zpu/2010/4/Arefieva/.
2. **Басовский Л. Е.** Прогнозирование и планирование в условиях рынка: учебное пособие / Л. Е. Басовский. – М.: ИНФРА-М, 2003. – 259 с. 3. **Всемирная** ассоциация производителей стали [Электронный ресурс] – Режим доступа: http://www.worldsteel.org/statistics/statistics-archive/yearbook-archive.html.
4. **Окландер М.А.** Поведінка споживача / М.А. Окландер, І.О. Жарська. – К.: Центр учбової літератури, 2014. – 209 с. 5. **Офіційний** сайт Всесвітнього валютного фонду «World Economic Outlook». [Електронний ресурс]. - Режим доступу: http://www.worldeconomicoutlook.com. 6. **Пономаренко В. С.** Аналіз даних у дослідженнях соціально-економічних систем: монографія / В. С. Пономаренко, Л. М. Малярець. – Х.: ВД «ІНЖЕК», 2009. – 430 с. 7. **Портер Е.** Майкл. Конкурентная стратегия: Методика анализа отраслей и конкурентов / Майкл Е. Портер; пер. с англ. – М.: Альпина Бизнес Букс, 2005. – 454 с. 8. **Anderson, David R.**, Dennis J. Sweeney, and Thomas A. Williams. An Introduction to Management Science: Quantitative Approaches to Decision Making. 8th ed. Minneapolis/St. Paul: West Publishing, 1997. 9. **For Greg** Mankiw's blog, see "GREG MANKIW'S BLOG / Random Observations for Stu-

dents of Economics". Retrieved from http://gregmankiw.blogspot.jp/2013/02/a-profile-of-stanley-fischer.html. 10. **Day G.S.** Analysis for Strategic Marketing Decisions. West Publishing Company, 1986. 11. **Doornik, J.A.** (2009), 'Autometrics', in 'The Methodology and Practice of Econometrics: A Festschrift in Honour of David F. Hendry', Castle, J.L and Shephard, N. (eds.), OUP, Oxford. 12. **Hendry, David F.** and Hans-Martin Krolzig (2005). "The Properties of Automatic GETS Modelling" Economic Journal, Vol. 115, No. 502, pp. C32-C61, March 2005. 13. **Wolfers, Justin** and Eric Zitzewitz (2004) Prediction Markets, The Journal of Economic Perspectives, Vol. 18, No. 2 (Spring, 2004), pp. 107-126

Гончар В. В. Прогнозування як метод маркетингового дослідження ринку металопродукції

Визначено проблеми прогнозування динаміки розвитку металургійного ринку, попиту та пропозиції на підставі загальноекономічних тенденцій. Висока експортна залежність металургійної галузі України зумовила необхідність вивчення тенденцій, діючих на світовому ринку, і визначення потенційних джерел конкуренції в майбутньому. Проведено аналіз існуючих динамік, характерних металургійному ринку регіонів світу, оцінено тенденції розвитку, динаміку обсягів виробництва. Для проведення аналізу світовий ринок розділений на 8 регіонів: Азія, ЄС, Європа, СНД, Близький Схід, Африка, Північна і Південна Америка. Застосовано модифіковану методику прогнозування ринку на основі даних ВВП міжнародного валютного фонду в країнах світу та обсягів виробництва сталі в країнах світу згідно даних міжнародної асоціації виробників сталі з 2002 по 2015 рік. Результати проведеного дослідження дозволили виділити тісну кореляцію між ВВП та обсягом виплавки сталі в світі, країнах Азії, Близького Сходу та Європи. Проведено аналіз споживання продукції металургійної галузі, на основі якого виділено регіони - лідери споживання і аутсайдери. Споживання на душу населення в розвинених країнах Європейського Союзу дозволило визначити граничний попит на продукцію галузі для розвиненої економіки. На основі даних досліджень побудовано прогноз виробництва в світі і в країнах Близького Сходу, Азії, Європи.

Ключові слова: маркетингові дослідження, прогнозування, споживачі сталі, металопродукція, ВВП.

Гончар В. В. Прогнозирование как метод маркетингового исследования рынка металлопродукции

Определены проблемы прогнозирования динамики развития металлургического рынка, спроса и предложения на основании общеэкономических тенденций. Высокая экспортная зависимость металлургической отрасли Украины обусловила необходимость изучения тенденций, действующих на мировом рынке, и определения потенциальных источников конкуренции в будущем. Проведен анализ существующих динамик, характерных металлургическому рынку регионов мира, оценены тенденции развития, динамика объемов производства. Для проведения анализа мировой рынок разделен на 8 регионов: Азия, ЕС, Европа, СНГ, Ближний Восток, Африка, Северная и Южная Америка. Применена модифицированная методика прогнозирования рынка на основе данных ВВП международного валютного фонда в странах мира и объемов производства стали в странах мира согласно данных международной ассоциации производителей стали с 2002 по 2015 год. Результаты проведенного исследования позволили выделить тесную корреляцию ВВП – объем выплавки стали в мире, странах Азии, Ближнего Востока и Европы. Проведен анализ потребления продукции металлургической отрасли, на основе которого выделены регионы - лидеры потребления и аутсайдеры. Потребление на душу населения в развитых странах Европейского Союза позволило определить граничный спрос на продукцию отрасли для развитой экономики. На основе данных исследований построен прогноз производства в мире и в странах Ближнего Востока, Азии, Европы.

Ключевые слова: маркетинговые исследования, прогнозирование, потребители стали, металлопродукция, ВВП.

Gonchar V. Forecasting as a method of metals marketing research

The problem of predicting the dynamics of the steel market, demand and supply on the basis of general economic trends is defined. High export dependence metallurgical industry in Ukraine led to the need to examine current trends in the world market, and identify potential sources of competition in the future. The analysis of existing speaker characteristic steel markets in different regions of the world is held. For analysis of the world market is divided into 8 regions: Asia, EU, Europe, CIS, Middle East, Africa, North and South America. The productions dynamics trends are evaluated. The modified method of forecasting the market is applied, based on data from the International Monetary Fund, GDP in the world and in steel production according to data from the International Steel Association from 2002 to 2015. The research results identified a close correlation of GDP and steel production volume in the world, Asia, the Middle East and Europe. The regions leaders and outsiders are distinguished after metallurgical production consumption analysis in the world. The demand level of the advanced economy was defined by the consumption per capita in developed countries of European Union. Based on these research, the production forecast is built in the world and in the Middle East, Asia, and Europe.

Keywords: marketing research, forecasting, steel consumers, steel, GDP.

Received by the editors: 17.10.2016
and final form 28.12.2016