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FORECASTING INDUSTRIAL VALUE OF THAI NGUYEN STEEL JOINT STOCK COMPANY FOR THE PERIOD OF 2017-2020

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ABSTRACT

In production and business activities, analysis and forecasting plays a very important role. From forecasting, we can develop plans and strategies to maximize profits and minimize production costs.

At present, in the world, the analysis and forecasting problem has been widely applied in production and business activities, such as forecasting activities of GDP, banking and finance, unemployment, ... In Vietnam, the analysis and forecasting problems have been studied and proposed by some managers and economic specialists in a number of specific fields such as analysis and forecast. Financial situation, forecast of stock price fluctuation, forecast of impact of foreign investment capital and price forecast of some commodity materials.

In order to promote the development of the Vietnamese economy, to ensure social security, and to have employees earn more income, it is very important that managers in key economic groups should develop solutions, exploit the tools and advantages of information technology to support the analysis and forecast revenue.

In order to improve the understanding and practical approach to the production process, we have been able to practice at Thai Nguyen Iron and Steel Joint Stock Company. Thanks to that, it gives you a great source of knowledge about the production process at the company. Through a period of practice together with his passion for scientific research, he wishes to contribute a little to the company, which will help the company grow. Below is my research paper with the topic: Forecast of industrial production value of Thai Nguyen Iron and Steel Joint Stock Company for the period 2018-2021.

Keywords: Forecasting, linear regression, industrial production efficiency, industrial production value, iron and steel companies.

An overview of the Thai Nguyen industry

Industry is the main economic sector, holding the leading position in the national economic structure. Industrial development is one of the key tasks for successful implementation of industrialization and modernization (industrialization and modernization) of the country. Resolution No. 23-NQ / TW on orienting the development of national industrial development policy up to 2030 with a vision to 2045 clearly states: "By 2030, Vietnam will complete its industrialization, to modernize, basically become an industrial country in the direction of modernization; among the top three countries in ASEAN industry. " In order to achieve that goal,

there is a need for continuous efforts of all provinces in economic development, especially in industry. Therefore, in order for industry to be an important pillar of the economy in the process of industrialization, modernization and international integration, the industry should be oriented towards comprehensive and sustainable development. .

Thai Nguyen is a province in the Northern Midland and Mountain Region (TDMNPB), with potential and strength in resources, has a long tradition in industrial development, once considered the cradle of the metallurgical industry. country. In the past years, especially since the re-establishment of Thai Nguyen province (1997), the provincial leaders have grasped the opportunities, put forth policies and policies for socio-economic development and industrial development. there have been some successes in economic development. The economic structure of Thai Nguyen province has shifted positively towards increasing the Gross Domestic Domestic Product (GRDP). In the general economic structure, industry plays an extremely important role, contributing significantly to changing economic structure of the province. The development of Thai Nguyen industry in recent years has achieved positive results and is highly appreciated.

However, to date, the development industry has not matched the scale and resources available, low business performance, Thai Nguyen is still a poor province, some socio-economic indicators lower than the average the whole country. A number of well-known enterprises, which were the driving force behind the economic development of the whole province, also fell into recession, leading to the bankruptcy of Thai Nguyen Iron and Steel. Industrial enterprises are heavily dependent on foreign direct investment and there is no strong integration to create breakthrough developments, moving from satellite enterprises to integrating deeper into the supply chain. global response. Particularly, under the pressure of international integration, the task of the province is to come up with solutions and identify appropriate directions to promote the advantages of attracting investment capital and overcoming shortcomings. Business activities of enterprises.

Therefore, in order to successfully achieve the objectives of the country in general and of the province in particular, Thai Nguyen must strive to maximize its advantages, overcome current difficulties as well as objectively. To accelerate the cause of industrialization and modernization. Industry development should be regarded as the central focus of industrialization and modernization because industry is the leader, the main economic sector of the economy. Researching on industrial development in the province is a necessity, in order to identify the real situation of development so that the right orientations and solutions for industrial development will be obtained, thus contributing to the successful realization of the target. : promote the industrial development of the province commensurate with the potential to come before 2020, soon to bring Thai Nguyen province into an industrial province in the direction of modern.

Thai Nguyen is located in the midland and mountainous areas of northern Vietnam and the capital city of Hanoi. With its position as one of the political, economic and educational centers of Viet Bac area in particular, in the area of TDMNPB in general, Thai Nguyen is considered to be the gateway of the southern intersection, linking the North with Hanoi. , provinces in the Red River Delta with other provinces in the country.

Thai Nguyen is located in the northeastern region of Vietnam, in the belt of Pacific-Pacific biomass, the soil has great potential for mineral resources. Through the synthesis of geological documents, up to now, more than 250 mines and mines have been found in the province (including 176 mines, mineral spots have been announced and over 74 mines , new mineral spots discovered, surveyed, explored and assessed in terms of quality, reserves), including 24 types of minerals, 05 groups: Mineral fuel, metal minerals, minerals minerals, minerals for construction materials and mineral water. In particular, there are some minerals with high reserves such as tungsten (about 100 million tons), coal (about 80 million tons), iron (about 40 million tons), titanium (about 8 million tons); lead - zinc (about 0.5 million tons), limestone cement (about 200 million tons). Mineral resources of Thai Nguyen are concentrated in Dong Hy, Vo Nhai, Phu Luong, Dai Tu districts.

In general, mineral resources of Thai Nguyen Province are rich in various kinds, meaningful in the whole country such as iron, coal (especially fat coal), Titanium, tungsten .... It is a great comparative advantage in the development of metallurgical and mining industries and is an opportunity to attract investors. Currently, Thai Nguyen province is encouraging investment projects in the field of deep processing of minerals on a large scale. It is noteworthy that iron minerals have given the local a remarkable advantage in the development of metallurgical industries, mining, construction materials production etc. This is the premise for promoting other industries. The province has developed into one of the big metallurgical centers in the country.

General theories of forecasting

Data analysis and forecasting are an important element of most business decisions and economic planning. Analyze data and forecasts as a set of tools that help decision makers make best judgments about future events. Analytical and forecasting problems have been studied and proposed by some managers and economists in a number of specific fields: financial analysis, monetary analysis, financial policy formulation and management, modeling of major social statistics forecasts, forecasting stock price fluctuations, forecasting the impact of foreign investment capital, forecasting prices Some items of capital goods. However, these studies have not focused much on predicting the value of industrial production in order to obtain development measures that bring high economic efficiency.

In the process of international economic integration, in order to survive and develop steadily, the industry must have suitable new solutions in order to develop sales and quality. One of the urgent tasks of the solutions is the analysis, evaluation and forecast of industrial production in the following years in Thai Nguyen Iron and Steel Joint Stock Company.

Therefore, the study proposed a solution to develop a program for analysis and forecasting of industrial production is an urgent task.

The first task of correlated regression analysis is to construct a regression model and to determine the nature and form of the relationship (type of model).

Model predicted by regression equation:

$$y = a + bx$$

Inside:

x: The value of the causality (cause) variable (independent variable).

y: The adjusted value of the criterion is influenced (the result) (dependent variable) in relation to t.

a: The freedom coefficient (the blocking coefficient), which is the starting point of the theoretical regression line, shows the influence of other factors (other causal determinants) beyond x to the variation of y.

b: Regression coefficient (slope, slope), which reflects the direct effect of the causality criterion x on the outcome criterion y. Each x is incremented by one unit, y will change by the average of b units, and b denotes the direction of the relation: b> 0: Forward relationship; b <0: inverse relationship.

+ The method of determining the parameters a and b must be determined so that the theoretical approximation best describes the actual relationship. The distance from the actual point to the point of the least theoretical regression line will be the best.

From the above equation by least squares or through the order of time (t) in the sequence to calculate the parameters a, b

If the order of time t such that $\sum t \neq$we have the following formula:

$a = \frac{\overline{y.t} - \bar{y}.\bar{t}}{t^2 - \overline{t^2}}$ $b = \bar{y} - a.\bar{t}$

If ordering time t such that $\sum t = 0$we have:

$a = \frac{\sum y}{n} = \bar{y}$ $b = \frac{\sum yt}{t^2}$

Research methodology

The tool used to predict is the Excel Data Analysis tool. This is a data analysis toolkit that is built into the Microsoft Excel software. Using the Data Analysis tool allows us to analyze the relationship. The relationship between variables is fast, convenient, and produces accurate results that are appropriate for the study process. Specifically, in this article we use the method of prediction that is linear regression, from which We will find out which method is the most effective, most effective.

The article uses the survey method, collecting production data from previous years through reliable sources, have been verified. From these sources, we will select the appropriate data sets for the research to carry out the analysis and forecast. The objective of this study is to provide a linear regression equation from which we proceed to predict the industrial production value for the following years. From there the decision maker will be able to predict precisely the relationship between the factors that need to be studied and a more comprehensive view of the issues that need to be researched in order to make the right decisions and policies for the future. The study was conducted with the data collected from 2008 to 2016 according to accurate data from the General Statistical Office of Thai Nguyen.

- Investigate the relationship between variables and provide a linear regression equation using the Excel Data Analysis tool.

Analyze the relationships of variables in the model and explain them.

Research results

first. Results of the study

After studying and researching about the industrial production value of Thai Nguyen Iron and Steel Joint Stock Company, we have obtained the following results:

Table 1: Annual industrial production value table

Year	Industrial production value (Unit: VND billion)
2007	**1865**
2008	**1948.8**
2009	**2240**
2010	**2250**
2011	**2280**
2012	**2317**
2013	**2250**
2014	**2214**
2015	**2699**
2016	**2739**

(Source: Tisco.com.vn and Vietstock.vn)

From the above table we see that industrial production value increases gradually from 2007 to 2012 and that there will be a slight decrease in 2013 and 2014 and again increase in 2015 and 2016. Since the data series only decrease in 2013, we can apply the forecast by linear regression method for the above data series.

Using the Data Analysis tool to solve the regression equation we obtained the result table:

Table 2. Results table anova

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.871194525
R Square	0.7589799
Adjusted I	0.728852388
Standard I	142.8457278
Observatic	10

Table 3. Analysis of variance

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regressior	1	514045.44	514045.44	25.192252	0.001027916
Residual	8	163239.216	20404.9019		
Total	9	677284.656			

Table 4. Regression analysis

	Coefficients	*tandard Erro*	*t Stat*	*P-value*
Intercept	-156498.996	31634.4845	-4.9471012	0.001125
X Variable	78.93575758	15.726797	5.01918842	0.0010279

Some terms in the results table:

• Regression Statistics: Parameters of the regression model.

• Multiple r: The multiple correlation coefficient ($0 \leq r \leq 1$), indicating the degree of correlation of the multiple correlations.

• Square: The coefficient of determination, which indicates the variation in the dependent variable y, is how many% of the variation is due to the independent variables x and the remainder due to the random error.

• Adjusted r: Adjustment coefficient, which is a deterministic factor that takes into account the magnitude or magnitude of the degree of freedom df.

• Standard Error: Standard error of y due to regression.

• Observation: Number of observations or sample size.

• Regression: Due to regression

• Residual: Do random

• Total: Total

• Df (Degree of freedom): Number of degrees of freedom

Review and evaluate results:

Based on the above results we have a linear regression equation: Y = -156499+ 78.94X

Inside: Y: Industrial production value; X: Number of years to forecast

According to the linear regression program, we forecast the production value for the following years:

+ In 2017, instead of x = 2017 we have:

y = -156499+ 78.94 * 2017 = 2722.98 ± 142.8457

+ In 2018, instead of x = 2018 we have:

y = -156499+ 78.94* 2018 = 2801.92± 142.8457

+ In 2019, instead of x = 2019 we have:

y = -156499+ 78.94 * 2019 = 2880.86± 142.8457

+ In 2020, instead of x = 2020 we have:

y = -156499+ 78.94* 2020 = 2959.8 ± 142.8457

In addition, based on the results table we see:

+ When x increases by 1, it will increase y to VND 78.94 billion.

+ The starting point of the model a0 = -156499 shows that other factors reduce the production value of 156499 billion.

+ Standard Error 182.45 is the error rate compared to the fact that we use the linear regression equation to predict. This value can be negative or positive sign, so when the symbol must add the sign. ± 182.45 to objectively describe the error of the result.

+ Multiple r = 0.871 shows that the relationship between variables is very tight.

+ R square = 0.76 shows that in the 100% change in production value, 76% fluctuations are due to variable x to 24% remaining due to other causes.

In the table Anova we have: Significance F = 0.0010 <0.05 should be able to conclude meaningful statistical data.

+ P-values of 0.0010 and 0.0011 are all significantly less than 0.05, so the two variables x and y have high value and predictive value by linear regression equation => This model is suitable.

+ Specific results as follows:

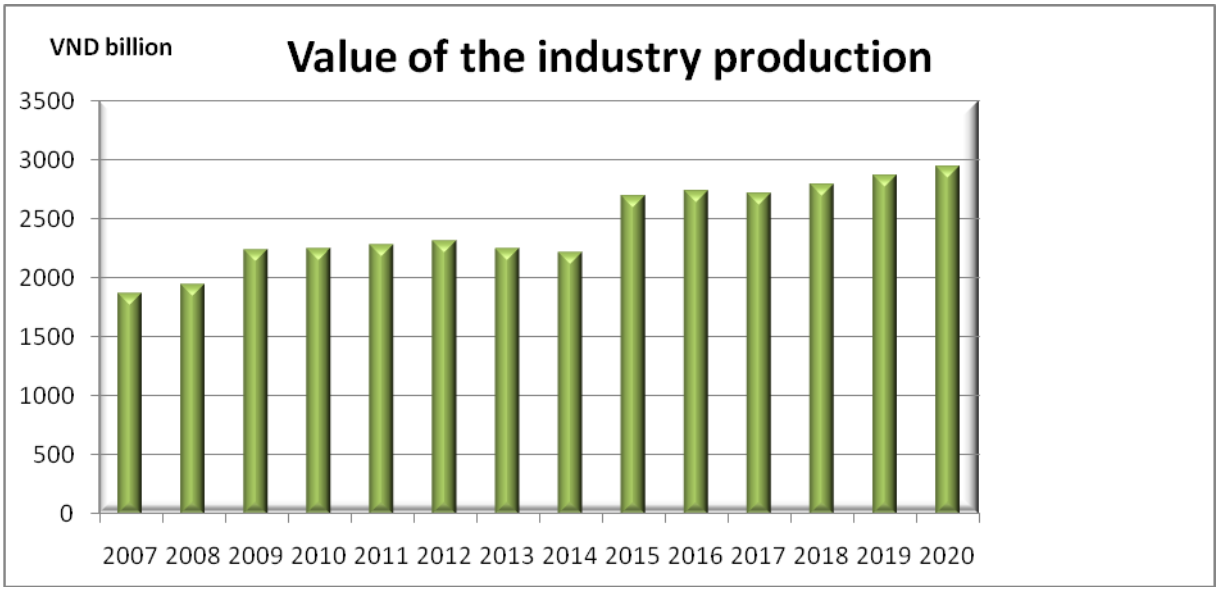

Figure 1: Forecasting results

Conclusion

Analyzing and forecasting is an important part of any business or national economic grouping, helping managers make the right decisions.

The topic of research on the industrial production value of Thai Nguyen Iron and Steel Company is a topic not only of scientific significance, but also of socio-economic significance. Collect, process, and organize data from which to examine, evaluate and analyze future economic forecasts. The paper proposes a solution to apply linear regression to the estimation of industrial production based on data collected from previous years. The paper has a great role and significance, contributing a lot of research information to managers.

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