

SCIENTIFIC METHOD ON PRODUCTION PROCESS AS AN EFFORT TO IMPROVE REAL SECTORS CONTRIBUTION TO THE INDONESIAN ECONOMY

Aris Budi Setyawan¹, Ichwan Suyudi²

¹Business and Entrepreneur Diploma Programme

²Faculty of Letters

Gunadarma University

Building 2, 2nd floor, Pondok Cina Campuss, Phone. 021-78881112 Ext. 125, 175

E-mail : arisbudi@staff.gunadarma.ac.id

ABSTRACT

Economic condition of Indonesia at presents, requires a positive contribution from all economic perpetrators in Indonesia, especially from real sectors. This sector becomes important because most company assets invested in this real sector activity, as well as the number of human resources. With this condition, this research aims at analyzing the application of scientific production method in real sector production activity, so that obtain information how far production activity conducted with scientific method, and how perpetrators concerned with this matter. This research was conducted with real sector as the sample in Depok and Bogor region. Analysis was done using descriptive and inferential analyses dealing with the data of the questionnaires administered. Temporary result shows that most respondents, although getting support from management (36%), the practice shows that not all respondents applied scientific production method in their production activity. Consequently, the production is not optimum. The cause was that technological aspect were not adequate due to the support of the management could not be fully realized. For example, less development time allocation and less supply of production technology infrastructure. In conclusion, this is quiet irony because real sectors are expected to have a positive contribution to the development of Indonesian economy, while the real condition of real sectors does not apply scientific method optimally yet.

Key words : Scientific method, Real Sector Production Activity, and Indonesian Economic

INTRODUCTION

Theoretically, to reach growth of good economics, the government of Indonesia can do various ways to reach that, one of them is pushed real sector to be able to give positive contribution to Indonesian GDP (Gross of Domestic Product). The following table shows contribution of the various sectors of the value of GDP Indonesia

Tables 1 shows, though not as high as growth of economics at a period of before crisis, but government economic recovery policy have shown results which are not good enough result, where in general, in 4 years the growth of Indonesia economics stable at 5%. However, the value of economic growth is not enough compared to inflation rate in 6%, in other word, *require more motivation to various sector;*

specially real sector. Tables 1 also shows how real sector, specially manufacturing industry, consistently has given positive contribution to Indonesian GDP as a whole.

With this important role, real sector is demanded to be able operate more optimum, more effective and efficient in its production activity. Therefore, exploiting and applying of scientific method in real sector production process, becoming important (Tersine, 1984). History has proved how industrial revolution at 18th century has given significant change for world industry growth, and in growth of him, along with sharing invention, as invention of production scientific method and machines, progressively facilitate real sector to improve effectiveness and efficiency.

Table 1. Growth of Indonesian GDP, Based on Sector Contribution

Tahun	2003	2004*	2005*	2006**				2006**
				I	II	III	IV	
Pertumbuhan (%)								
Pertanian	3,2	2,8	2,7	6,4	1,5	2,2	1,8	3,0
Pertambangan dan Penggalian	-1,4	-4,5	3,1	2,7	4,0	1,6	0,7	2,2
Industri Pengolahan	5,3	6,4	4,6	2,9	3,7	5,9	5,9	4,6
Listrik, Gas dan Air Bersih	4,9	5,3	6,3	5,1	4,5	5,8	8,1	5,9
Bangunan	6,1	7,5	7,4	7,4	8,7	9,3	10,4	9,0
Perdagangan, Hotel dan Restoran	5,4	5,7	8,4	4,4	5,5	7,5	7,0	6,1
Pengangkutan dan Komunikasi	12,2	13,4	13,0	11,5	13,3	13,6	15,9	13,6
Keuangan, Persewaan dan Jasa	7,2	7,7	6,8	5,7	5,3	4,7	6,8	5,6
Jasa-jasa	4,4	5,4	5,0	5,8	6,1	6,8	6,0	6,2
PDB	4,7	5,0	5,7	5,0	5,0	5,9	6,1	5,5
Pangsa Pertumbuhan (%)								
Pertanian	15,2	15,0	14,5	14,9	14,6	14,9	12,2	14,1
Pertambangan dan Penggalian	10,7	9,7	9,4	9,1	9,1	8,9	9,4	9,1
Industri Pengolahan	28,0	28,4	28,1	27,8	27,7	27,6	28,3	27,8
Listrik, Gas dan Air Bersih	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7
Bangunan	5,7	5,8	5,9	6,0	6,1	6,0	6,3	6,1
Perdagangan, Hotel dan Restoran	16,2	16,4	16,8	16,6	16,8	17,0	17,2	16,9
Pengangkutan dan Komunikasi	5,4	5,8	6,3	6,5	6,6	6,7	7,1	6,7
Keuangan, Persewaan dan Jasa	8,9	9,1	9,2	9,2	9,2	9,1	9,4	9,2
Jasa-jasa	9,2	9,2	9,2	9,3	9,2	9,1	9,4	9,2

Sumber: BPS

The objective of this article is to see how far scientific method applying in Indonesian real sector production activity, considering this sector is expected to become one of the backbone in improvement of growth of Indonesian economics (GDP). However, writer identifies that performance of this sector exactly not shown excellent growth yet, as noted in the manufacturing production index as follows :

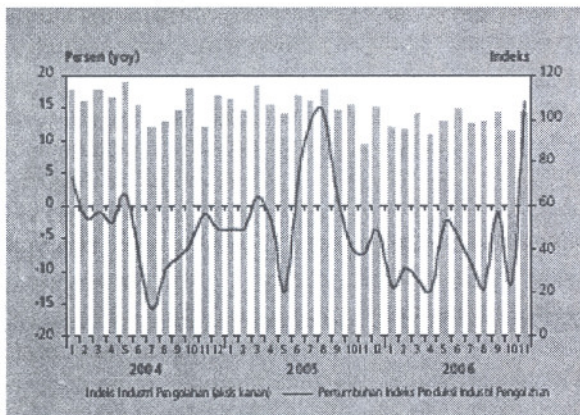


Fig 1. Growth of manufacturing Production Index

As seen at the above picture during three year later the index shows negative growth. Based on this phenomenon, the writer is interested to observe this topic. From this figure, the result

will reflect the image of hitting activity produce at the opposite of phenomenon.

In this research, real sector that the writer intends to know is manufacture industry, considering this sector has amenity for writer in measuring applying of scientific method in their production activity.

Meanwhile, scientific methods the writer employs are various scientific concept and quantitative method which explained in many production management literatures. In general this research was conducted during two periods of research. First, writer was conducted in 2000 and then it was conducted in 2007. It is of course by various adjustment needed.

THEORETICAL BACKGROUND

Production becomes a vital or importance activity of firm, because of some matters:

1. Most the public company assets of planted in production activity, specially inventory
2. Most SDM, work on production activity, and
3. Production activity are especial activity of company

Production activity can be explained as a process which chronically and effective, integrating various resources using management function to reach target (Fogary, 1989), whereas

Buffa (1991) more concern that production activity as an means to convert the input to become output.

As the growth of human needs, production activity has grown so fast. Especially

after industrial revolution at 18th century followed by inventions of scientific method of production as stated bellow.

Table 2. Growth of Production Scientific Method Invention

Year	Inventors	Scientific Methods
1881	Freederick W. Taylor	Scientific Management, Time study
1905	A.K. Erlang	Queuing Theory
1924	Walter A. Shewhart	Applying Control Map for Quality Control
1947	George B. Dantzig	Linier Programming
1957	J.E. Kelly dan M.R.	Critical Path Method (CPM)
1975	Joseph Orlick dan O. Wright	Computerize at manufacturing, scheduling, , controlling, and Material Requirement Planning (MRP)
1978	Taichi Ohno dkk di Toyota	Just in Time
Dst		

RESEARCH METHOD

Table above shows that growth of the utilization of scientific method for the activity of production keeps continued because production activity can no longer applied using traditional methods. This is due to the limited resources and also the unlimited human needs (Tersine,.....).

Effectiveness, efficiency, and optimization production activity and result can be improved by various scientific methods in production management. For example, to optimize the production rate, company can use Linear programming (Ashyari), (Herjanto, 1999). While to develop an effective and efficient production system to a production process with economic expense, the plan to relocate the expenses becomes important (Harjanto,1999), (Handoko)

By various scientific methods like forecasting of production, BEP analysis, location layout analysis, transportation method, Hungarian assignment method, queue analysis, Network analysis with CPM and PERT method, inventory control with MRP, JIT, TQM, and many more; These are believed that production activity will be more effective, efficient, and optimum.

For the inferential analysis, writer uses relation test by using coefficient of Phi, with formula:

$$\text{Phi} = \sqrt{X^2/N} \tag{1}$$

RESULT AND DISCUSSION

Descriptively, the result of this research cam be explained as the following:

First, most of the respondent profiles are manufacturing business which in the form of private sector (89,9%), corporation firm (74,6%), order base production (54,2%), local market (50,8%). The number of respondents oriented as importer is 45,8%.

Second, related to the application of scientific method in the production activity, the result which writer obtained from respondent can be seen in the table bellow :

Table 3. Implementation of Scientific Method on Production Activity

Scientific Method should be implemented	%
Production Planning	
Research and development	5
Production volume Planning	6,8
Production Forecasting	25,9

Attention of Product Life Cycle	13,6
Project and Investment Evaluation	18,6
Production Location Planning	10,2
Layout Planning	18,6
Production Process Controlling	
Production controlling	1,7
Implementation of production schedule	1,7
Using Methods in the production	22
Using Queue Method	28.8
Queue Discipline Implementation	6.8
Inventory control implementation	0
Human Resources Controlling	1,7
TQM Implementation	10,2
Maintenance implementation	3,4
Using Production Org. Structure	8,5
Scientific Method Computerization	27,1

Some of the respondents did not implement it yet. For example there are still 25,9% respondent which did not make a forecasting of production, 18,6%. The number of respondent which did not make project and investment evaluation and 13,6% getting the run around cycle live by his product. Though the number is still in minority, this matter cannot be disregarded, considering their contribution at the entire of this sector is still required

In general, this is due to the inexistence of expense, time and infrastructure (30,5%), lack of top management support management (25,4%), likely do not 100% earning realization in field.

If seen from attitude and perception of production manager to matters related to the application of scientific method in production activity, the result can be shown as follows:

Though most respondents have used scientific method in his production activity.

Table 4. Production Manager Perception

The aspects addressed	% Answers				
	AD	NA	N	A	AA
There are top management support on production process	3.4		1.7	61	33,9
There are quick response from management			5.1	61	33.9
Clearly reward and support from management		5.1	11.9	69.5	13.6
There are support from the other management function	1.7	1.7	1.7	72.9	22
Need coordination among management function			3.4	45.8	50.8
There are important to keep input from customer		1.7		35.6	62.7
Production HR are good specification	3.4	8.5	13.6	62.7	11.9
Production HR have the right man on the right place		5.1	18.6	66.1	10.2
Scientific Method of production is most important to optimization production activity	1.7	1.7	15.3	66.1	15.3
Production concept at present time has due	1.7	1.7	18.6	67.8	10.2
Production technology applied has due	1.7	5.1	13.6	66.1	13.6
Technology will adverse Human Resources	1.7	61	15.3	20.3	1.7
There are need fund allocation to production process		1.7	8.5	66.1	23.7
Fund allocation has been adequate		6.8	22	62.7	8.5
At present, firm has used qualified input		6.8	5.1	71.2	16.9

AD: Absolutely Disagree; NA: Disagree; N: Neutral; A: Agree; AA: Absolutely Agree

The Above table shows that most respondents agree that production activity has been conducted by applying of scientific method, like existence of management support, including the usage of technology supporting, and available fund allocation. Nevertheless, there are some

respondents do not agree with the response mentioned.

To get detail information from this research, writer has conducted a relation test among variables in questionnaire. For example, according to the explanation above, some reasons

why the respondents did not apply scientific method in the production activity are inexistence of fund, time and infrastructure, and lack of top management support.

For example, to know the application of scientific method in forecasting and project or investment evaluation, there is a relation between with variables. This is due to the respondents did not apply yet scientific method in the production activity. The writer conducted some relation tests with result as follows :

Relation management support variable test with Forecasting variable.

Symmetric Measures

	Value	Approx. Sig
Nominal by Phi	.619	.035
Nominal Cramer's V	.438	.035
N of Valid Cases	58	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assumir hypothesis.

Relation management support variable test with Project / investment evaluation variable.

Symmetric Measures

	Value	pprox. Sig
Nominal by Phi	.644	.434
Nominal Cramer's V	.372	.434
N of Valid Cases	59	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assum hypothesis.

Relation Fund variable test with Forecasting variable

Symmetric Measures

	Value	Approx. Sig
Nominal by Phi	.809	.004
Nominal Cramer's V	.467	.004
N of Valid Cases	58	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming hypothesis.

Relation Fund variable test with Project/ investment Evaluation variable

Symmetric Measures

	Value	Approx. Sig
Nominal by Phi	.827	.020
Nominal Cramer's V	.477	.020
N of Valid Cases	59	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assumir hypothesis.

From the above table, there is inconsistency relation of management support variable with applying of scientific method in forecasting aspect (value of Phi shows there is a significant relation) and project evaluation (value of Phi shows there is well relation but not significant), this indicates that not all management supports can be applied in field. Meanwhile the problem of fund available, result shows consistently that there is strong relation between available fund allocation variable by applying scientific method in production activity, especially in the case of production forecasting and Project evaluation.

CONCLUSION

In general, the real sector production activity represented by respondent in this research has applied various scientific methods in his production activity. There are few of respondents in this sector did not conduct it yet. Looking at the contribution of this sector at Indonesian economic, this phenomenon requires a solution so that all respondents in this sector can give better contribution, passing applying of scientific method in his production activity.

Some methods can be done such as improving management support realization in field and providing fund allocation for applying and development of scientific method in production activity.

Another method can be done is conducting socialization to respondents, improving of HR quality as one of the production input, passing better formal education process, trainings, and also the make-up of awareness of management culminate to give more attention to the problem of exploiting of scientific method in their production activity. Above all, it is expected that, as a whole, this sector can give good and

progressive economic contribution to reach a better growth in Indonesia economy.

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