

# PRODUCTIVITY MEASUREMENT USING COMPASS

2nd June – 3rd June 2004

Organised by:

National Productivity Corporation (NPC)

(Statutory Body Under Ministry of International Trade and Industry - MITI)

[www.npc.org.my](http://www.npc.org.my)



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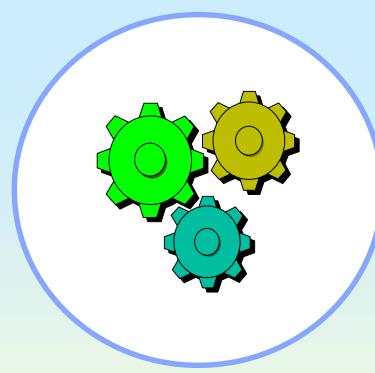




## Miss. Nor Aini Abd Talib

- BA (Hons) Economics (UKM)
- MSc in Productivity and Quality Enhancement (UKM)
- She has been with NPC for the last 11 years
- Experience in conducting Productivity Measurement Programme for the last 8 years.
- Auditor for National Productivity Award (NPC) organised by NPC and Quality Management Excellence Award (QMEA) ,
- Attended Special programme on Measuring Productivity for Public Sector conducted by BLS, USA





# PRODUCTIVITY : PRINCIPLES AND CONCEPT



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# WHAT IS PRODUCTIVITY?

$$\textit{Productivity} = \frac{\text{Output}}{\text{Input}}$$

**Output** : **Goods & Services**

**Input** : **Resources Used**

**Productivity is a measure of efficiency in the use of inputs or resources in relation to its outputs**



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# MEASURES OF OUTPUT

- Production Quantity
- Monetary Value of Production
- Added Value



# MEASURES OF INPUT

- Number of employees
- Personnel Expenses
- Total Manhours Worked
- Materials
- Energy



# QUALITATIVE ASPECTS OF PRODUCTIVITY

- Better quality of life
- An attitude of mind
- Wealth distribution



**AN ATTITUDE OF  
HEART THAT  
STRIVES FOR AND  
ACHIEVES THE  
HABIT FOR  
IMPROVEMENT**



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# In Our Work

- Timeliness
- Q System
- Management and work method
- Cost reduction
- Technology



# WHAT PRODUCTIVITY IS NOT.....

- Productivity is not equivalent to production
- Productivity is not a mere pursuit of efficiency
- Productivity is not equivalent to profitability



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# Why Productivity is Not .....

## 1. Productivity is not equivalent to production

- ❑ Production refers to total output produced
- ❑ Productivity refers to total amount of output produced per unit of input used
- ❑ An increased in production does not necessary mean increase in productivity



# PRODUCTIVITY IS NOT EQUIVALENT TO PRODUCTION



2002

Output = RM20 000  
Productivity = RM20 000 for 5 workers  
= RM4 000 per workers



2003

Output = RM30 000  
Productivity = RM30 000 for 10 workers  
= RM3 000 perworkers



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# Why Productivity is Not .....

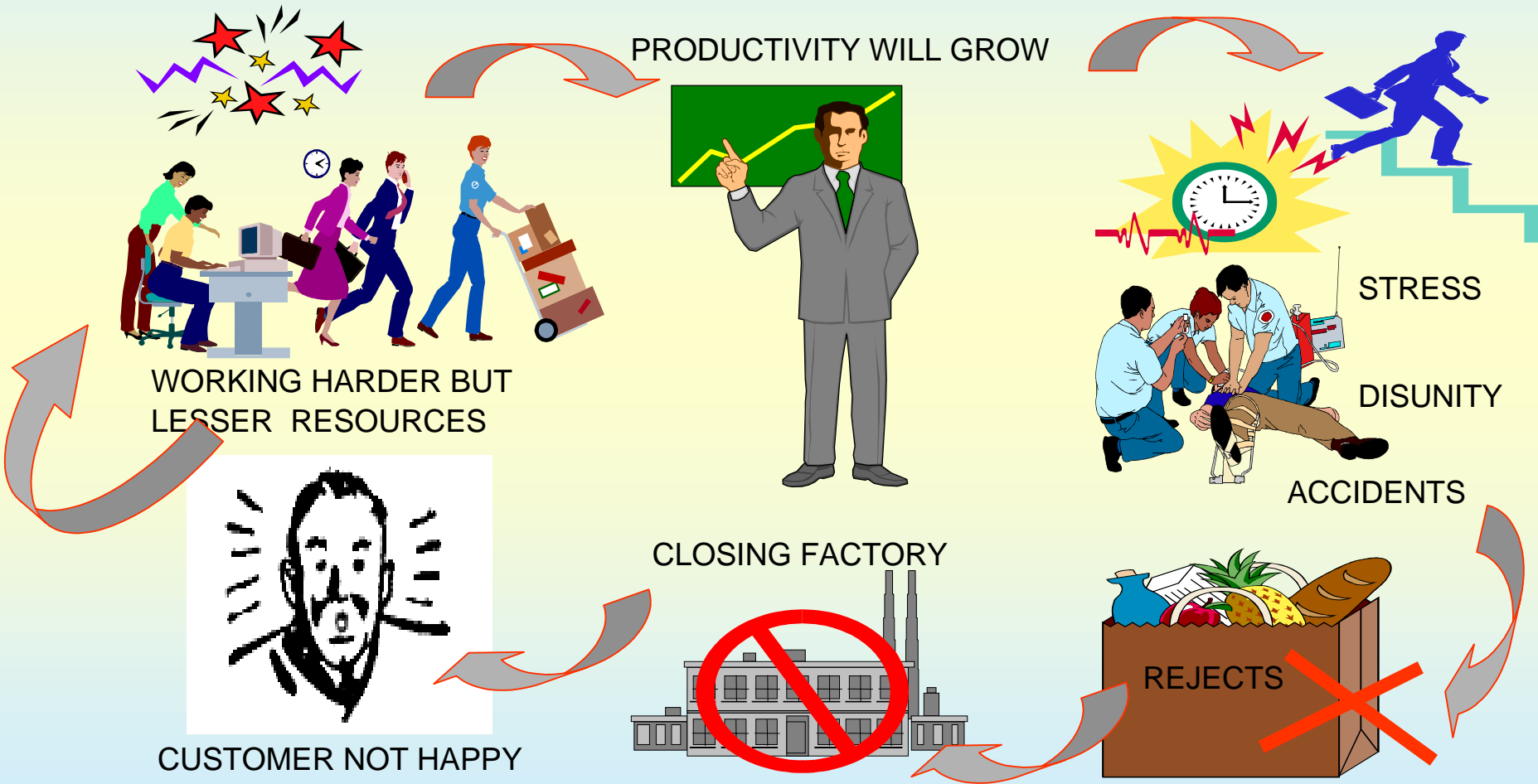
## 2. Productivity is not a mere pursuit of efficiency

### Misconception:

- To improve productivity - manager may pressure the employees to work hard or retrench some of them to minimise input factor
- A company/organisation cannot be considered productive if it produces the highest number of goods in the shortest length of time but has its goods rejected by the customers.



# PRODUCTIVITY IS NOT A MERE PURSUIT OF EFFICIENCY



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### 3. PRODUCTIVITY VS PROFITABILITY

#### PROFITABILITY

Measures whether gross margins adequately cover cost

#### PRODUCTIVITY

Tells whether an operation is efficient and effective

#### PROFITABILITY

Measures today's financial standing ( short-term )

#### PRODUCTIVITY

Measures tomorrow's position ( Long-term )

$PRODUCTIVITY = EFFICIENCY + EFFECTIVENESS$

= Doing things right + Doing the right things



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# PRODUCTIVITY : A MEASURE OF...

**PRODUCTIVITY = EFFICIENCY + EFFECTIVENESS**

**DO THING  
RIGHT**

**DOING THE RIGHT  
THINGS**

Productivity

= Efficiency + Effectiveness

= Doing things right + Doing the right things



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# EFFICIENCY

- THE RATIO OF ACTUAL OUTPUT ATTAINED TO STANDARD OUTPUT EXPECTED.

Actual/Target

Time

Cost



# EFFECTIVENESS

- THE DEGREE OF ACCOMPLISHMENT OF OBJECTIVES.



# PRODUCTIVITY

- **PRODUCTIVITY – THE RELATIONSHIP BETWEEN WHAT COMES OUT OF THE ORGANISATIONAL SYSTEM, IN TERMS OF QUALITY PRODUCTS AND SERVICES THAT SATISFY HUMAN NEED**
- **WHAT GOES INTO THE ORGANISATIONAL SYSTEM IN TERMS OF RESOURCES CONSUME TO GENERATE THOSE PRODUCTS AND SERVICES.**
- **HAS THE MOST PROFOUND INFLUENCE ON LONG RUN ORGANISATIONAL PERFORMANCE**



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# PRODUCTIVITY FRAMEWORK

Better Quality of Life

Higher Standard of Living

Higher Gross Domestic Product

Increase in  
Employment

Higher  
Productivity

Higher Capital  
Intensity

Higher Total Factor  
Productivity

Quality of  
Workforce

Quality of Capital  
& Systems

Quantitative Inputs

Qualitative Inputs

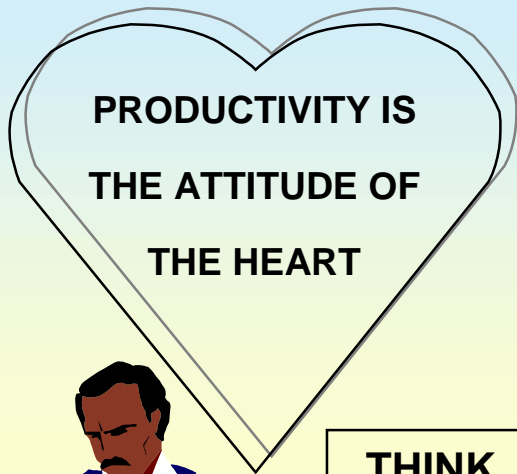
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**PRODUCTIVITY = EFFICIENCY X EFFECTIVENESS**

**DOING THE  
THING RIGHT**

**DOING THE  
RIGHT THING**



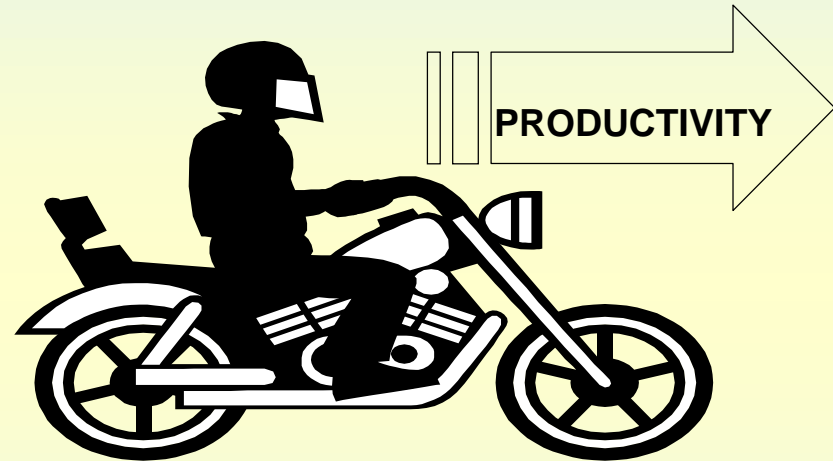
**PRODUCTIVITY IS  
THE ATTITUDE OF  
THE HEART**



**THINK**

**FEEL**

**DO**



**ABLE**

**WILLING**

NOT ABLE X

WILLING

ABLE X

NOT WILLING

NOT ABLE X

NOT WILLING

ABLE X

WILLING



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**PRODUCTIVITY  
IS  
DOING BETTER  
TODAY THAN  
YESTERDAY  
AND  
DOING BETTER  
TOMORROW  
THAN TODAY**

**WORK  
SMARTER  
NOT  
HARDER**

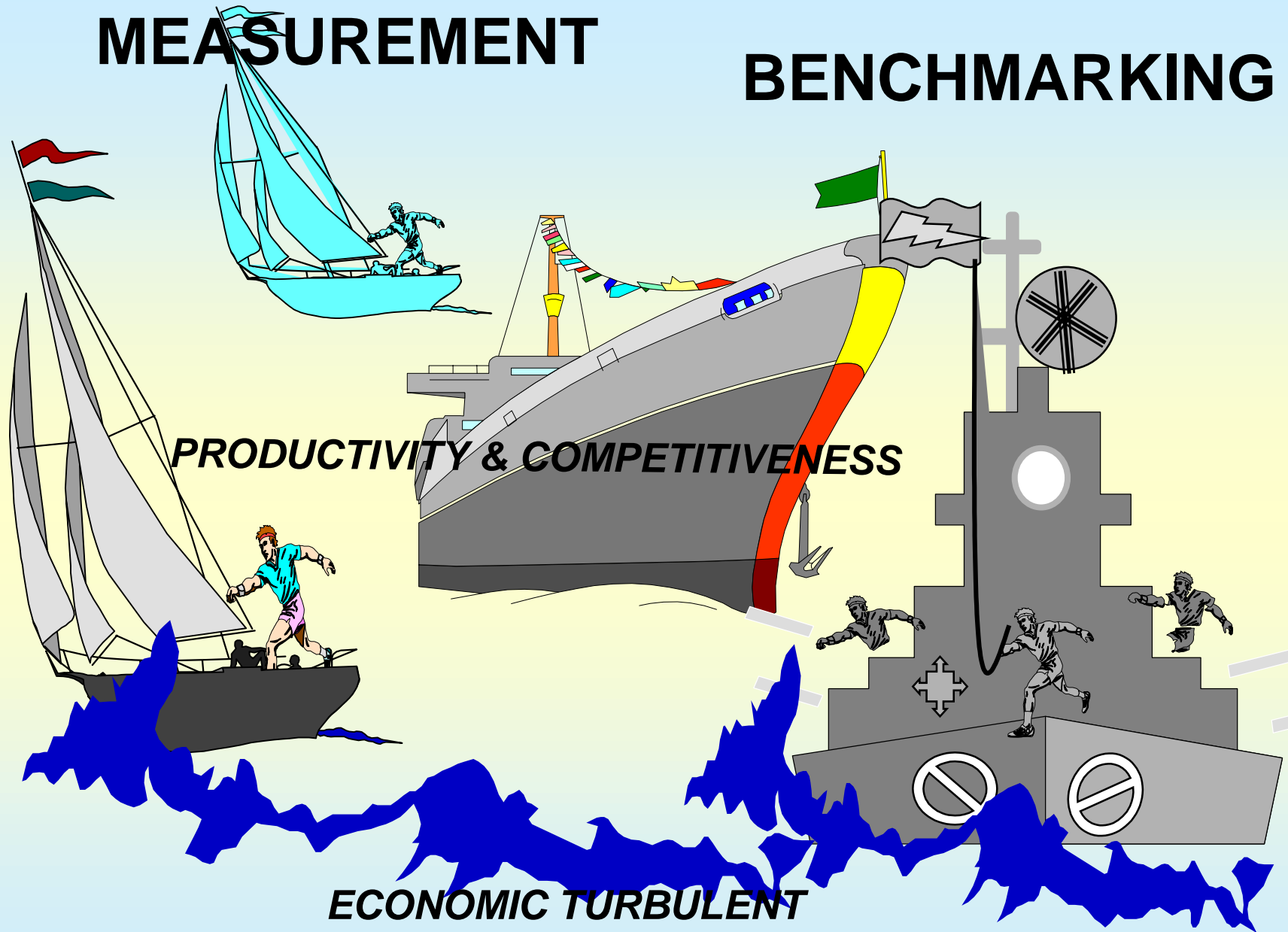


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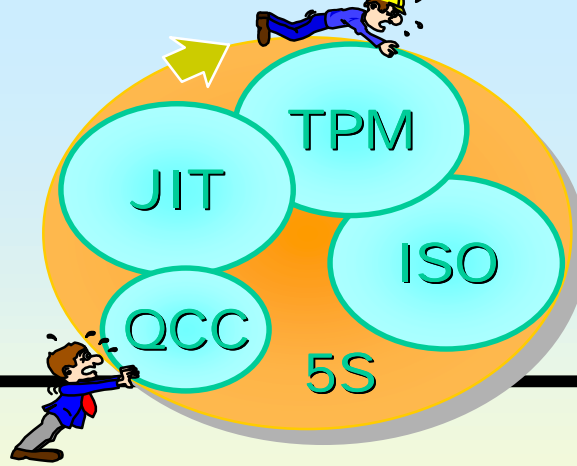


# MEASUREMENT

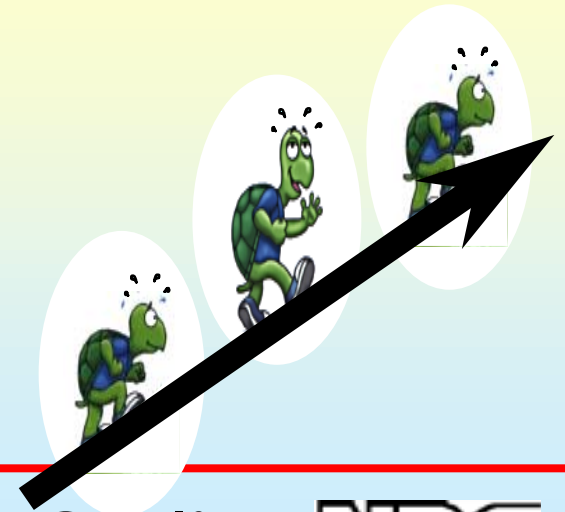
# BENCHMARKING



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# MANAGING PRODUCTIVITY



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# EVALUATING CORPORATE PERFORMANCE

**If You Cannot Measure Productivity  
You Cannot Manage Productivity**

**Measurement is a natural part of the analysis, control, evaluation and management process. A manager must measure productivity to improve it.**

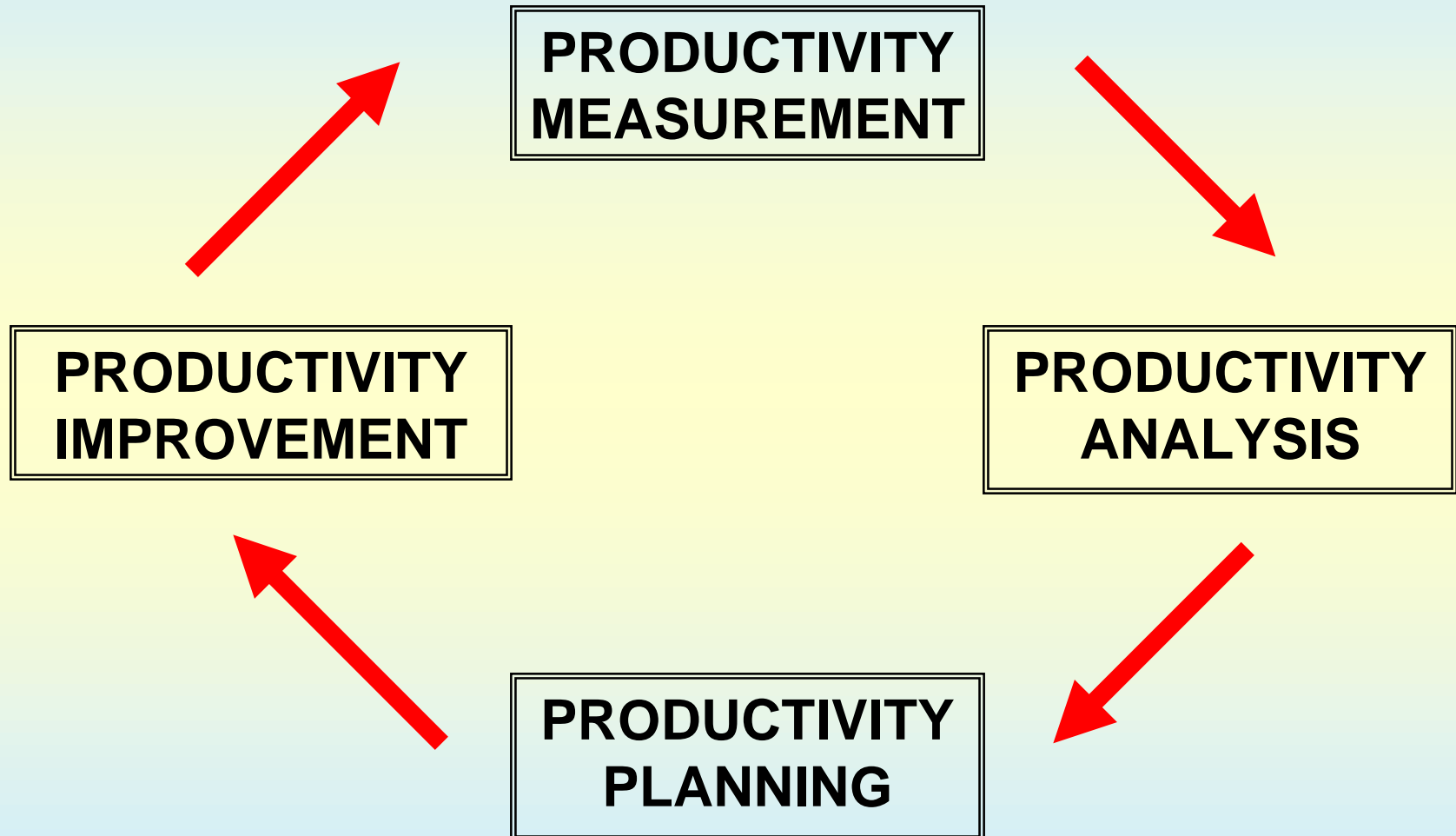


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# MANAGING PRODUCTIVITY

Productivity management is a continuous process involving 4 important phases as shown in the following diagram.



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# PRODUCTIVITY MEASUREMENT HELPS YOU TO :



- Know where you are
- Set targets to reach your destination
- Identify the potential obstacles
- Inspire others to work with you to reach your destination ( You have to focus their attention on the priorities)

## Based on past experienced uses of PM

- Look at the past status/performance
- Present status
- Decision making
- Benchmark
- Policy making
- Forecasting.



A sound measurement is one which:

- Tells you whether your productivity strategies are resulting in any real improvement
- Is well –understood by everyone
- Covers all resources and processes
- Includes indicators of current and future performance and reinforces the links between them.



# TYPES OF PRODUCTIVITY MEASUREMENT

❖ PARTIAL PRODUCTIVITY

❖ MULTIFACTOR PRODUCTIVITY OR  
TOTAL FACTOR PRODUCTIVITY



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# PARTIAL PRODUCTIVITY

TOTAL OUTPUT

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INPUT 1



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# MULTI FACTOR/TOTAL FACTOR PRODUCTIVITY

TOTAL OUTPUT

-----

INPUT 1 + INPUT 2



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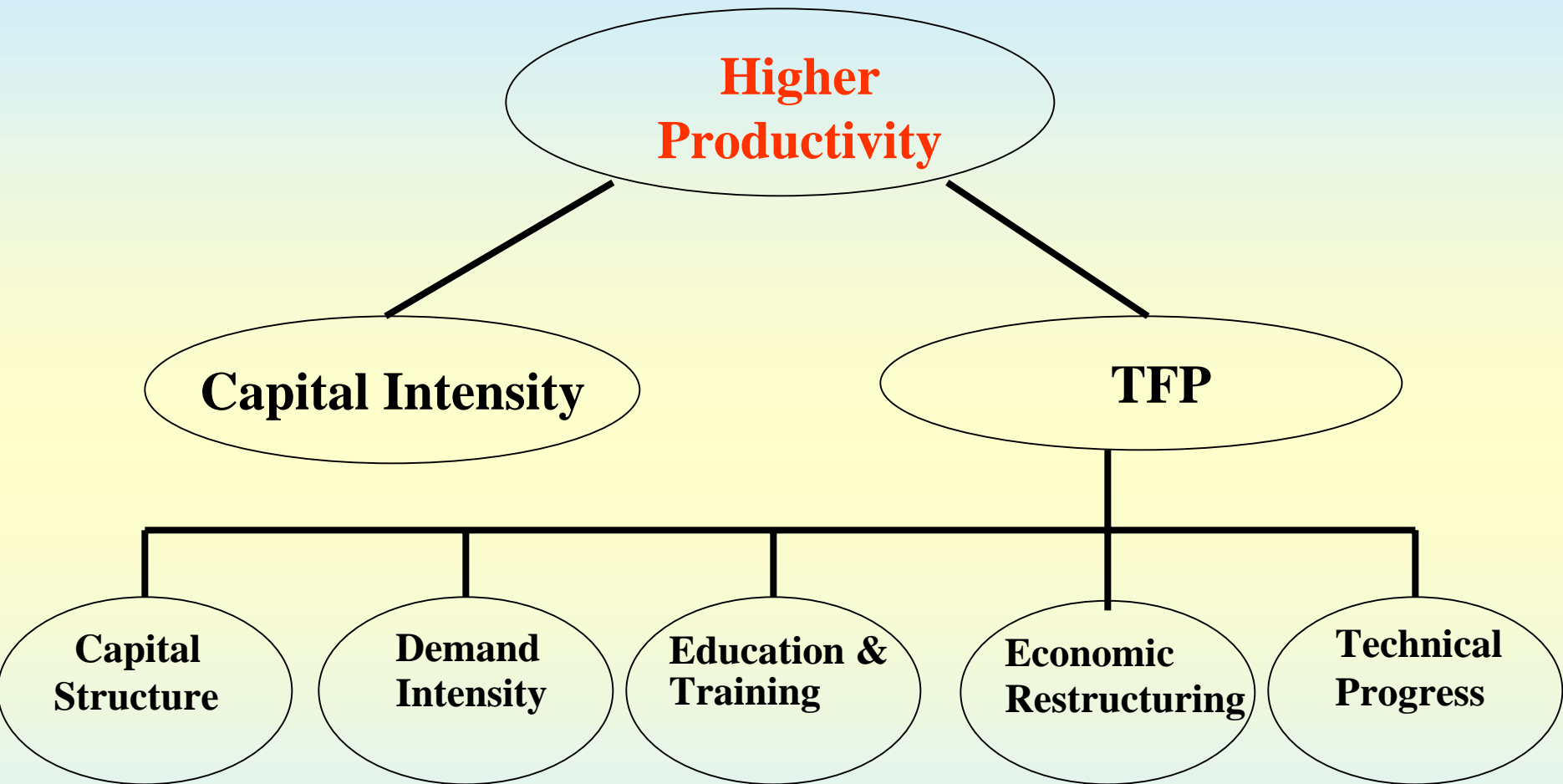


# WHAT IS TFP

- TFP is an overall measure of productivity that reflects the impact of qualitative improvement in manpower and capital resources.



# Contribution of CI and TFP to the Higher Productivity



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# Sources of Technical Progress

## WORKFORCE

Positive quality culture  
High team spirits  
Multi-skilling  
Better communication  
Good health

High quality machinery &  
equipment capabilities

## CAPITAL

## SYSTEMS

Leadership style  
Best management practices  
Information technology  
Easy access to information  
Performance measurement

Technology utilisation  
Innovation  
Research & development

## TECHNOLOGY



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# PRODUCTIVITY MEASUREMENT

- **Measure the productivity level and productivity growth rate.**
- **Determine the productivity position for comparison.**
- **Added value productivity measurement is conducted with financial information.**



# PRODUCTIVITY ANALYSIS

- **Defines the strengths and weaknesses by analysing productivity issues and productivity gap.**
- **Locates the causes for the weaknesses.**
- **Search for the key to productivity improvement**



# PRODUCTIVITY ANALYSIS

USE REAL VALUES OR SHOW 'TRUE FIGURE'

'REAL FIGURE ARE FREE FROM PRICE  
CHANGES THAT AFFECT MONEY VALUES

Nominal Value/Terms: At current price

Real Value/Terms: At constant price



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# EVALUTING PRODUCTIVITY

**ADDED VALUE**

**PRODUCTIVITY RATIOS**

**PRODUCTIVITY STANDARDS**

**PRODUCTIVITY PATTERNS  
OVER TIME**



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# PRODUCTIVITY PLANNING

- **Setting of productivity improvement targets**
- **Drafting of alternative plans**
- **Determination of final plan**
- **Appointment of department in charge**



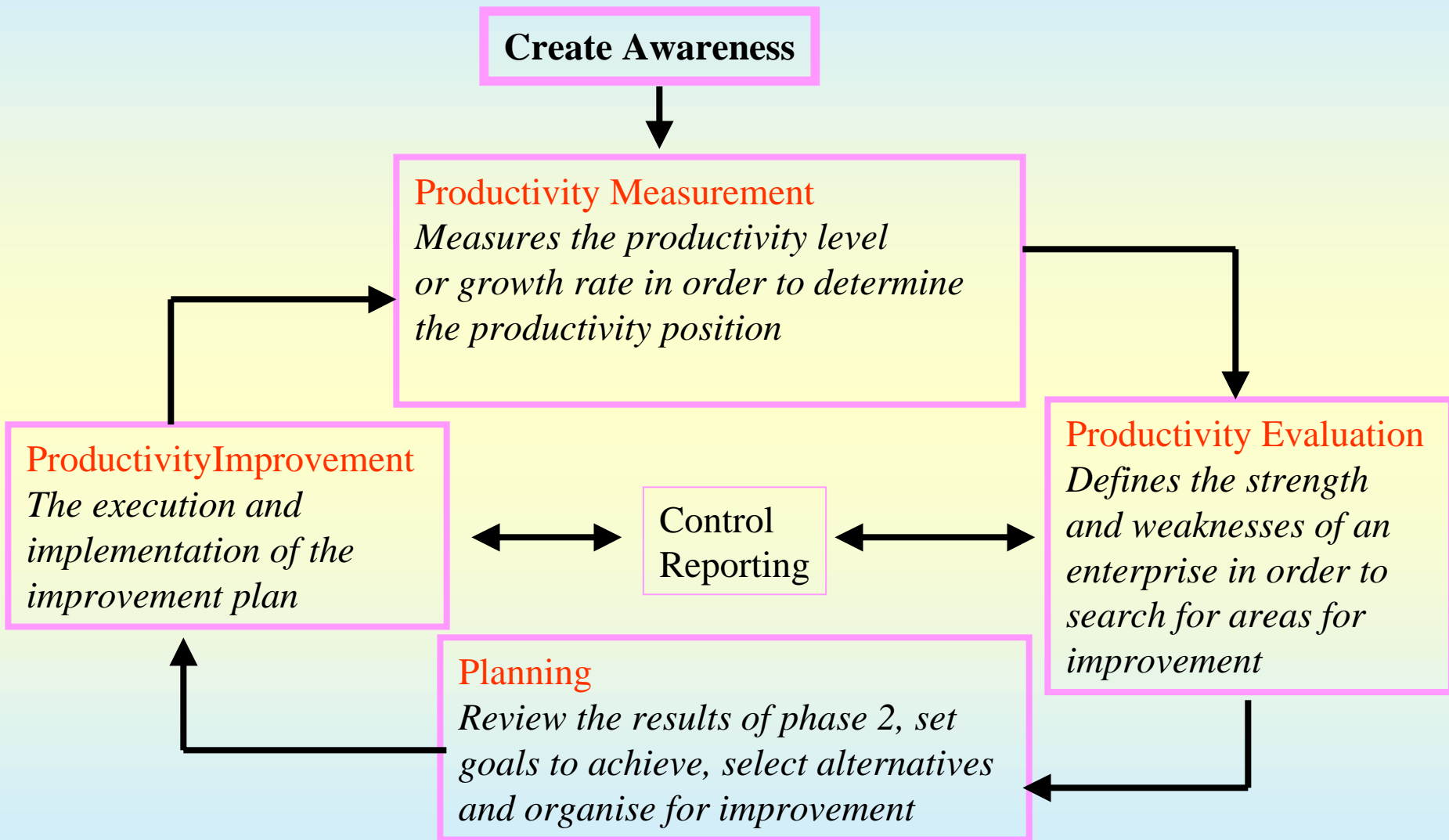


# PRODUCTIVITY IMPROVEMENT

- **Monitor and feedback to the first process in order to analyse the deviation of the results from plans.**
- **Continuous activities forming a loop.**



# BASIC MODEL OF PRODUCTIVITY MANAGEMENT



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# Questions to ask in managing productivity????

- **Given our strategy, WHAT ARE THE MOST IMPORTANT MEASURES OF PERFORMANCE?**
- **How do these measures relate to one another?**
- **What measures truly predict long-term financial success in our business?**



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# WHERE DO WE WANT TO BE?

- Higher business profitability and growth
- Cost competitiveness
- Attract and retain motivated and productive workforce
- Better standard of living
- High quality of work life



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# HOW DO WE GO THERE?

- ✓ **Productivity through expansion of added value**
- ✓ **Labour Share of added value**
- ✓ **Profit-wage relationship**
- ✓ **Overall wage increase in the economy**
- ✓ **Educating and preparing workers for new economic activities**



# WAYS OF IMPROVING PRODUCTIVITY

① REDUCE COSTS

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OUTPUT

INPUT



② MANAGE GROWTH

---

OUTPUT

INPUT



③ WORK SMARTER

---

OUTPUT

INPUT

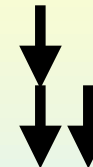


④ PARE DOWN

---

OUTPUT

INPUT



⑤ WORK EFFECTIVELY

---

OUTPUT

INPUT



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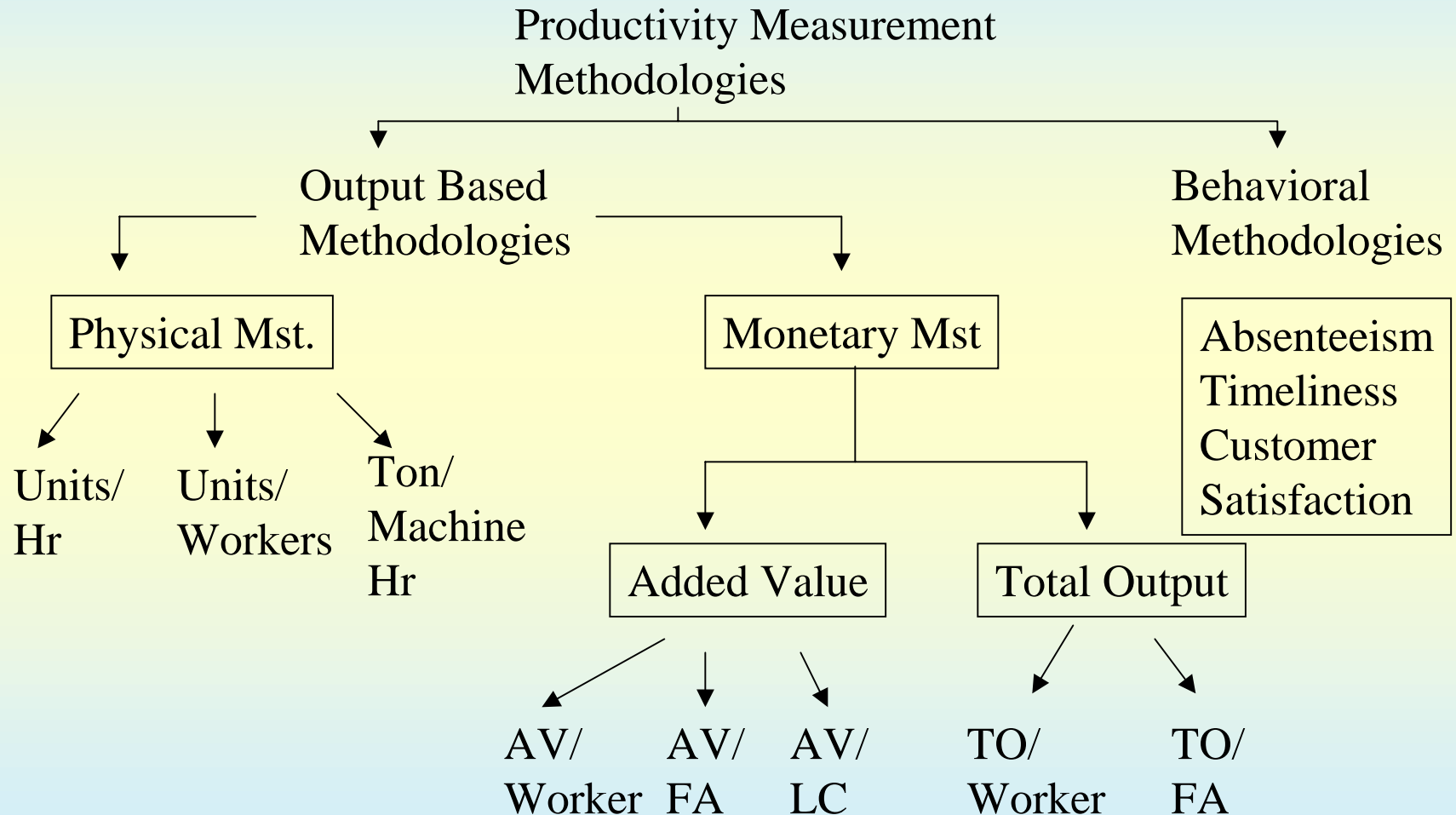
# **ADDED VALUE CONCEPT IN MEASURING PRODUCTIVITY**



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# PRODUCTIVITY MEASUREMENT METHODOLOGIES



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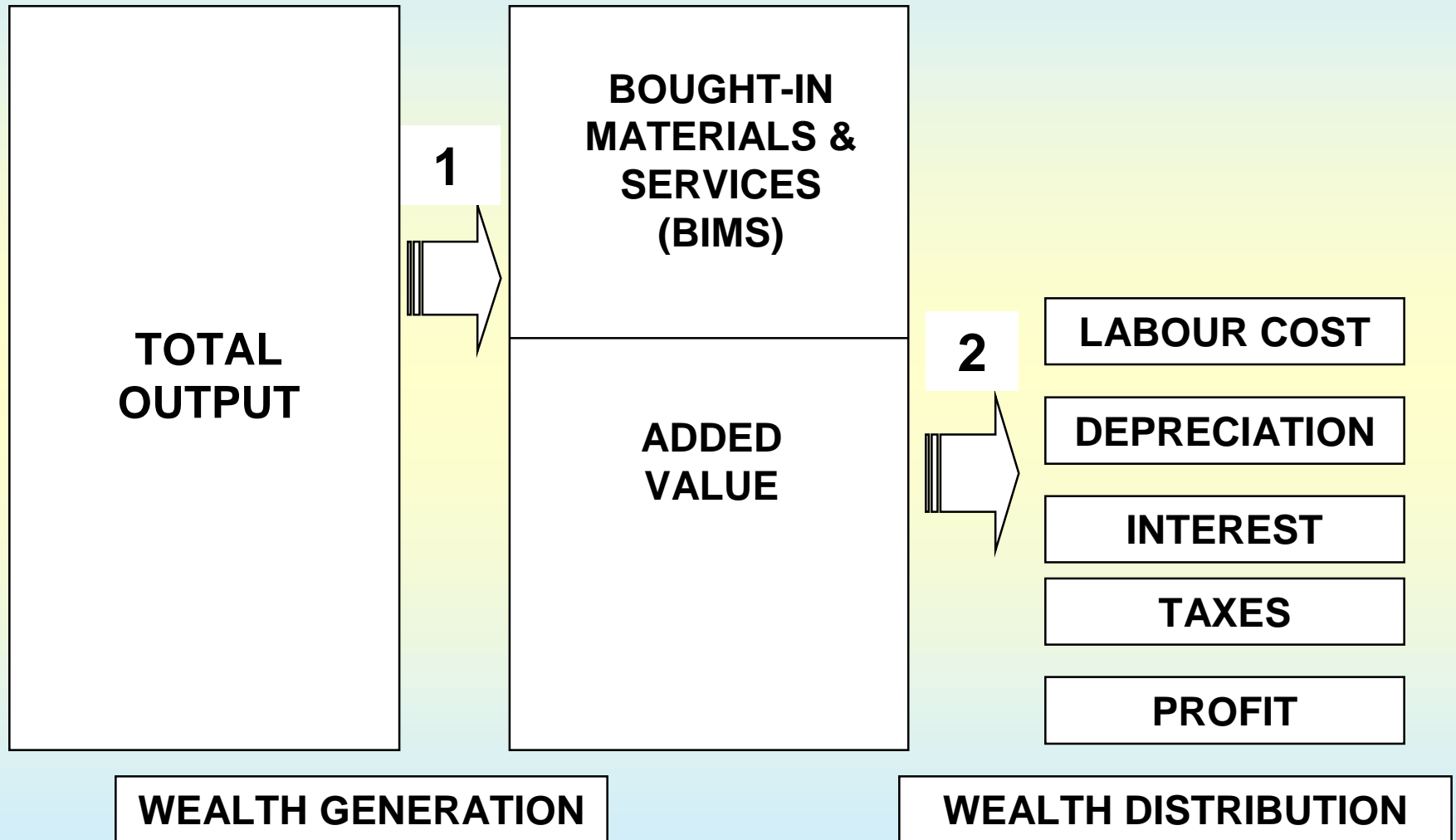


# WHAT IS ADDED VALUE ?

- Added Value measures the wealth created by the collective efforts of those who work in an enterprise (namely employees) and those who provide the capital (namely, investors and shareholders).
- This Added Value will be distributed back to the :
- EMPLOYEES (Salary and Wages) ,
- FIXED ASSETS (Depreciation),
- FINANCIAL INSTITUTION (Interest and charges),
- GOVERNMENT (Indirect taxes)
- SHAREHOLDERS (Profit/ dividends)



# ADDED VALUE



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# Added Value Computation

1. Subtraction Method:  
( wealth generation approach)

$$\text{Added Value} = \text{Total Output} - \text{BIMS}$$

2. Addition Method:  
( wealth distribution approach)

$$\text{Added Value} = \text{Labour Cost} + \text{Depreciation} + \text{Indirect Taxes} + \text{Interest} + \text{Operating Profit}$$



# 1. WEALTH GENERATION APPROACH

**ADDED VALUE = TO *less* BIMS**

*This approach is useful in assessing the efficiency of the enterprise. It indicates how much added value can be generated by producing more output efficiently and by being more efficient in using BIMS.*



# TOTAL OUTPUT

<b>Components of Total Output</b>	
<b>1. NET SALES</b>	<b>Net Sales: Gross sales less discounts less returns less rebates.</b>
<b>2. CLOSING STOCKS OF FINISHED GOODS LESS OPENING STOCKS OF FINISHED GOODS</b>	
<b>3. WORK-IN-PROGRESS (CLOSING) LESS WORK-IN-PROCESS (OPENING)</b>	
<b>4. OWN CONSTRUCTION</b>	<b>Own construction is a total cost paid for any internal activity/project carried out by own resources for improvements/enhancement objective. Example: up-grading of tools for molding activity.</b>



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<b>Components of Total Output</b>	
<b>5. INCOME FROM SALES OF GOODS PURCHASED IN SAME CONDITION</b>	<b>Example: Company XYZ is a tyre manufacturer but at the same time it acts as an agent for other tyre manufacturers and sells them in same condition to its clients.</b>
<b>6. INCOME FROM SERVICES RENDERED</b>	<b>The type of services rendered should be related to main activity of company as listed in the company's memorandum of association.</b>



# **BOUGHT-IN MATERIALS & SERVICES (BIMS)**

 **BIMS is defined as all materials and services purchased by enterprise**

**Example:**

-  – Materials consumed
- Utilities (water, electrical and fuel)
- Payment for contractors

# BOUGHT-IN MATERIALS AND SERVICES (BIMS)

## Components of BIMS

<b>1. MATERIALS CONSUMED</b>	
<b>2. SUPPLIES, CONSUMABLES, PRINTING AND LUBRICANTS</b>	<p><b>Supplies:</b> all related supplies such as stationery, packaging materials, accessories, tools, parts for repairs and maintenance etc.</p> <p><b>Consumables:</b> all related items consumed in a production process.</p>
<b>3. UTILITIES</b>	<b>Water and Electricity .</b>
<b>4. PAYMENT TO CONTRACTORS</b>	<b>Payment for sub-contracting work.</b>



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## Components of BIMS

**5. PAYMENT FOR INDUSTRIAL WORK DONE BY OTHERS AND STORES & SUPPLIES**

**Example: Payment for maintenance of parts & machinery and payment for storage of materials or purchased goods.**

**6. PAYMENT FOR NON-INDUSTRIAL SERVICES**

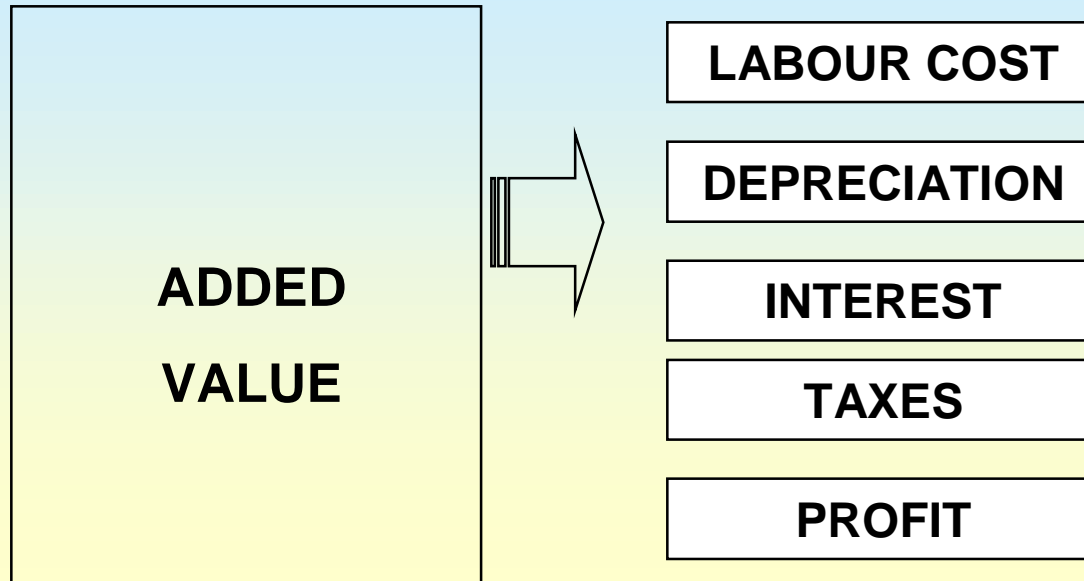
**Example: Acquisition of trade-mark & patent, payment for royalties, advertising fees, audit fees, legal fees, professional charges, postage, consultancy fees etc.**



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## 2. WEALTH DISTRIBUTION APPROACH



*This approach shows how rewards for the employee, returns to the investors and capital providers are linked to the success of the enterprise. This helps to encourage participation by all parties in improving the performance of the enterprise.*



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# LABOUR COST(AV)

- 😊 SALARIES AND WAGES  
(INCLUDING COMMISSIONS,  
BONUSES AND BENEFITS)
- 😊 EPF/SOCSSO PAID BY EMPLOYERS
- 😊 MEDICAL EXPENSES
- 😊 SEMINAR & TRAINING
- 😊 OTHER FRINGE BENEFITS  
(FOOD & WEARING APPAREL)



# DEPRECIATION (AV):

😊 **DEPRECIATION FOR FIXED  
ASSETS EXCLUDING LAND  
AND BUILDING**



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# INTEREST ON BORROWINGS(AV)

- 😊 INTERESTS ON SHORT-TERM AND LONG-TERM BORROWING
- 😊 HIRE PURCHASE INTERESTS
- 😊 INTERESTS ON FIXED LOAN
- 😊 INTERESTS ON OVERDRAFT

# INDIRECT TAXES & LEVIES (AV)



**QUIT RENT**



**PROPERTY ASSESSMENT**



**STAMP DUTIES**



**ROAD TAX**



**FOREIGN WORKERS LEVIES**



**OTHER TAXES AND LEVIES**



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# **OPERATING PROFIT**

**CALCULATED**

**PROFIT ARISING FROM THEIR**

**OPERATING ACTIVITIES OF THE**

**ENTERPRISE, THAT IS,**

**EXCLUDING INCOME/LOSS FROM**

**INVESTMENT, PROFIT/LOSS FROM**

**SALES OF FIXED ASSETS, ETC.**



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# NON-OPERATING INCOMES (NOI)



NOI is defined as income derived from side activity (non-operating activity) of the company

Example:

- Interest received
- Rent received
- Gain on investment
- Gain on foreign exchange transaction
- Gain on sale of properties
- Gain on sale of stock and bond
- Other income on transaction of non operating nature



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# NON-OPERATING EXPENSES (NOE)



NOE is defined as all expenses / losses on transaction of non-operating in nature



Example:

- **Bad debt**
- **Loss of sale of properties**
- **Loss on investment**
- **Stock written-off**
- **Loss on FOREX**
- **Penalty charges**

# FORMAT ADDED VALUE STATEMENT

## Subtraction Method

Total Output(TO) -

XXXX

Bought In Material & Services (BIMS)

XXXX

Added Value

XXXX

## Addition Method

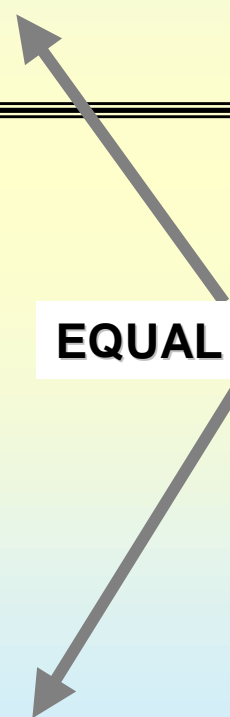
+ Labour Cost  
+ Depreciation  
+ Interest  
+ Indirect taxes  
+ Operating Profit

+ XXX  
+ XXX  
+ XX  
+ XX  
+ XXXX

Added Value

XXXX

EQUAL AMOUNT



# EXAMPLE OF ADDED VALUE CALCULATION

<b>Subtraction Method</b> (\$)		<b>Addition Method</b> (\$)	
<b>Total output</b>	<b>103.9</b>	<b>Labour Cost</b>	<b>25.9</b>
<b>Less: BIMS</b>	<b>67.6</b>	<b>Interest</b>	<b>0.8</b>
		<b>Indirect Taxes</b>	<b>3.9</b>
		<b>Depreciation</b>	<b>2.9</b>
		<b>Operating Profit</b>	<b>2.8</b>
<b>Added Value</b>	<b><u>36.30</u></b>	<b>Added Value</b>	<b><u>36.30</u></b>



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# ADDED VALUE ANALYSIS

- 🔗 How an enterprise creates wealth
- 🔗 How an enterprise distributes wealth
- 🔗 Assesses efficiency/productivity
- 🔗 Shows the way to
  - Reduce waste of all forms
  - More efficient utilization of labour and capital
  
- 🔗 Links up success to rewards
- 🔗 Motivates participation for higher productivity
- 🔗 Win-win strategy



# WELCOME TO NPC'S

## COMPANY MANUAL FOR PRODUCTIVITY ASSESSMENT



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# CONTENTS OF CD COMPASS

## PART 1:

- INTRODUCTION TO PRODUCTIVITY
- PRODUCTIVITY MEASUREMENT
- THE ADDED VALUE CONCEPT
- DEFINITION AND TERMINOLOGY
- INTERPRETATION OF PRODUCTIVITY RATIOS
- LINKAGES AMONG PRODUCTIVITY RATIOS

## PART II: COMPASS SOFTWARE





# STEPS IN USING COMPASS SOFTWARE



- PREPARATION OF FINANCIAL STATEMENT
- IDENTIFY ITEMS IN P&L ACCOUNT AND MANUFACTURING ACCOUNT (*NOT APPLICABLE FOR SERVICE INDUSTRY*) ACCORDING TO ADDED VALUE, BIMS, NOE AND NOI
- TRANSFER SUM OF THE IDENTIFIED ITEMS IN COMPASS'S SOFTWARE WORKSHEET.

COMPLETING THE WORKSHEET DATA WHICH IS DIVIDED INTO 3 FRAMES :

1. Profit and Loss Account
  2. Manufacturing Account
  3. Balance Sheet
- CHECK INTEGRITY OF DATA ENTERED.
  - OUTPUT OF COMPANY PERFORMANCE RATIO



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	A	B	C	D	E	F	G	H	I	
1			<b>PRODUCTIVITY AWARD 2003 ( PART 1)</b>							
2	<b>Company :</b> _____									
3										
4										
5		<b>COMPETTIVENESS</b>		2000	2001	2002	GR2001	GR2002		
6	1	Labour Cost Competitiveness	AV/LC				#DIV/0!	#DIV/0!		
7	2	Labour Cost per Employee	LCE				#DIV/0!	#DIV/0!		
8	3	Unit Labour Cost	LC/TO				#DIV/0!	#DIV/0!		
9	4	% Labour Cost in Total Input	LC/TI*100				0.00	0.00		
10		<b>LABOUR PRODUCTIVITY</b>								
11	5	Labour Productivity	AV/Employee				#DIV/0!	#DIV/0!		
12	6	Total Output per Employee	TO/Employee				#DIV/0!	#DIV/0!		
13		<b>CAPITAL PRODUCTIVITY</b>								
14	7	Capital Productivity	AV/FA				#DIV/0!	#DIV/0!		
15	8	Capital Turnover	TO/FA				#DIV/0!	#DIV/0!		
16	9	Capital Intensity	FA/Employee				#DIV/0!	#DIV/0!		
17		<b>PROCESS EFFICIENCY(PE)</b>								
18	10	Process Efficiency(PE)	AV/(TI-BIMS)				#DIV/0!	#DIV/0!		
19		<b>BUSINESS RETURN &amp; PROFITABILITY</b>								
20	11	Profitability	OP/ TO *100				0.00	0.00		
21	12	ROA= % Oper. Profit over FA	OP/ FA *100				0.00	0.00		
22	13	TPM = Total Productivity Measure	TO/TI				#DIV/0!	#DIV/0!		
23		<b>COMPONENT OF TOTAL INPUT RATIOS</b>								
24	14	% Materials Consumed	MC/TI*100				0.00	0.00		
25	15	% Depreciation	Depreciation / TI *100				0.00	0.00		



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# Demo on CD COMPASS

## **‘Computation of Productivity Ratios Using COMPASS Software’**



# PRODUCTIVITY RATIOS



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# PRODUCTIVITY AND ADDED VALUE

- Added Value : Most frequently used indicator
- Labour Productivity =  $\frac{\text{Added Value}}{\text{Employee}}$
- Capital Productivity =  $\frac{\text{Added Value}}{\text{Fixed Asset}}$
- Labour Cost Competitiveness =  $\frac{\text{Added Value}}{\text{Labour Cost}}$



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Group A,B, C, D....



# COMPETITIVENESS

## LABOUR COST COMPETITIVENESS (ADDED VALUE PER LABOUR COST (AV/LC))

Added Value per Labour Cost measures how much added value is produced by each unit of labour cost.

Added value generated per ringgit of labour cost that we spent.

The higher the ratio, the more competitive is the industry in terms of labour cost.

A low ratio implies low level of productivity or high labour cost unmatched by productivity growth

e.g 2001 : 1.69

2002 : 2.39

2003 : 2.50

1

Every RM 1.00 that we paid to workers they are able to generate how much AV



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Group A,B, C, D....



# COMPETITIVENESS

## LABOUR COST PER EMPLOYEE (LC/E)

Labour Cost per Employee measures the average wage rate per employee

High ratio means high returns to individual workers and vice-versa

e.g 2001 : RM 20,678.54 (RM1,723.21)  
2002 : RM 22,932.47 (RM 1,911.04)  
2003 : RM 25,959.88 (RM 2,163.32)

2



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Group A,B, C, D....



# COMPETITIVENESS

## UNIT LABOUR COST (LC/TO)

Proportion of labour cost to total output

Unit Labour Cost measures the labour cost incurred in producing one ringgit worth of output per employee

A high ratio indicates high labour cost which could be due to labour scarcity and high labour turnover. It could also be due to a lack of skilled labour or poor labour mix

e.g 2001 : 0.24 (Cost 24 cent)  
2002 : 0.39 (Cost 39 cent)  
2003 : 0.20 (Cost 20 cent)

3



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Group A,B, C, D....



# COMPETITIVENESS

**% LABOUR COST IN TOTAL INPUT (LC/TI \* 100)**

A mount of labour cost as a percentage in total input

High ratio indicates a large portion of labour cost in total input that may be due to :

- Employment of skilled workers
- Excessive overtime
- Rework
- High labour intensity

e.g 2001 : 35%  
2002 : 29 %  
2003 : 25 %

4



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# HIGH LABOUR COST PER EMPLOYEE

## POSSIBLE CAUSES

- ✓ **Low labour productivity**
- ✓ **Poor work assignment and scheduling**
- ✓ **Excessive overtime work**
- ✓ **Improper use of personal capabilities**
- ✓ **Lack of supervision**

## FURTHER ANALYSIS SUGGESTED

- 📖 **Labour cost competitiveness**
- 📖 **Audit work scheduling method**
- 📖 **Overtime records vs workload**
- 📖 **Worker morale survey**
- 📖 **Supervisory performance audit**





# GUIDELINES TO MEASURE LABOUR COST COMPETITIVENESS

1.  $AV/LC$  must be positive ( +ve )
2.  $LC/E$  must be lower than  $AV/E$
3. Unit Labour Cost should have a declining trend



Group A,B, C, D....



# LABOUR PRODUCTIVITY

## ADDED VALUE PER EMPLOYEE (AV/E)

Reflects the amount of wealth created by company relative to the number of employee it has .

e.g 2003 : RM 10,871.29  
2002 : RM 9,905.85

### High Ratio

Management Efficiency  
Work Attitudes  
Demand for the product  
Price effect

### Low Ratio

High BIGS  
Wastage of time and materials  
Inadequate salary/wage rates

5



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# LOW ADDED VALUE PER EMPLOYEE

## POSSIBLE CAUSES

- ✿ High BIMS
- ✿ Poor production scheduling
- ✿ Single skill workers
- ✿ Inefficient work methods
- ✿ Reworking and redoing
- ✿ Wastages of time and services
- ✿ Lack of worker training
- ✿ Low worker morale
- ✿ Inadequate salary / wage system

## FURTHER ANALYSIS SUGGESTED

- ✿ Added Value to sales ratio
- ✿ Work sampling study
- ✿ Worker flexibility study
- ✿ Method and time study by sampling
- ✿ Review of quality check sheets
- ✿ Review of services reports
- ✿ Training need study
- ✿ Worker morale survey
- ✿ Review of wage system





# TOTAL OUTPUT PER EMPLOYEE

## TOTAL OUTPUT PER EMPLOYEE (TO/E)

The sizes of output generated by each employee of the enterprise.

e.g      2002 : RM 20,485.15  
          2003: RM 25,500.71

Gives an indication of efficiency and/or marketing capability

A high ratio reflects a good marketing strategy adopted by the enterprise.

A low ratio indicates:

- Deliberate business policy of having low turnover
- Low product profiles and quality

6



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# TOTAL OUTPUT PER EMPLOYEE

## POSSIBLE CAUSES

- Low services turnover
- Over-staffing
- Low labour productivity
- Low worker morale

## FURTHER ANALYSIS SUGGESTED

- ➡ Breakeven analysis
- ➡ Organisation / method study
- ➡ Added Value per worker
- ➡ Worker morale surveys



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# CAPITAL PRODUCTIVITY

## ADDED VALUE PER FIXED ASSET (AV/FA)

Added Value generated per ringgit of fixed asset (Pure Number)

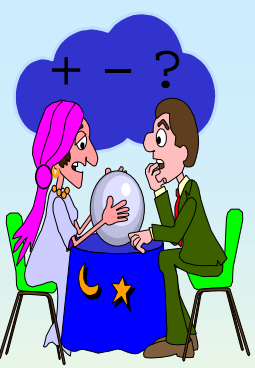
e.g. 2002: 1.203 : RM 1 spent on FA only generate 1.20

2003: 0.337 : RM 1 spent on FA only generate 0.34

Indicates the degree of utilisation of tangible fixed asset.

High Ratio indicates the efficiency of asset utilisation.

Low Ratio reflects poor asset utilisation.



# CAPITAL TURNOVER

## TOTAL OUTPUT PER FIXED ASSET( TO/FA)

Total output created per ringgit of fixed asset invest (Pure Number)

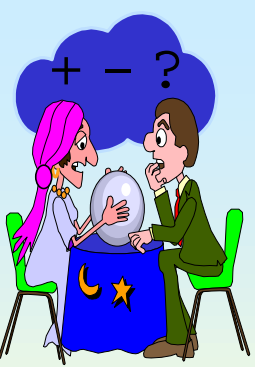
e.g. 2002: 2.267 : RM 1 spent on FA , TO generate 2.27

2003: 3.030 : RM 1 spent on FA , TO generate 3.030

This ratio measure the efficiency in capital utilisation and/or marketing system .

A high ratio indicates efficiency in capital utilisation and good marketing system.

A low ratio means low turnover of materials, high work-in-progress of fixed asset.



# CAPITAL INTENSITY

## FIXED ASSET PER EMPLOYEE (FA/E)

Amount of Fixed Asset allocated to each employee (RM)

e.g. 2002: RM 9,037.97

2003: RM 8,415.12

This ratio indicates whether an enterprise is relatively capital intensive or labour intensive

(Adopts a capital-intensive or labour-intensive policy)

A high ratio indicates the high capital intensity.

A low ratio means

- Dependence on labour-intensive methods
- Low technological inputs



# PROCESS EFFICIENCY (PE)

- $$\begin{aligned} PE &= \frac{[TO - BIMS]}{[TI - BIMS]} \\ &= \frac{AV}{[TI - BIMS]} \end{aligned}$$

- PE ratio indicates the efficiency and effectiveness of the process, which is normally affected by production techniques used, technological innovation, managerial and labour skills

## INDICATORS

### PROFITABILITY

$$\frac{\text{Operating Profit}}{\text{Total Output}} \times 100\%$$

## WHAT IT TELLS

This ratio reflects the proportion of operating profit in total output

A high ratio indicates that the enterprise is getting high returns

A low ratio normally implies high cost

## INDICATORS

Business returns

RETURN ON ASSETS (ROA)

Operating Profit X 100%  
Fixed Assets

## WHAT IT TELLS

This ratio indicates the return of fixed assets of an enterprise

High ratio indicates high returns on investment in fixed assets and vice-versa

## INDICATORS

**Business returns**

**TOTAL PRODUCTIVITY  
MEASURE (TPM)**

**Total Output**

**Total Input**

## WHAT IT TELLS

**This ratio indicates the return amount of total output generated by each unit of input**

**A high ratio indicates a better performance of the enterprise and vice-versa**

13



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## INDICATORS

### Components of Total Input

#### 1. % Material Consumed

$$\frac{\text{Material Consumed} \times 100\%}{\text{Total Input}}$$

## WHAT IT TELLS

This ratio indicates the amount of materials consumed as a percentage in total input

High ratio indicates a large portion of materials consumed in total input.

A high ratio reflects small added value content and vice-versa

## INDICATORS

### Components of Total Input

#### 2. % Depreciation

$$\frac{\text{Depreciation}}{\text{Total Input}} \times 100\%$$

## WHAT IT TELLS

This ratio indicates the amount of depreciation as a percentage in total input

High ratio indicates a large portion of depreciation in total input cost. This ratio also indicates high capital intensity and / or new additional/substitution of assets and vice-versa

## INDICATORS

### Components of Total Input

#### 3. % Utilities

$$\frac{\text{Utilities}}{\text{Total Input}} \times 100\%$$

## WHAT IT TELLS

This ratio indicates the amount of utilities as a percentage in total input

High ratio indicates a large portion of utilities cost in total input and vice-versa

## INDICATORS

### Components of Total Input

#### 4. % Other Cost

$$\frac{\text{Other Costs}}{\text{Total Input}} \times 100\%$$

## WHAT IT TELLS

This ratio indicates the amount of other costs as a percentage of total input incurred other than labour, materials, depreciation and utilities

A high ratio indicates a large portion of other costs incurred in total input and vice-versa



## INDICATORS

Other Ratio Related to Productivity

### 1. Labour Share in Added Value

**Labour Cost X 100%**  
**Added value**

## WHAT IT TELLS

This ratio indicates the proportion of added value which is allocated to labour costs.

A high ratio may be the results of high wage rates or labour intensity and may also means low capital utilisation and vice-versa.

18



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## INDICATORS

Other Ratio Related to Productivity

### 2. Operating Profit Share in Added Value

Operating Profit X 100%  
Added value

## WHAT IT TELLS

This ratio indicates the proportion of operating profit in added value .

A high ratio is attributed to high output revenue and vice-versa.

19



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## INDICATORS

Other Ratio Related to Productivity

### 3. % of Material Consumed in Total Output

**Material Consumed X 100%**  
**Total Output**

## WHAT IT TELLS

This ratio indicates the amount of material consumed in generating the output of an enterprise .

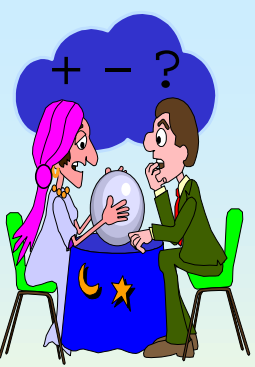
A high ratio means high material consumption and vice-versa.

20



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# ADDED VALUE CONTENT

## ✿ 4. ADDED VALUE / TOTAL OUTPUT \* 100

This ratio can be used to gauge the degree of utilisation of BIG S, and changes in the price differentials between products and purchases.

A high ratio indicates efficient usage of purchase or favourable price differentials.

A low ratio means

- High cost of BIGS ( Value analysis)
- Poor services quality ( QC System audit by sampling)
- Low price competition (Service features audit by sampling)

## INDICATORS

Other Ratio Related to Productivity

### 5. Added value per operating Capital

Added Value  
Operating Capital

22

## WHAT IT TELLS

Indicates how intensively capital is used e.g degree of FA utilisation, control of stock level and debt level and efficiency of cash management.

A high ratio indicates efficient management of capital.

A low ratio reflects poor capital utilisation.



## INDICATORS

Other Ratio Related to Productivity

### 6. Capital Share in Added Value

$$\frac{\text{Capital Cost (Dep)}}{\text{Added value}} \times 100$$

## WHAT IT TELLS

This ratio indicates the proportion of capital costs in added value

A high ratio indicates an inclination towards high capital intensity and vice-versa.

23



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## INDICATORS

Other Ratio Related to Productivity

### 7. % Material Consumed of Added Value

**Material Consumed X 100**  
**Added value**

## WHAT IT TELLS

This ratio indicates the amount of material consumed in creating the added value of an enterprise.

A high ratio means high materials consumption in creating added value of an enterprise and vice-versa.

24



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## INDICATORS

Other Ratio Related to Productivity

### 8. System Conversion Efficiency

Throughput

Total Input- Material Consumed

## WHAT IT TELLS

This ratio indicates the efficiency of the conversion system, usually the production system.

A high ratio indicates an efficient conversion system and vice -versa.

25



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## INDICATORS

Other Ratio Related to Productivity

### 9. Throughput Ratio

Throughput

Total Manufacturing Cost

## WHAT IT TELLS

This ratio indicates the generation of output by the production system.

A high ratio indicates the effectiveness of the production system and vice-versa.

26



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## INDICATORS

Other Ratio Related to Productivity

### 10. Competitive Edge Ratio

Throughput

Total Manufacturing Cost +  
Work -in-Progress (WIP)

27

## WHAT IT TELLS

This ratio indicates the generation of output by the production system ,including work in-progress.

A high ratio indicates good production management.

A low ratio indicates poor production planning and control.



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## INDICATORS

Other Ratio Related to Productivity

### 11. Material Turnover

Total Output

Materials Consumed

28

## WHAT IT TELLS

This ratio indicates the adequate production method / system ,purchasing system and inventory control system of an enterprise.

A high ratio means adequate production,purchasing and inventory control system of the enterprise and low wastage of materials due to good quality work and vice-versa.



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# PRODUCTIVITY LINKAGES



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# Productivity Linkages - Competitiveness

Ratio	Growth	What is Tells
Added Value per Labour Cost		
Labour Cost Per Employee		
Unit Labour Cost		
Added Value per Employee		

**Overall analyses that tell this companies is ???**



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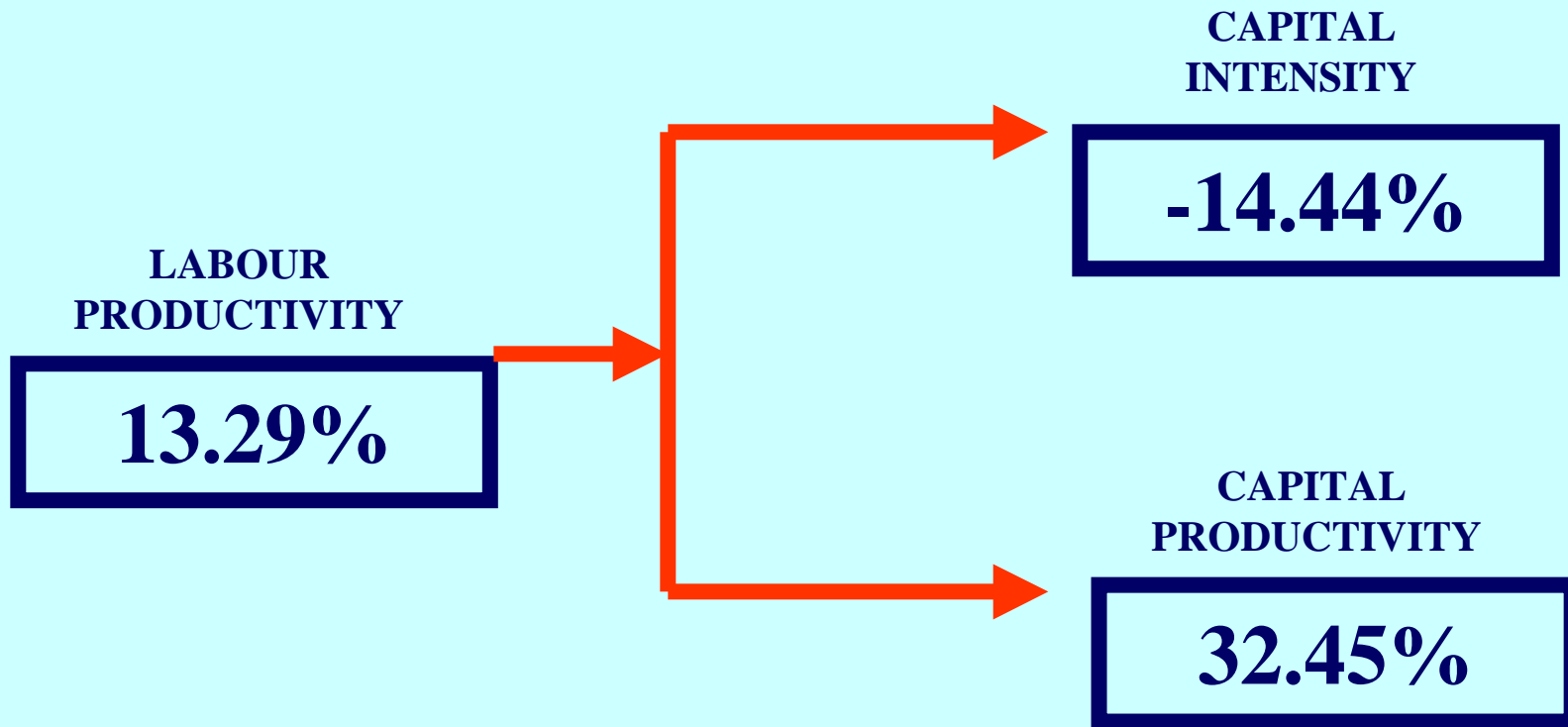


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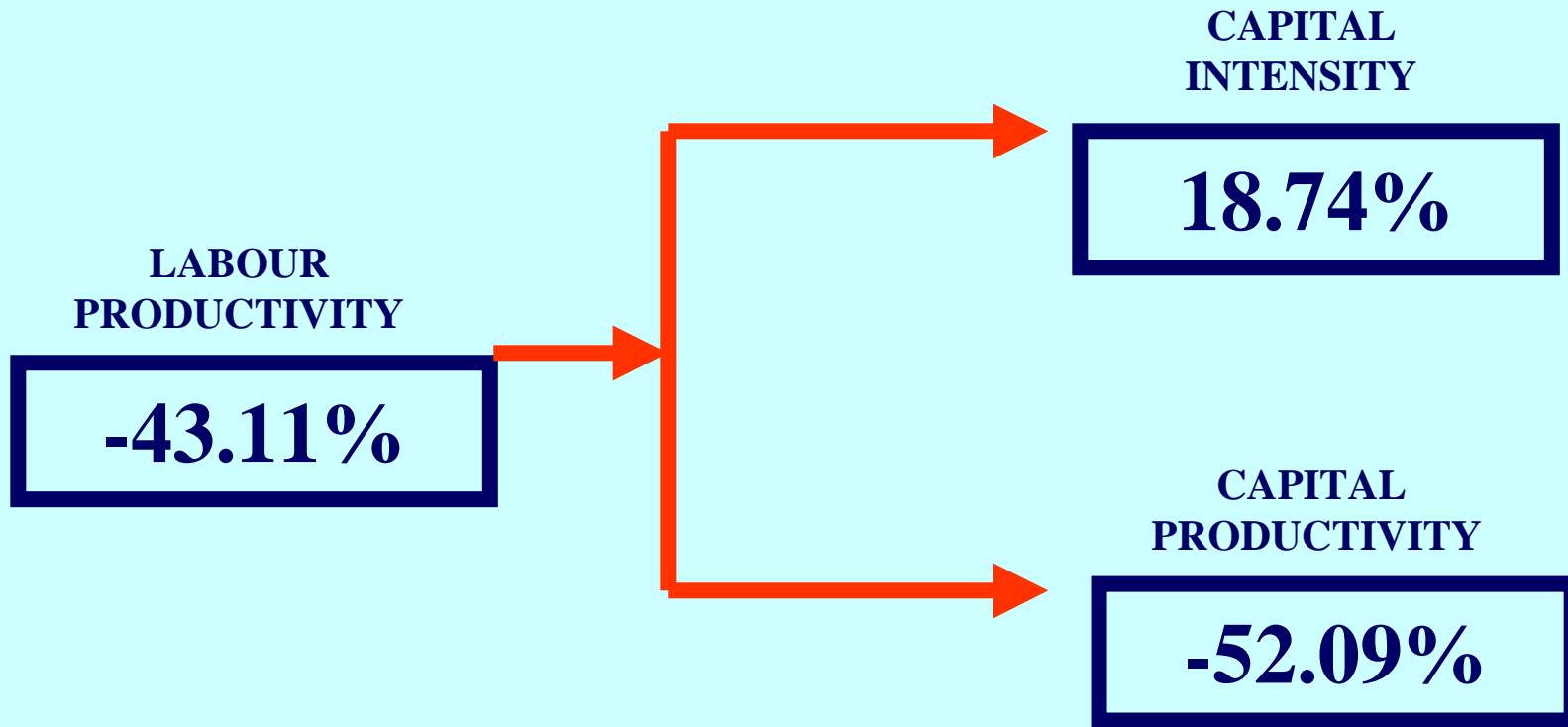
# PRODUCTIVITY LINKAGES ANALYSIS



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# PRODUCTIVITY LINKAGES ANALYSIS



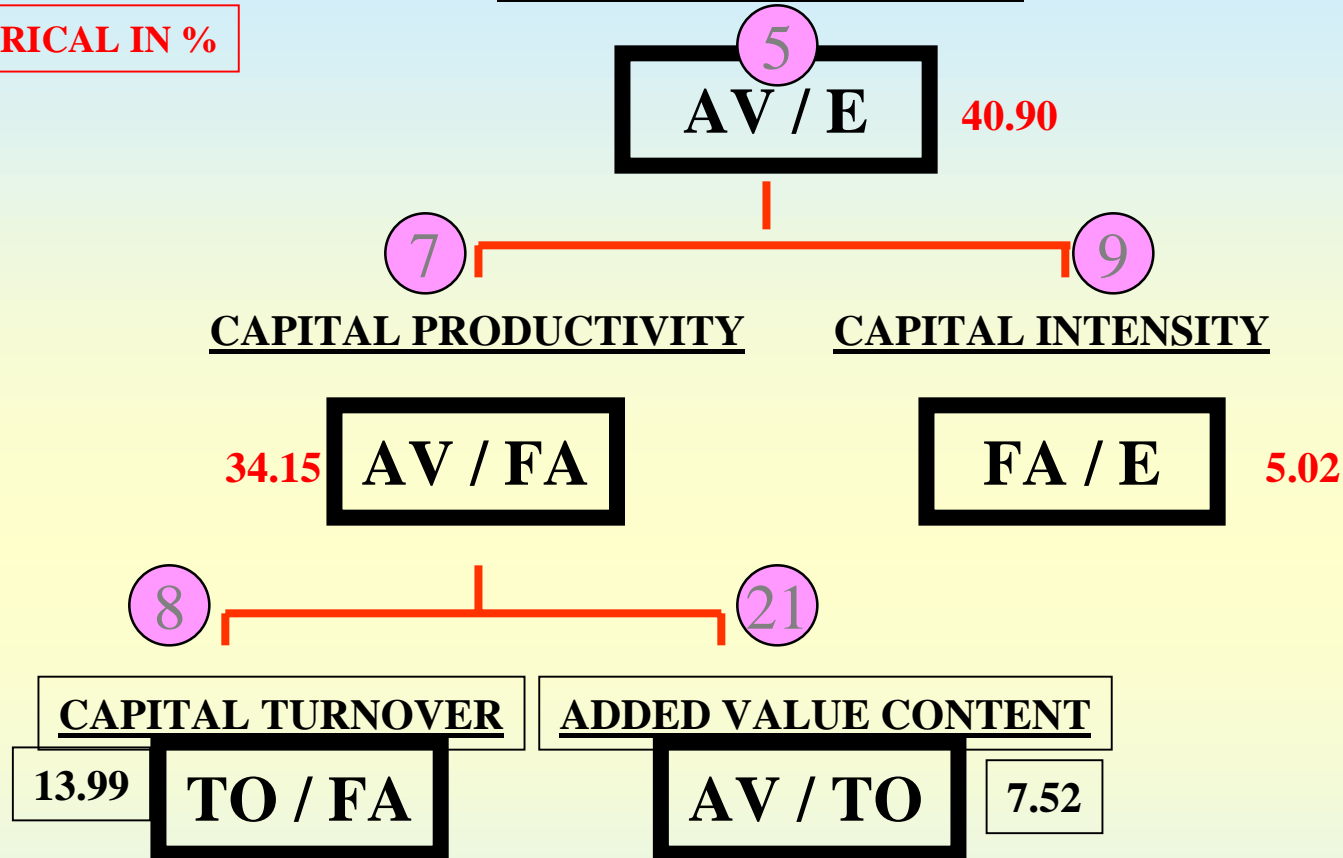
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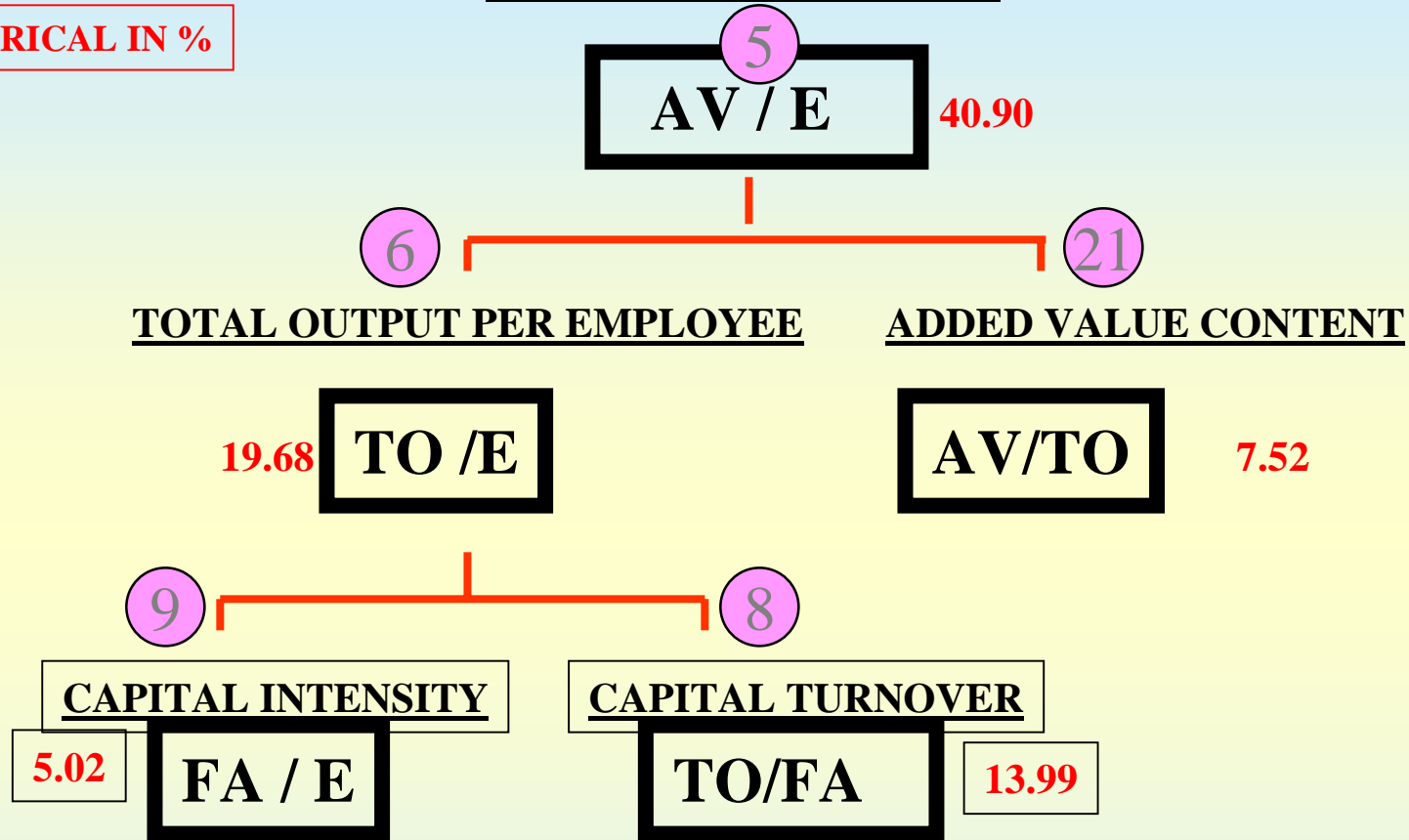
## LABOUR PRODUCTIVITY

NUMERICAL IN %

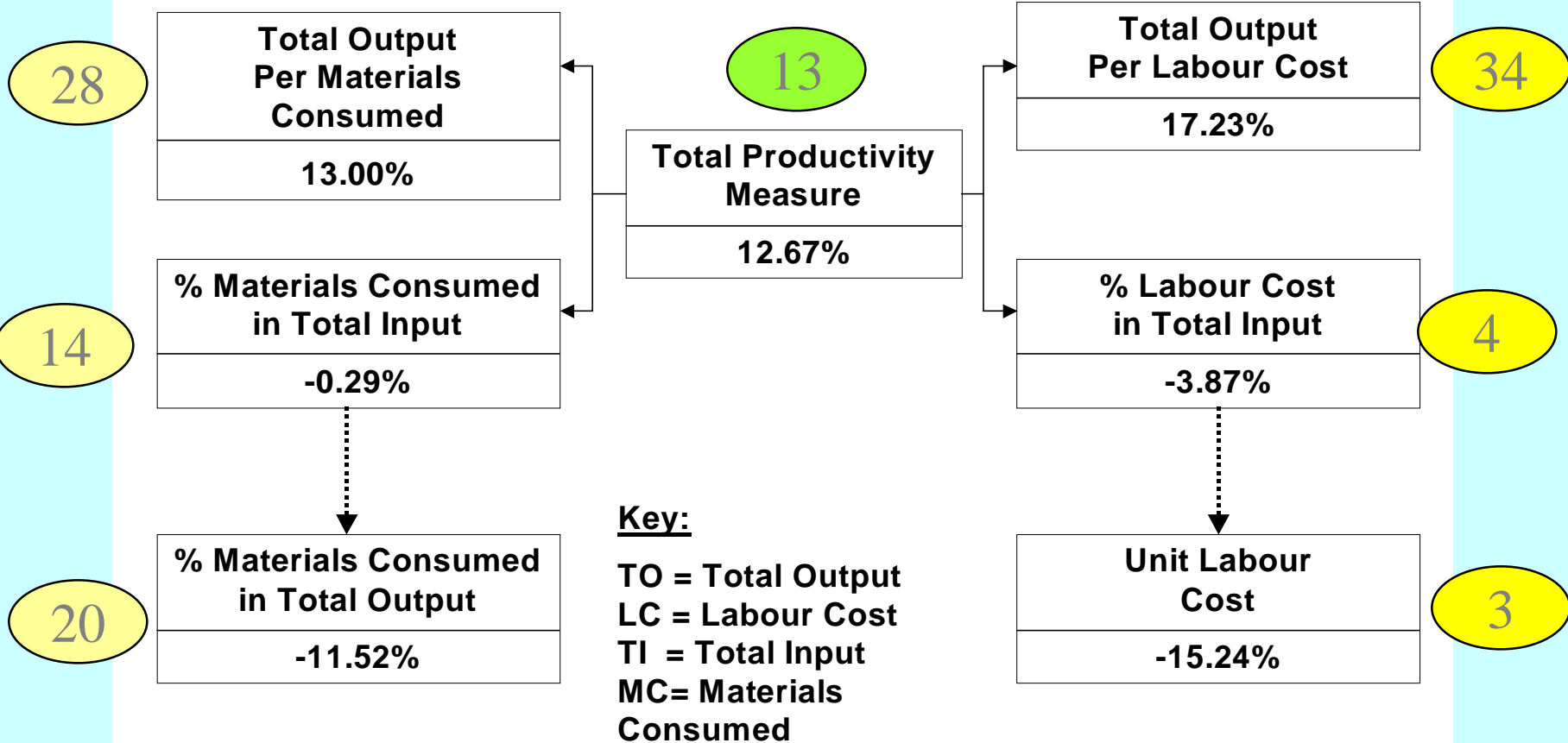


## LABOUR PRODUCTIVITY

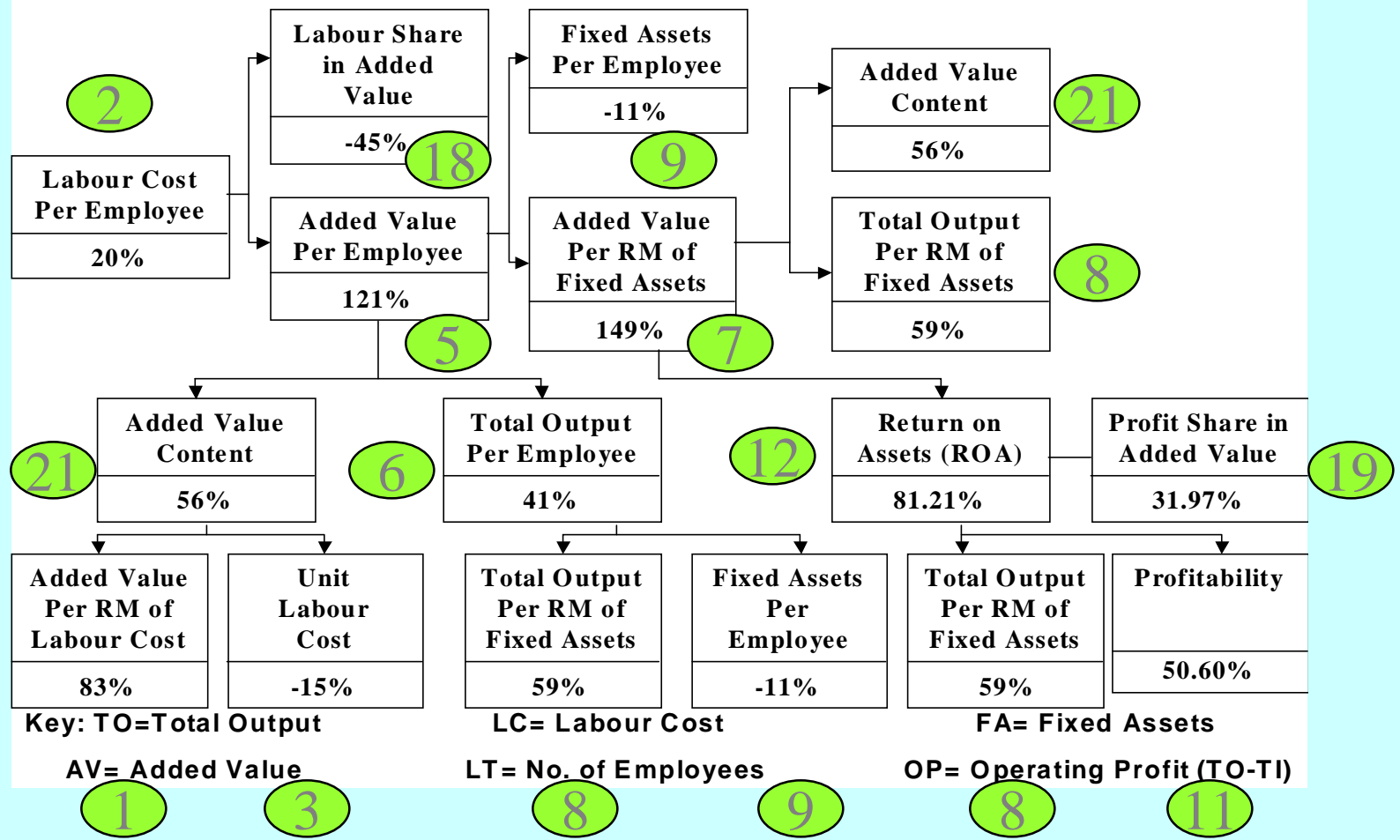
NUMERICAL IN %



## SPECIFIC LINKAGES OF TOTAL PRODUCTIVITY MEASURE : A



**LINKAGES AMONG THE VARIOUS PRODUCTIVITY RATIOS : A**



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**S** System

**M** Measurement

**I** Improvement

**L** Learning

**E** Environment

**S** Sharing

# TIME WAITS FOR NO ONE

- To realize the value of one year:  
ask the student who has failed his final exam
- To realize the value of a month:  
ask the mother who has given birth to a premature baby
- To realize the value of one week:  
ask the editor of a weekly newspaper
- To realize the value of one day:  
ask the daily wage labourer who has 10 kids to feed
- To realize the value of an hour:  
ask the lovers who are waiting to meet
- To realize the value of one minute:  
ask the person who has missed the train, bus or plane
- To realize the value of one second:  
ask the person who has survived an accident
- To realize the value of a millisecond:  
ask the person who has won a silver medal in Olympics



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# THE MYSTERY OF PRODUCTIVITY

They seek it here,  
They seek it there,  
They seek it everywhere  
    Is it in labour ?  
    Is it in capital?  
        or energy?  
        or whatever  
That damned productivity genie.  
    Some pressed the data,  
    Other massaged it  
    Yet others molested it.  
    BUT  
Whatever was done  
It remained a mystery  
That damned, elusive productivity genie



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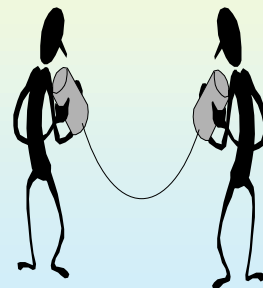
# Enquiries ???



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THANK YOU



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