The Economics of Textile Manufacture in a Global Environment.

Factors of Production

(see also Introductory Economics - G F Stanlake)

The factors of production are the four main 'cost areas' of a production unit.

- LAND
- LABOUR
- CAPITAL
- ENTERPRISE

These are composite items, and each has its own costs associated.

LAND
Rent, rates, buildings, maintenance etc. and also includes natural resources, minerals, water, forests etc.

LABOUR
Wages and salaries, plus other charges associated including national insurance costs, holiday pay, sickness benefit.

CAPITAL
Interest charges, arrangement costs, settlement fees, share floatation etc.

ENTERPRISE (*Enterprise is sometimes seen as simply part of labour, as payment to the originator of the enterprise.)*
These are the charges due to entrepreneurial aspects. They represent the profits of the company. (It might be seen to contain dividend payments to shareholders although this is often seen as a capital cost.) *Why the confusion.....*

Whilst all are important, the ratio between the capital costs and the labour costs is the most important in the context of this course. The ratio determines whether the company is 'labour intensive' or 'capital intensive'.

Each factor has its own separate costs. These, in general, are determined by the laws of supply and demand. *(see your Microeconomics notes)*
This is the theory, however there are sometimes outside influences which may affect the supply of the factors, or may affect demand for a specific factor.

When considering supply and demand, both are often assumed to be dynamic. This may not always be the case.

Supply

Supply in certain cases may be static. Land, for example, is finite.
Is this true?……..

When is this not true?……

Labour supply is not equivalent to the population. Only a proportion of the population is available as a workforce. This proportion depends on the age composition and the local working legislation, hours of work, holidays, minimum working age etc.

Labour is an area where supply is fixed.
Is this true?……..

When is this not true?……..

Demand

Demand is normally seen as being dynamic. Demand is always expected to vary with price.

However some products have an almost inelastic demand.

Examples of goods with dynamic demand characteristics.

Examples of goods with static or near-static demand characteristics

Some goods may be inelastic in one direction only.

In the main, and particularly in the textile and clothing area, the demand for most goods is dynamic.

Neo-Classical Economic Theory

Neo-Classical Economic Theory posits that market forces will value Factors of Production by a relationship dependant on their relative availability in an economy. Hence any technology using Factors of Production closest to their relative availability should yield the lowest cost of production

This is an excellent theory but it fails when any real situation is examined. When examining either developed or less-developed countries, it becomes obvious that this is not a workable solution.

Most developing and less-developed countries are plagued with unemployment and with under-employment.

Under-employment is ……

Why is the Theory Unworkable.

There are various reasons put forward for the failure of the theory.

1 - Imperfect operation of the market so that the factor prices do not reflect availability.

2 - Labour and capital are not single entities.

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3 - The minimisation of costs may not be the major objective of any company investing in a country.

What other objectives could there be?

It should be noted that, although the theory is flawed, it does give a useful guide to the levels of costs a company should aim to achieve in an investment situation.

There is no single answer.

When examining overseas sourcing and investment in manufacturing abroad, it should be noted that there is no single ideal solution.

Companies producing similar products in the same area of a country may have adopted totally different options,

e.g. types of ownership - wholly owned, govt. partnership, private partnership etc.
management - home or local, supervisory levels, flat/hierarchical structure etc.
strategy - for growth, for supply, for investment etc.

Distorted Costs

When factor costs do not reflect the relative availability of the factor then the costs are said to be distorted.

If factor costs are distorted then any decision-maker will be pushed into a choice of technology which will not be in the host country's optimum interest.

Institutional Factors of Production

These are specific factors dependent on the country, the site, the population, the environment etc. and may be simply classified under FOUR sections.

Capital

Management sharing schemes
Who controls the company, locally and strategically?
Capital interest rates
What are the lowest rates, are these available locally?
Structure of Capital Markets
What do the local money markets operate, are there any locally?
Credit facilities
Are there any special limitations, on amount, on time, on use?
Capital export restrictions
Can the company use the capital abroad, anywhere, everywhere?

Labour

Mobility of labour
Does the labour annually move to other areas? Can labour move to your site?
Minimum wage agreements
Is there a minimum wage system, is it age related?
Profit sharing
Is it necessary, profitable or useful for motivation?
Labour law legislation
Is there a minimum age for work? What other laws affect employment?
Trade union representation
Are there unions, must they be allowed access to workers, are they strong?
Education & training schemes
Is the local system sufficient, will they improve it in the way we want?
Will we have to provide training, will we be expected to provide education also?
Attitude to manufacturing
Do the locals wish to work in manufacturing? Do the locals wish to work at all?

Society

Mix of the society
Is it a single society, are there different groups, tribes, races etc.
Is this a problem?

Degree of competition for the product
Does the product exist in the country? Do the population want it?
Do the govt. want it? Do we wish to sell it here, or export it to other markets?
Income distribution method
How is income spread among the population, officially or unofficially?

Sex or Religious discrimination
Can Men & Women work freely together, are women allowed to work?
Is this a problem?

Government

Local infrastructure
Are there sufficient roads, railways & airports?

Export & import limits

Will there be limits on our imports or on our exports, or on our profits

Export & import arrangements

Are these fast and simple? Do they work?

Industrial incentive schemes

Are there any special inducements for the company?

Inducements and Fees

What is structure of the govt. are bribes to officials required in normal business?

Degree of competition for machines & technology

Does the country already have similar technology within its borders?

How keen are the govt. to obtain this technology?

Importance of the institutional factors - Small firms wishing to begin manufacturing in the country will obviously have to work within the factors and their stated limits. However, depending on the size and level of development of the country, large multi-national companies may find that they can adapt some of the factors, either officially through pressure on the government or unofficially through the workforce, to meet their own ends.

Appropriate Technology

Technology

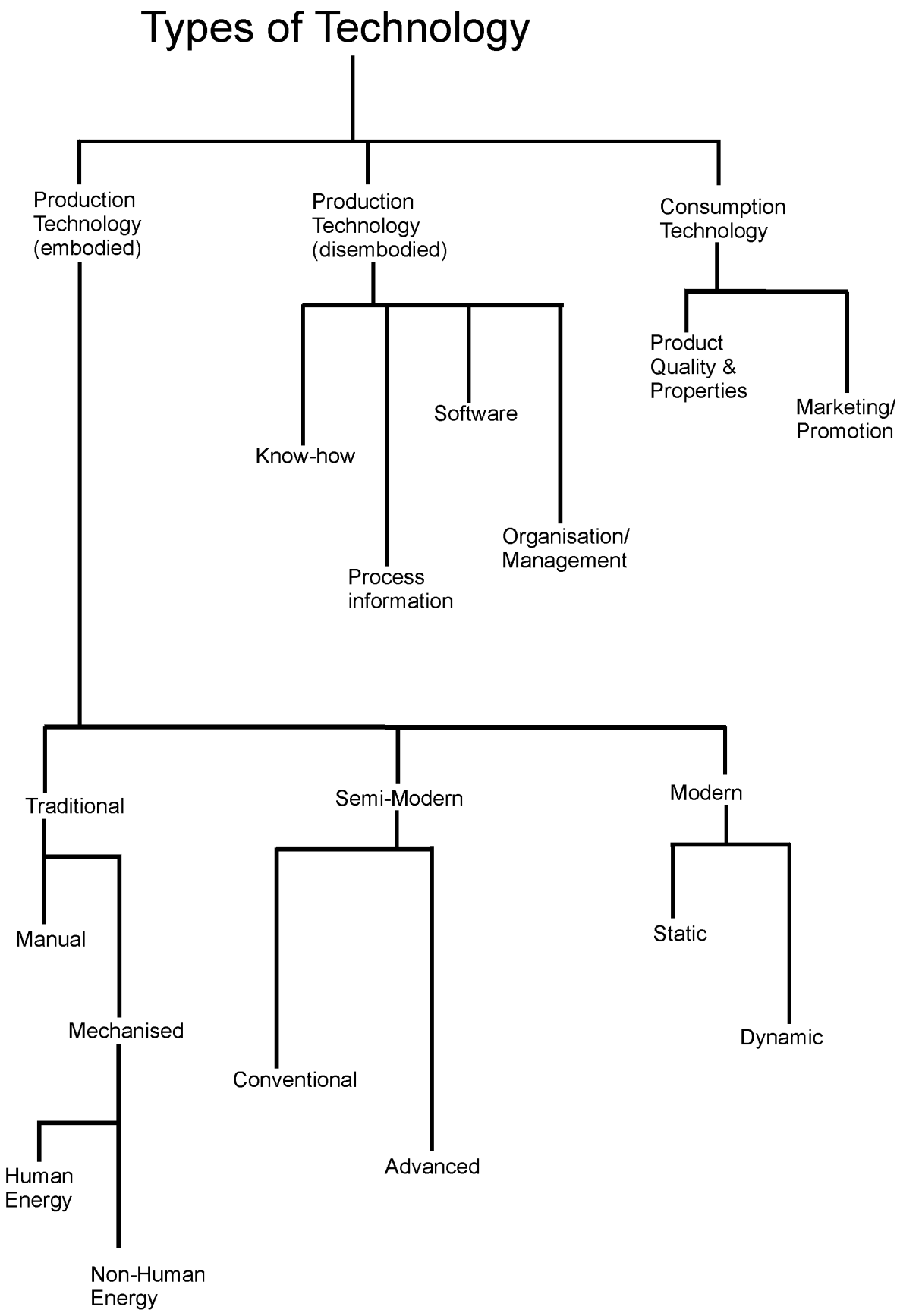
Technology is defined as a means of production embodied in equipment and/or disembodied in the form of know-how, which is used in order to obtain output.

Technology therefore covers a wide range of levels of productive capability. The choice of a specific technology which is appropriate to its siting depends on many factors.

Appropriate Technology

Appropriate Technology is the means of production or know-how, which minimises sacrifices for given benefits, or alternatively maximises benefits for given sacrifices, given its compliance with a number of essentially differing conditions.

Before looking at Appropriate Technology you should appreciate what is included in the term 'technology' in the textile production area?


Types of Technology
Production Technology (embodied)
Production Technology (disembodied)
Consumption Technology
Know-how
Software
Process information
Organisation/ Management
Product Quality & Properties
Marketing/ Promotion
Traditional
Semi-Modern
Modern
Manual
Mechanised
Human Energy
Non-Human Energy
Conventional
Advanced
Static
Dynamic

Examples of Technology Levels

Traditional

Manual

Mechanised - Human Energy

Mechanised - Non-Human Energy

Semi-Modern

Conventional

Advanced

Modern

Static

Dynamic

These may be re-classified at any point of time however. The Modern area is generally more difficult to assign.

Back to Appropriate Technology

Remembering that appropriateness depends on benefits and sacrifices within a set of limitations, it remains to decide what conditions are relevant.

The major conditions are:-

- production process (see later);
- cultural conditions;
- environmental conditions;
- resources.

It becomes obvious that appropriateness is really a measure of economic development. It is however, not only a function of the level of development, but also a function of various other macro indicators that may be relevant for a particular country.

These include:

- Political & Economic ideology
- Geo-political location
- Historical or Colonial background
- Natural resources

A major problem with appropriateness is change.
Appropriateness changes with :-

- country,
- location within a country
- time
- government

External changes may also be relevant:

- changes in power supply
- access to ports
- unrest on borders
- destabilisation by foreign powers etc.

Production Process Conditions which may affect Appropriateness

One of the conditions which affect appropriateness is the production process. The production process is a complex set of factors which describe the basic requirements of the production process, its inputs, its operation and its outputs.

Input Conditions

Labour -
Capital -
Technology requirements -
Specialised Skill Requirements

- for direct operation
- for Production Planning
- for Marketing,
- for Maintenance & repair
- for Understanding of Technology & Production Management

Raw Material Availability -

Operating Conditions

Condition of continuing inputs

raw material quality
humidity
temperature

Operating Conditions
Noise levels
Dust and waste products -
Maintenance -
Satisfactory buildings, foundations floors etc.

Consumption levels
raw materials
energy
water

Output Conditions

Capacity -
Flexibility -
Quality of output

Other Conditions - these may be considered

Employment considerations
Basic needs of the population - local and wider area
Ecology
Socio-Economic, Cultural & Political systems

It must be remembered that a deficiency in any of the condition areas can make a specific technology inappropriate.
However - the measurement of appropriateness is subjective and is not easily assessed.

Method of Measuring Appropriateness

Any method of measuring appropriateness should include an objective related to the welfare of human society. The appropriateness may then be assessed by the amount it contributes to this welfare objective.

If there is no objective related to the welfare of human society , then any decision is of only short term benefit to an investor, investments generally having a short lifespan.

Design of Technology and its Target Market

The majority of textile machinery is designed and manufactured in the developed countries of the world, and much of it has been designed for use in developed countries. This is changing slowly and more machines are being produced both for, and by, less-developed countries.
This machinery might then by designed for the typical less-developed country.
Name one typical less-developed or "third world" country….

Less-developed countries may be grouped by : size, location, ideology, resources etc.

Labour and Technology

The choice of technology will be affected by the availability of the different types of labour and by other features associated with labour.

In Developed Countries

In western Europe, where the technology is normally at the highest level, there are certain problems for traditional industries.

Labour, via the trade unions, may cause governments to create minimum wage levels, well above the natural wage suggested by the availability factor.
Why is this?

What are the alternatives?

What problems does this cause?

Loss of valuable jobs? -

Higher unemployment?

Companies closing?

Another problem for companies is that the workers aspirations have changed. It is well known by all now that new technology is replacing old boring repetitive jobs with new interesting and rewarding ones. This is particularly true with each new generation.

Is this an accurate description of the facts?
Example - Typist -

Example - Draughtsman -

Example - Paintshop Operator -

Example - Warehousemen -

This situation fuelled unemployment and led to disillusionment of much of the workforce.

The problem for companies not in the luxury end of the market - if unemployment is high then easy to offer low wages - but who will then have the disposable income to buy the goods. For luxury goods - a market of some size is always available.

Production Conditions Necessary in Developed Countries

In most of Western Europe, the following conditions are necessary for successful operation of a production plant.

Conditions Related to Labour
Labour saving equipment
De-skilling of work
Increased energy requirement
High safety levels
Functional equipment
Low maintenance costs
High reliability levels
Increase in specialist staff

Conditions Related to Materials
Energy saving machinery
Reduction of processes
Energy saving operations
Raw material savings
Minimising waste

Conditions Related to Output
High quality (?) -
Easy care
High fashion sensitivity
Built-in redundancy

Conditions Related to Environment
Safe disposal of toxic waste & pollutants
Minimal contamination of water
Compliance with clean air acts
Avoidance (Minimisation) of noise nuisance
Fit in with local scenery - of much less importance apart from very special areas

The individual conditions will vary in importance dependent on the country concerned, and with specific areas within the country.

Production Conditions in Less-Developed Countries

There are many differences between the list above and the conditions for less-developed countries, some of the major differences are shown below.

Labour will be more plentiful

Labour will have less power

Young workers will be eager to learn - even low-level jobs

Fewer concerns over health and safety
How much is the little finger on your left hand worth?

Fewer environmental worries
Water supply, Waste dumps, any secure disposal sites??

More encouragement by government
Governments are normally keen to attract companies and will overlook small oversights on health & safety to bring wealth to the country.

The Use of Labour

Labour usage covers a wide variety of features, from hours worked per week, work patterns, holiday entitlement, payment schemes, to employment practices.

Work Patterns

Work patterns may be of two major types - Static and Dynamic. Each of these types has many possible forms and, in addition, there are possibilities of mixing different patterns.

Static Shifts

Where employees are employed for hours which do not change over a normal work cycle.

- Day Shifts - 8 hours per day for 5 days
- Day Shift plus Evening Shift -
- Day Shift, Evening Shift & Night Shift -.

Dynamic shifts

Where employees are employed for hours which do change within a normal work cycle.

- Double Day Shift -
- Three Shifts - Double Day plus static Night Shift -
- Four Shifts -.

Payment of Labour

In a production unit there will be several types of labour, unskilled, semi-skilled, skilled and supervisory. In addition there will be line management and other specialised management functions. Often supervisory positions, as other management positions, are staff jobs and are paid on salary rather than in the form of wages.

Looking at the non-staff labour types only, often trade unions exist for each of the different trades and skills. In times past, weavers had their own union as did yarn workers. The modern trend is to move to unions for whole industries e.g. Textile Workers Union. This facilitates dealing with unions.

There are certain workers in the factory who may be members of other unions, e.g. electricians, plumbers or mechanics. These may have to be employed under different conditions from the rest of the workers or even from each other.

There will obviously, in most production units, be a range of payment systems and varying levels of pay.

For non-staff positions, the most common forms of payment are:

day rate
piece work (or some variant)
bonus scheme
some combination of the above.

Day Rate

Day rate is the payment for hours worked, payment by standard hourly rate.
Day rate can be used for several types of employee, including

unskilled
skilled craftsmen -
some operators - where output is set by machine

-

- or where output is difficult to measure

-

Piece Work

Piece work is payment by output - (per piece produced) - may be measured by weight or number of items.
Piece work is used for some operators, particularly in clothing manufacture, and possibly for some ancillary staff. Operators may be on piece work in jobs where their efforts can radically affect production levels, where their skill and speed can affect production levels.

What sort of jobs might be paid by piece work?

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Any operator working on machines that have to be stopped for attention, (e.g. ring frames waiting to be doffed, and weaving machines) might be paid by piece work in order to maximise production.

Individual and Group Payment.

The majority of workers are paid on their personal efforts. Some workers are in group payment schemes where each member of the group or team is paid the same, a figure based on the overall output of the group.
Ring doffers are one group that may be paid as a group.

Note - Ring doffers are a team who, once the spinner has stopped a ringframe when its tubes are full, work as a team to remove all the full tubes, replace with empty tubes and piece-up the ends. The ringframe then again becomes the responsibility of the spinner.

Deciding on Rates of Pay

When planning a wage structure there are certain aspects that must be considered. These include:

the wage structure itself,
the method of differentiating wage levels between workers
the levels of pay for the workers,
and how to provide motivation to the workforce.

Requirements of a Rational Wage Structure

1. It should be easy to understand by both managers and workers.

2. It should contain broad job specifications in order to identify each grade of worker

3. It should clearly state an approximate wage level that each grade of worker should expect to earn.

4. It should provide reasonable differentials between different grades of workers. These differentials should depend on the skill and responsibility required for a job, and also on the working conditions.

5. It should provide an incentive for each worker to increase his/her individual or group efficiency and productivity, and for management to supply the necessary conditions to achieve this.

Differentiating Levels of Pay

As industry became more competitive, it became increasingly necessary for employers to ensure that they were obtaining good value from their workers.

Some form of measure was needed to identify the value of the work of each employee. Work Study was one method. This effectively measured the **amount** of work supplied by an employee.

This was not sufficient to create a fair and rational system of payment. What was really needed was a systematic process for assessing the **relative** worth of different jobs. A method to achieve this is **Job Evaluation**.

Job Evaluation does not assess the employee's performance in a job, it simply ranks jobs according to their relative worth. A basic wage may then be derived for each job which is fair according to the value of that job in the organisation.

There are various methods for assessing the relative worth of jobs. One relatively simple example examines the job in FOUR categories, Skill, Conditions, Responsibility and Effort.

Each category is split into identifiable aspects and each is given a maximum possible score. Each job may now be assessed against this scale and individual job values calculated. A simplified example is shown below.

Area & Factor		Range of Values
1.	**Skill**	Max 50
	Learning required	0-10
	Complexity period	0-10
	Mechanical ability of process	0-15
	Dexterity required	0-15
2.	**Conditions**	Max 20
	Disagreeable	0-5
	Dust	0-5
	Risk of accident	0-5
	Risk of disease	0-5
3.	Responsibility	Max 15
	For material	0-4

	For equipment	0-4
	Attention to orders	0-3
	Effect on subsequent processes	0-4
4.	Effort	Max 15
	Heavy work	0-6
	Abnormal position	0-2
	Monotony	0-2
	Vigilance required	0-5

In an ideal situation, values for each section would be assessed by a small working group. This group would have representatives from:

production management;
training;
personnel;
supervisory management.

If this process is carried out in an operating factory, the changes in wage levels, based on the job evaluation, should be phased in over a period. This would be built into the normal wage bargaining structure.

Motivating the Workforce - Incentive schemes

Any payment scheme that encourages output is an incentive scheme. It is a method of providing an incentive, normally in the form of cash, in exchange for improved performance.

For a scheme to be effective, and acceptable, it needs to have certain prerequisites.

Prerequisites for Incentive Schemes

1. Accuracy of standards - standards must be as accurate as can be afforded. Accuracy costs money and a requirement to too great a level of accuracy may cost more than the scheme will deliver.

2. Accuracy in measuring production - accuracy must be assured for individual output (or group output)

3. Standard conditions - workers targets need to be established and maintained.

4. Hourly base rates for workers on any incentive scheme should be guaranteed to be equal to hourly base rates for similar jobs.

5. The incentive payment should be directly proportional to the increased output.

6. Possible bonus earnings must be of a size large enough to provide a motivating force to encourage the worker to maximum production.

7. A clear policy is required, with standards specifying when standards may be varied. This must be clear, encompassing and adhered to.

8. A complete wage policy should be both in existence and in a written form before it is put into operation.

9. Any plan should be simple to understand and any employee should be able to calculate his/her earnings without difficulty.

10. Any temporary adjustment in production standards should be made or authorised by authority/standards department -- never by the production management or supervisor.

11. The plan must be policed constantly and maintained in good working order.

Types of Incentive Schemes

Piece work
The simplest form of incentive scheme is piece work (see earlier). It has one main disadvantage, it imposes a risk of loss of earnings on the worker, possibly for a reason for which he/she may not be responsible.
Hence most piece work schemes have a safety net of between 75% and 100% of day-rate earnings, (i.e. this minimum figure is a guaranteed wage).

A good employee should be able to earn 20% to 30% above the day rate.

Premium & Bonus Plans
There are a variety of this type of scheme but all basically share gains and/or savings made on the standard time (the target time per item) with the worker to some extent, OR have multiple piece work rates giving higher rates per item as output increases.

Measured Daywork
A system which pays a regular agreed wage based on a measured output over a period. This can change for the next period if the output changes.

Profit Sharing
There are many forms of profit sharing, but all take a percentage of the profits and split this cash between all the workers, (or those who satisfy certain requirements).

The method of distribution may be 'per capita', the same amount each, or based on wages/salaries, the number of employee shares held etc.

There is however, two major disadvantages to the use of profit sharing as a motivator.
What are these disadvantages?

It can improve goodwill and company loyalty and is sometimes used as part of the incentive scheme.

Group Payment Schemes

A payment system for the situation where a job is performed by a group of workers working together,

e.g. ring doffers - on non-automated machines, a group of possibly FOUR workers works as a team on a single machine. Payment might be based on a 'group piece rate' and is shared equally amongst the group.

This group payment method has certain advantages:

greater co-operation within the group;

reduced supervision;

reduced training time;

improved time keeping;

reduction of absenteeism.

Value of Incentive Schemes

Incentive schemes have been known to increase production by over 40% whilst increasing labour costs by 15% - 20%. However, any scheme must be well-planned and well-administered to be of real value.

Labour in Developing Countries

Working practices and payment methods for developing and less-developed countries will be similar to those of developed countries, but there will be some variations in the operation of schemes.

The following are general statements which have been true in some areas. They do not attempt to state the situation in any particular country or group of countries.

In a less-developed country:

1. It is likely that less multi-shift working will be used.
2. It is likely that more jobs will be operated on piece work rates
3. In many countries the hours of work for employees are likely to be greater than in a developed country.
4. Companies sometimes set excessively high personal output targets causing effectively compulsory unpaid overtime.
5. Levels of pay are normally below those in the company's home country. Sometimes the pay levels are VERY much lower.
6. There is less job protection, hence more opportunities for flexibility in operations.
7. There is little legislation on sex discrimination or on discrimination on ethnic grounds allowing a closer control of the workforce.
8. Health and Safety legislation will be relatively less important than in a developed country.

9. If accidents do occur, settlements will be much lower, also with little trade union power, cause and responsibility will be easier to handle.
10. The levels of production per employee will often be lower than that for a similar employee in a developed country.
Why is this - do developed country workers work harder?

In addition to the above, it must be remembered that there is often no tradition of the industry in the area, so there is little or no skill available.

Labour as a Determinant of Technology Choice

When making the choice of technology for a possible investment in a production unit abroad, the aspect of the labour supply must be carefully considered.

The obvious considerations are:
cost of labour;

availability of skilled labour;
availability of trained labour;
availability of labour to train;
acceptability of shift working.

Other points that need to be considered;
- the keenness of the population to train for semi-skilled/operator jobs;
- the reliability of potential employees;
- a suitable social structure to encourage people to work in manufacturing;
- stability of population;
- is there a high level of unemployment?
- Are there any religious problems of differences?

Whilst all the above points are important, the most important point to many companies to the cost of labour. This varies greatly from country to country (see table overleaf).

In addition, wage levels are not static even in developing countries.
For textile operatives, the minimum wage is a good indicator of wage levels. In the UK experience shows that the minimum wage may increase by 3-5% per year.
In developing countries, this increase may be much greater. Indonesia doubled its minimum wage in the early 1990s and continued this increase through the rest of the decade.
(see "Consequences of Doubling the Minimum Wage – Indonesia" and "Indonesian Regional Minimum Wage Rates 1994-1999" in web notes)

Labour Costs in Spinning & Weaving 1994

			Weekly Wage Cost in Sterling	
			US$/hr	£
1	Japan		25.62	665.45
2	Switzerland		25.46	661.30
3	Belgium		23.15	601.30
4	Denmark		22.04	572.47
5	Netherlands		21.77	565.45
6	Germany W		20.77	539.48
7	Austria		19.47	505.71
8	Norway	*	18.46	479.48
9	Sweden		17.34	450.39
10	Germany E		16.26	422.34
11	Italy		15.65	406.49
12	France		15.35	398.70
13	Canada		13.6	353.25
14	Finland		13.07	339.48
15	Australia		12.42	322.60
16	USA		11.89	308.83
17	Ireland		11.07	287.53
18	UK		10.74	278.96
19	Spain		8.55	222.08
20	Greece		7.68	199.48
21	Israel		6.81	176.88
22	Taiwan		5.98	155.32
23	Hong Kong		4.4	114.29
24	Portugal		4.02	104.42
25	Korea S		4	103.90
26	Singapore	*	3.56	92.47
27	Uruguay		3.31	85.97
28	Mexico		3.22	83.64
29	Tunisia	*	2.97	77.14
30	Argentina		2.89	75.06
31	Turkey		2.31	60.00
32	Hungary		2.19	56.88
33	S Africa		2.19	56.88
34	Columbia		1.88	48.83
35	Venezuela		1.85	48.05
36	Brazil		1.76	45.71
37	Peru		1.7	44.16
38	Mauritius		1.55	40.26
39	Morocco		1.54	40.00
40	Slovakia		1.54	40.00
41	Czech Rep.		1.51	39.22
42	Poland		1.51	39.22
43	Thailand		1.41	36.62
44	Malaysia	*	1.18	30.65

45	Syria	*	1.12	29.09
46	Philippines		0.95	24.68
47	Egypt		0.64	16.62
48	India		0.58	15.06
49	China		0.48	12.47
50	Zimbabwe	*	0.47	12.21
51	Indonesia		0.46	11.95
52	Pakistan		0.45	11.69
53	Zambia		0.43	11.17
54	Sri Lanka		0.42	10.91
55	Kenya		0.41	10.65
56	Nigeria	*	0.41	10.65
57	Vietnam		0.39	10.13
58	Bangladesh		0.26	6.75
59	Tanzania	*	0.22	5.71

* 1993 figures

Ref. Werner International & Textile Outlook International - July 1995

You will find up-to-date figures in many of the current textile journals. Remember - the figures are not necessarily **wages** - they represent the **cost** of the labour and include items such as holiday pay, sickness benefit and national insurance payments and their equivalents where applicable.

These figures need to be reviewed together with the labour considerations as a whole.

The Reasons for Multinational Company Investment Abroad.

When surveys are carried out on company strategy in the UK, little information can be relied upon in. This is because company strategy is seen as sensitive information and, as such, is highly confidential.

Some information is released however, and the following is a result of one such survey.

The stated reasons for companies investing in production units abroad were as follows:

1. Due to the political situation

2. Due to economic considerations - growth of market etc.

3. Social circumstances

and also coming in low down the list

4. Wage differentials

Job Export

Any investment in production units abroad by a home country company is obviously an export of jobs.

However, the number of jobs involved may be far less than might be created in a developing country - dependent on the level of technology used.

Output as a Determinant of Technology Choice

When considering output, one of the most important areas to consider is the economies of scale. (see also Economics for Business Students - Vol.1 - Paulus for a simple approach OR use your Microeconomics notes)

Factors which Produce the Economies of Scale

1. Economies from the division of labour
As a company expands and output increases, this allows the specialisation of the workforce. Each operator will be an expert at a specific job and training will be easier and quicker.

2. Financial Economies
The larger the firm, the easier it is to raise capital. Larger firms offer greater security and hence can obtain capital at lower interest rates.
Is this reasonable?

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3. Economies of Machinery
The larger the output the greater the number of products which carry the cost of large and expensive machinery.

4. Marketing Economies
Larger companies can achieve more cost effective advertising schemes than smaller rivals.

5. Economies of Research
Research and Development will make the company's products more competitive or more desirable. Only larger companies can afford research activities.

6. Purchasing Economies
The larger the firm, the larger the requirements for raw material, consumables and components. This large requirement allows bulk buying and the negotiation of generous discounts.

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7. Management Economies
This operates in a similar manner to Labour Economies, allowing managers to specialise leading to higher work output and increased effectiveness.

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8. Economies of Administration
As for Management. This is sometimes included in the Management Economies section.

Limits to the Economies of Scale
If we continue with the economies of scale to the logical conclusion, the result is total centralised production. According to the economies of scale, this would provide the maximum efficiency. However as an organisation grows, it finds that there is another aspect to consider where size becomes a problem rather than an advantage.

Diseconomies of Scale

Diseconomies of scale are experienced in several areas of operation.

Communications - The large size of the organisation will normally cause communication problems. Poor communication will both cause problems in maintaining efficiency and will tend to lower staff morale. It also tends to create duplication of effort.
Self Esteem - Working for a massive organisation, the worker will have little expectation of having any effect, whatever his/her efforts. This lowers staff morale and tends to lower self worth.
Increased Goods to Distribute - as the company grows, it tends to flood the market of its own area. It needs new markets, further away. This means extra transport costs, new distribution centres, more sales staff.

Marketing - In the same way, marketing costs will need to increase to cover the new areas of operations.

Also there are other possible consequences including increased supervision and management, required not for production, but to manage the complexity of the company.