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**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO)**  
**Technical Information on Industrial Processes**

# **STRUCTURE OF PRODUCTION COSTS in Footwear Manufacture**

by

**Ferenc Schmél**

*Industrial Development Officer*

for the 14<sup>th</sup> Session of the UNIDO Leather Industry Panel

Vienna, 2003

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## INTRODUCTION

Representatives of the leather-based industry – especially those involved in leather products (footwear, leather goods, gloves, leather garment and sports good sub-sectors – have been quoting production (especially labour) costs as the main or the only reason for shifting these manufacturing capacities from industrialized to developing countries (or in other words: from North and West to South and East) during the past three decades. However only rather unreliable statistics on (industrial) wages paid to direct (manual) workers in various countries or regions of the world or statements made by businessmen and managers of multinational companies were to support such reasoning. At the same time the world-wide development of the leather and its derived products manufacturing industry demonstrates several instances contradicting to this assumption: it is sufficient to mention Italy, South Korea and Portugal as counter examples.

The main *objective* of this survey is double fold: to clarify actual differences in direct manufacturing costs of footwear production in selected countries and to review proportion of different cost components/structures in case of comparable labour intensive products such as footwear and/or its upper. As styles vary considerably (chiefly due to fashion and market demand) and systems of costing used different part of the world are far from being uniform, a common scheme of costing had to be established. This was based on more or less standard types of shoe styles and on a suggested simple of cost computation algorithm.

UNIDO – relying on its contacts established through previous technical assistance projects, the Leather-based Industry Panel and personal contact – approached organizations (companies, associations and institutes) in 1999 in 42 countries to seek their assistance in collecting information on cost components and/or actual costing sheets characteristic for or representing of the local shoe industry. Finally data were received from the following 12 countries: Costa Rica, Czech Republic, Egypt, France, Hungary, India, Italy, Kenya, Mexico, Philippines, Turkey, Ukraine and Zimbabwe. (According to UN classification this corresponds to 2 industrialized, 3 transitional and 7 developing countries. The geographical distribution: Africa – 3, Asia – 2, Europe – 5, Latin America – 2.) Although in strict statistical sense the limited number of voluntarily submitted data cannot serve as representative fro the entire world, it is suitable for make some indicative conclusions regarding general trends governing the international trade of footwear.

All known (internationally active) footwear CAD suppliers were approached and offered the opportunity to demonstrate costing-related modules of their systems through real examples. Surprisingly only three company responded – they deserve to be mentioned here: CLASSICAD SPOL. S R.O. (Czech Republic), DNT S.R.L. (Italy), SHOEMASTER/TORIELLI RAG. PIETRO & C. S. P. A. (Italy).

## PRINCIPLES OF COSTING

All (industrial) activities are associated with costs – nothing comes free in market economy environment. Production results (products) are consequences of using inputs (plants, materials, labour, knowledge and information – frequently referred to as resources) and adding ideas and special features (e.g. design, brand, quality) of the manufacturer.

### Terminology

According to general understanding costs are prices paid or required for acquiring, producing, or maintaining something, usually measured in money, time, or energy; expense or expenditure; outlay.<sup>[1]</sup> In industrial and economic contexts cost is a measurement, in financial terms, of the amount of scarce resources used for some purpose;<sup>[2]</sup> the amount of expenditure (actual or notional) incurred on, or attributed to, a specific thing or activity.<sup>[3]</sup> Like everyday perception, these definitions mention or imply that costs have *monetary equivalence*, i.e. costs are normally expressed in financial terms.

Costs may be classified by their *behavior* as

- *fixed costs* do not change with the level of production (e.g. rents, insurances, salaries of certain executives);
- *variable costs* are in direct proportion to the volume of production (e.g. materials, wages, packaging);
- *semi-variable costs* increase or decrease as volume of production changes but not in direct proportion (e.g. sales ledger).<sup>[4]</sup>

In relation to products or services provided by a manufacturing company costs may be

- *direct costs* can be identified with and allocated to products/units (e.g. materials, labour charges including related social costs, expenses such as lease of special equipment required for manufacturing certain products);
- *indirect costs* – often referred to as *overheads* or *burdens* – cover materials, labour and expenses which it is either impossible or inconvenient to charge direct to the product/unit (e.g. supervision, administration, maintenance, utilities).<sup>[2]</sup>

The **price** is the amount of money paid for products or services according to the set/agreed terms and as such is a very marketing tool.<sup>[6]</sup> The selling price of a manufactured product consists two items: its cost to the manufacturer and the manufacturer's profit.<sup>[4]</sup> *Net prices* do not include any taxes (e.g. Value Added Tax – VAT, sales tax) paid to governments or their agencies; *gross prices* include such taxes and/or handling or forwarding costs. In case of commodities produced by the industry and supplied to customers – usually through various sale channels – prices are relative to partners participating in the actual transaction. The most frequently met variants are production or ex-factory, wholesaler, retailer, import and export (FOB, C&F, CIF, DDU etc.) prices. Prices may also include services provided to the buyer or ultimate user for a given period of time (e.g. installation, guarantee, repair and/or maintenance). Final prices and payment procedures along with delivery terms are usually agreed in negotiations with the buyer.

**Subsidy** is a financial aid supplied by a government, as to industry, for reasons of public welfare, the balance of payments, etc.; any monetary aid, grant, or contribution.<sup>[1]</sup> Such financial support may be provided to manufacturers or traders (wholesales, distributors or retailers), but in any case it distorts free competition and, therefore, it is not compatible with market economy.

If the result of an economic – including manufacturing – venture is positive, i.e. the revenues/income surpasses expenditures (costs), then *profit* is produced, otherwise the business produces *losses*. Both entrepreneurs and governments are interested in generating profit: formers to gain return on their investments, the latter to collect (corporate) taxes. In market economy conditions theoretically and indirectly customers are also interested in profitability of all participants of the supply chain – manufacturers and traders – otherwise the given commodity would not be produced, supplied and available.

The *price and cost structure* has the following components:

DIRECT	Direct material	Prime costs	Factory costs	TOTAL COSTS	NET SELLING PRICE
	Direct wages				
	Direct expenses				
INDIRECT	Factory overheads				
	Administrative overheads				
	Selling overheads				
	Distribution overheads				
	Profit				

### Costing methods

**Costing** is the function – normally undertaken by administration and/or the management of manufacturing companies – for identification and computation of occurring costs associated with production and related activities.<sup>[5]</sup> It is part of a much wider subject called cost accountancy.<sup>[4]</sup> The *cost accounting* system of any organization is the foundation of the internal financial information system<sup>[3]</sup> providing reports/statements on profit and lost account (incomes and expenditures), the balance sheet (the financial position of the organization or firm), sources and application of funds (fund-flow).<sup>[2]</sup>

**Pricing** is the act or decision when the offered price of a given product or service is determined by the supplier (manufacturer or trader = seller). In market economy conditions prices are set according to the assumed competitive market value of the product, i.e. in comparison with similar – in terms of their function and quality – products supplied by other manufacturers and/or trader. The competitive price is usually established at retail level and the suggested ex-factory price is derived by deducting estimated margins added by all parties involved in the factory–customer chain.

Profit is the prime objective of manufacturing and trading. In order to ensure positive financial result costing and pricing should be based on thorough analysis of the cost components. Analytical cost computations may be related to



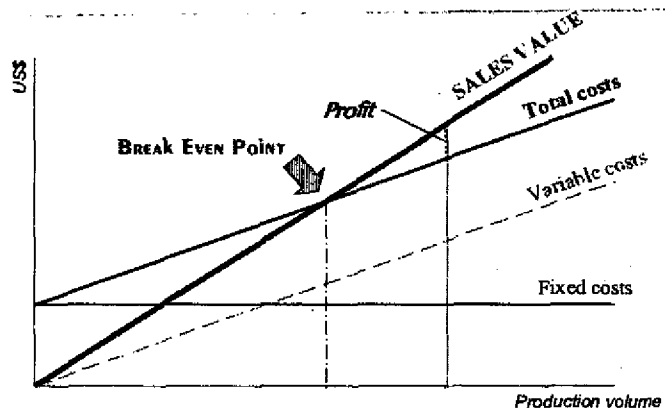
- the entire production: it is used primarily in opportunity and (pre)feasibility studies,<sup>[7]</sup> as well as by company management to find ways to reduce/eliminate expenses and thus increase profitability of the operation [8];
- individual products (units): the objective is to compare their competitiveness, requirements in resources (material and labour/capacity), contribution to the overall profit or loss made.

An example of *production costing* for 400,000 pairs/year = 1,600 pairs/day men shoe manufacturing is shown in the following table:

Component	US\$
<b>Materials</b>	4,057,500
Labour	90,000
Electricity	60,000
Fuel	15,000
Repair and maintenance	50,000
Factory overheads	108,000
<b>FACTORY COSTS</b>	<b>4,380,500</b>
<b>Administrative overheads</b>	310,000
Sales costs	25,000
<b>Distribution costs</b>	324,000
<b>OPERATING COSTS</b>	<b>5,039,500</b>
Interests	192,000
Depreciation	128,000
<b>PRODUCTION COSTS</b>	<b>5,349,500</b>

Production costs and their relation to sales revenue may also be represented in graphical form. Such an approach provides an opportunity to analyze the impact of production volume on profit produced by the company (sensitivity analysis).

$$\text{Profit} = \text{Sale} - (\text{Fixed} + \text{Variable})$$



*Product costing* is usually made at two stages in manufacturing companies: before production or sale (pre-production costing) and at the end of the fiscal year or plan period (post-production costing). The typical structure of a costing sheet is presented below:

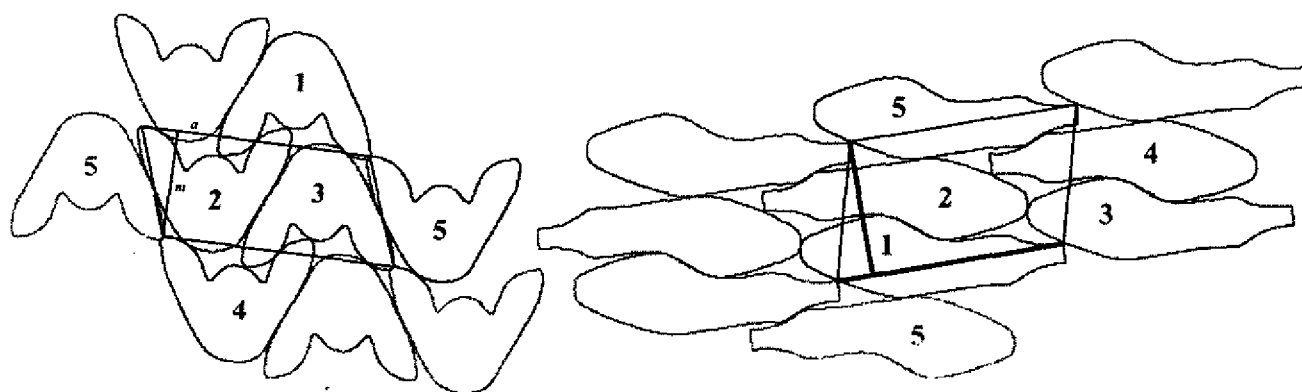
Component	Value	Unit	US\$
Direct material			7.16
Direct labour	83.0	min	1.58
Wage allowances	24.6	%	0.39
Social costs	43.1	%	0.85
Leasing costs			0.00
Manufacturing overheads	37.6	%	0.74
<i>Factory costs</i>			<i>10.72</i>
Administrative overheads	176.0	%	3.47
Depreciation			0.17
Allowances for reject	1.7		0.18
Sales costs			0.33
<i>Production costs</i>			<i>14.87</i>
Profit	8.5	%	1.26
<i>Ex-works price</i>			<i>16.13</i>
Freight/Insurance			0.87
Financial costs	1.2	%	0.20
<b>CIF (Export) PRICE</b>			<b>17.20</b>

### Material costing

Materials are direct inputs mainly procured for the product(ion), so the cost of each component or their groups (e.g. upper, lining) is computed as a product of the requirements and the corresponding unit prices. Cost of components cut from sheet materials such as genuine or simulated leather, textile/canvas, rubber, card- or leather-board should also include wastes occurring due to the configuration of patterns (first waste), the differences in edges of components and materials (side or second wastes) and imperfection of the genuine leather (fault or third wastes).

To assess the requirement in genuine leather for a specific style is normally done by determination the so-called parallelogram area (see examples below) comprising the net pattern area and the unavoidable waste among the patterns which is called *first waste*. Special algorithms (e.g. SLM – Scientific Leather Measurement, Shusterovich's method) exist for computation of *side wastes* for genuine leather, while standard percentages are used for estimating side wastes in case of man-made materials. *Fault wastes* depend on the quality (grade) of the genuine leather.

Some components (e.g. buckles, eyelets, heels, unit soles) are built in footwear construction without any (substantial) modification. Nevertheless rate of rejects in supply should be taken into consideration when their costs are added to direct materials.



### Labour costing

Direct labour costs are directly proportional to time used for performing all operations of the entire technological process. Usually standard times (norms) are allocated for each operation on the basis of time studies (industrial engineering).<sup>[8]</sup> The total time needed to produce a given style multiplied by average wages paid to operators in the company (plant) gives direct labour costs.

## SURVEY OF PRODUCTION COSTS

### Basic assumptions

Shapes (aesthetics features, form) and constructions (material composition, physical properties) of products (styles) manufactured in various countries reflect the characteristic trading pattern influencing the shoe industry sub-sector (e.g. export orientation, protection of the local market). In addition the structure of production and subsequently the product range depend also on some special conditions such as climate, availability of basic materials from local sources, purchasing power of the local population, government interventions (e.g. orders for military footwear, regulations on children shoes). Nevertheless certain types of shoes – in spite of minor formal differences – become standard products manufactured practically everywhere in the world: they offer themselves as suitable objects for comparing production costs.

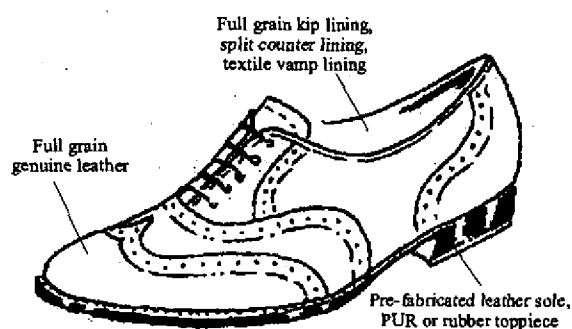
Based on such reasoning two products: Oxford men shoes and ladies athletic (sports) shoes. They feature relatively high labour content that offers good opportunities for producing them in developing countries where wages and related costs are considerable lower than in the industrialized world. International statistics available on shoe production and trade prove the validity of this assumption [9].

In order to secure cooperation of the companies ready to supply such sensitive and in fact to a great extend confidential data as production costs, no information was requested with regards prices and profits. This approach also promised an opportunity to collect real (reliable, free of “cosmetics”) data.

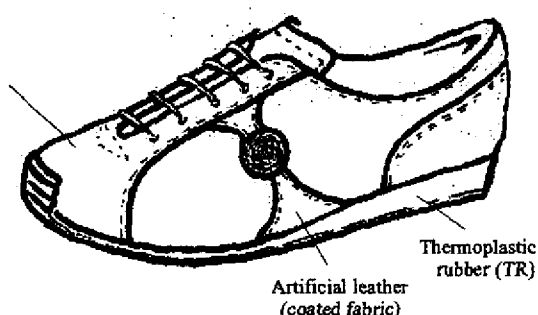
### Shoe specification

The specification below was prepared to orient those from whom data were requested on actual cost components, whereas they could use similar products manufactured earlier as source of information.

**OXFORD** - Size 42 French point = English size 8 = 280 mm



**ATHLETIC** - Size 37 French point = English size 4 = 235 mm



A letter (*Annex I*) was drafted and sent to 36 institutions and companies to request their assistance in supplying information needed for the international comparison. In addition the 16

regular and 6 honorary members of the UNIDO LEATHER AND LEATHER PRODUCTS INDUSTRY PANEL were approached for assistance in data collection. Finally several persons and/or organizations were contacted using personal relationships for the same purpose.

### Costing guidelines

Beside the textual part of the request simple guidelines in form of the following table were offered to clarify terminology and to help in collecting data.

<i>Parameter</i>	<i>Unit</i>	<i>Value</i>	<i>Explanation</i>
Average wage	\$/hour		Average wage of direct labour
Wage allowances	%		Bonus, premium etc. paid to direct labour: % of wages
Social costs	%		Insurance, taxes: % of wages + allowances
Leasing costs	\$/pair		Leasing and royalty costs
Other (special) costs	\$/pair		Special costs not included in other components
Manufacturing overheads	\$/pair		Electricity, lighting, supervision, maintenance at floor shop
<b>FACTORY COSTS</b>	\$/pair		Costs occurring at floor shop level (proportional to production)
Administrative overheads	%		Administration/management: % of direct labour + allowances
Depreciation	\$/pair		Plant (building, equipment) amortization
Allowances for rejects	%		Production losses, wastes, rejects: % of factory costs
Sales costs	\$/pair		Costs of local/domestic sales/distribution

## ANALYSIS OF PRODUCTION COSTS IN SELECTED COUNTRIES

### Database

Although the majority of costing sheets were collected or made in operational shoe manufacturing companies, as promised their names will not be revealed neither in this survey, nor at any later stage. Some countries (e.g. India, Mexico) supplied several costing examples from different firms: in such cases the most complete ones were used.

In spite of the simple yet fairly exact specifications, instructions on cost structure the costing sheets received from twelve countries are far from being uniform. However, after grouping cost components it was possible to establish a more or less uniform cost structure that is compatible to most of the costing sheets received.

In case of Oxford men shoes only two specifications could not be used at all and one appeared to be useful only for analyzing direct costs. Styles for which costing data were supplied are quite similar: all uppers are made of full grain genuine leather, but soles vary from genuine leather to PUR and PVC units.

Contrary to expectations only six costing sheets made for sports (athletic) footwear appeared to be complete enough for the present survey. Here styles, constructions, upper and sole materials vary considerably, therefore the comparison of these six examples should be assessed with special care.

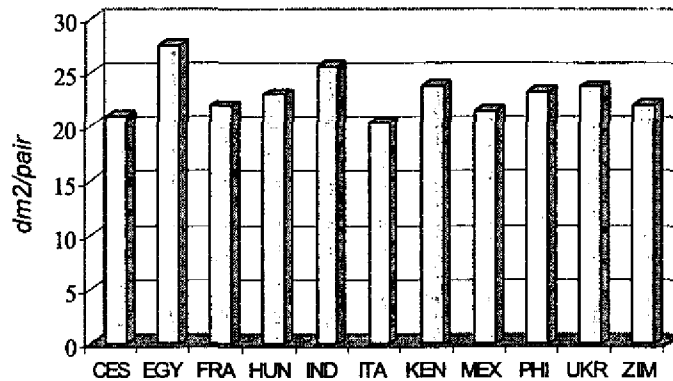
Numeric data serving for a basis for creation of the following graphs are given in table form in *Annex 2*.

### Material requirement

In case of Oxford shoes the requirement of genuine upper leather for uppers is fairly similar in different countries (see figure next page): the lowest is 21.5 dm<sup>2</sup>/pair (Italy), the highest is 25.6 dm<sup>2</sup>/pair (India). Though the range of absolute values might seem somewhat wide (54.1 dm<sup>2</sup>/pair), but the low relative value (16%) indicates that the variance is probably due to differences of leather grades and usable surfaces applied by suppliers of data.

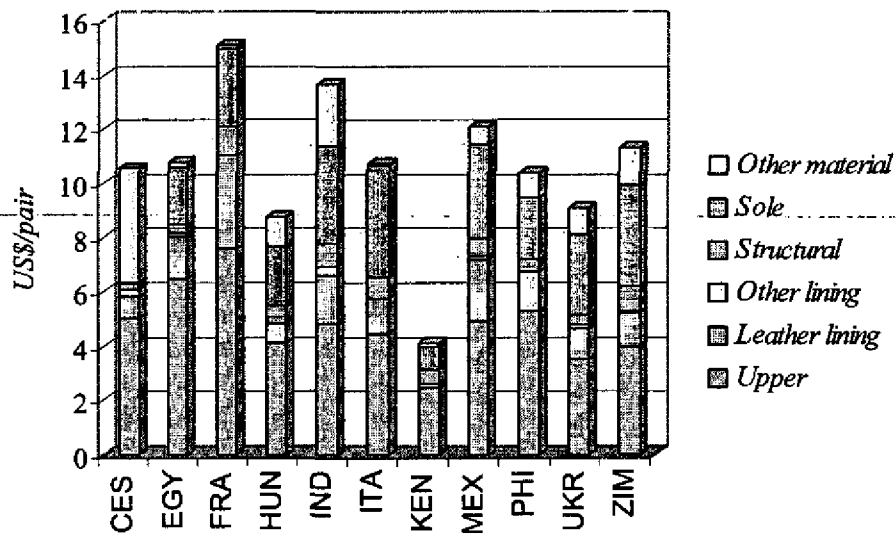
Comparison of basic materials used for uppers of athletic footwear was not possible as styles were so different and no detailed information was available on the types of materials.

**Upper leather requirement (Oxford)**



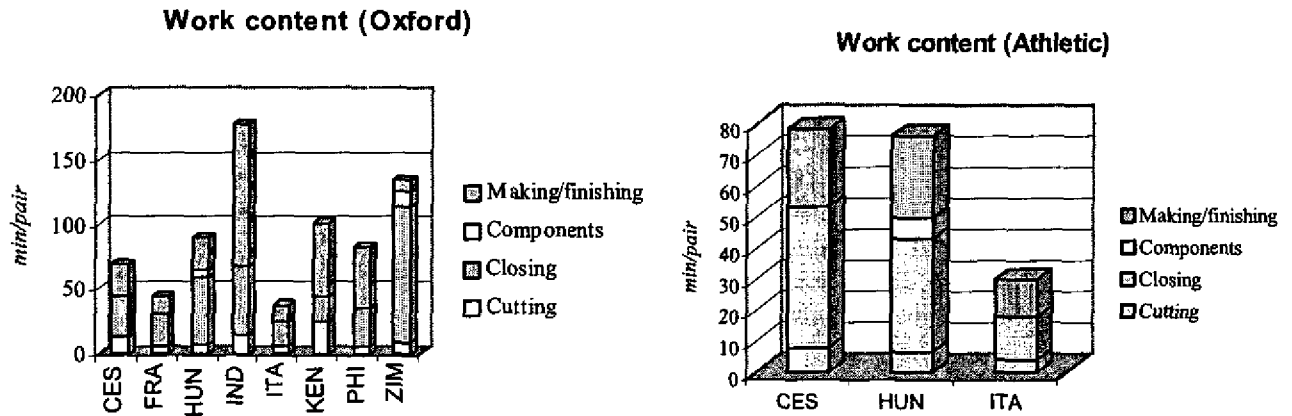
Regarding costs of materials used various parts of shoes and total (direct) material costs the differences are more visible. One of the reasons is that shoes produced in developing countries are made with unit soles (PUR or even PVC), while products with genuine leather soles – as specified in the request (like the costing received from Italy) – show higher share of this bottom component. The material costs are very low in Kenya: interestingly enough other African and Asian countries reported minimum double material costs. (Remark: structural components include insole and shank, stiffener and toe-puff.)

**Material requirement (Oxford)**



## Labour costs

Labour costs are proportional to *work content*, i.e. to the amount of human work needed to accomplish all operations of the technological process (this is the natural consequence of applying the piece-work system practically everywhere in the world). The complexity of the shoe construction is measured in standard time (in minutes – STM) allocated for the entire set of operations.



Both men dress (Oxford) and athletic shoes feature high share of closing (upper making) operations – it is well known phenomena. Apparently – and quite surprisingly – in developing countries the amount of direct labour (time) used for assembling (lasting, making/soling and finishing) is higher than that of for upper manufacturing (Zimbabwe is an exemption). The overall work content is extremely (in case of India it may even be considered as unjustified) high in developing countries: it is probably because of the lower level of mechanization and the large number of checking and cleaning (i.e. none-productive but manual) operations. Industrialized countries use far less time to produce both type of footwear due to high wages and extensive use of (prefabricated and purchased) components. Countries in transitional economies (formerly they were referred to as “centrally planned economy countries”) occupy an intermediate position in this respect.

Labour costs are normally composed from three major components:

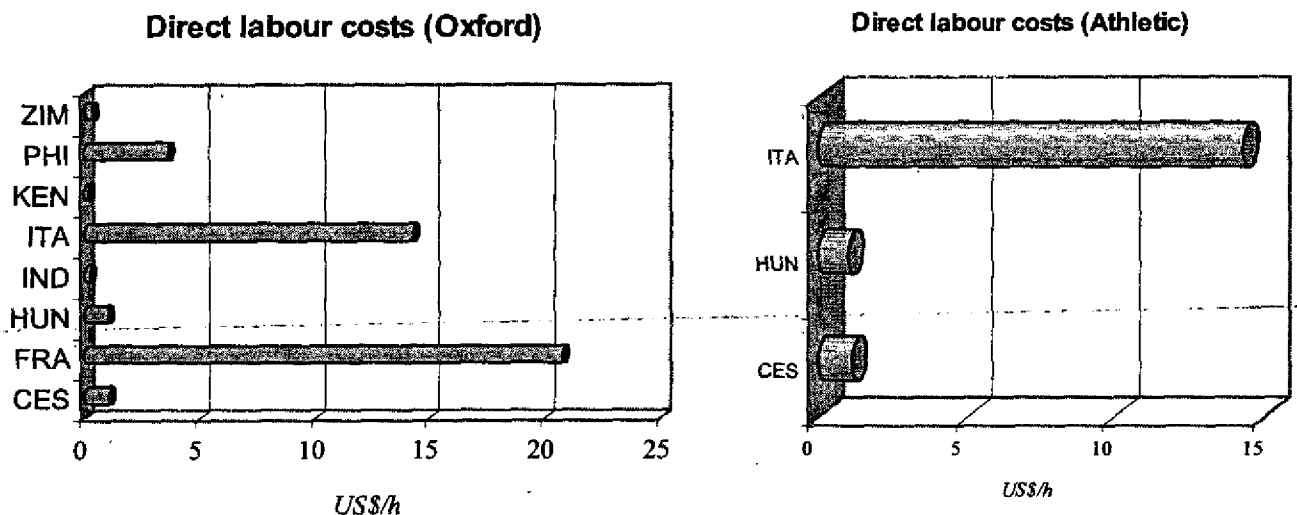
- *direct labour costs*: the financial value of operators' (workers') time used for producing one pair of the given style within the given plant conditions which is computed by multiplying the allotted or used time [min/pair] by wages [\$ /min];
- *wage allowances*: bonuses (e.g. for quality, overtime), additional salaries (e.g. 13<sup>th</sup> and 14<sup>th</sup> month), transportation and/or housing contribution;
- *labour charges* or *social costs*: paid by employers to governments and/or various funds in proportion of the payroll (e.g. health insurance, pension fund).

It is worth quoting wage allowances and especially social costs to be paid in selected countries. The following list is based on the information supplied by respondents within this particular survey (percentages [%] are of gross salary/wage paid to employees):



<b>Egypt:</b>	26% – contribution to health insurance and pension fund of employees.
<b>Hungary:</b>	33% – social/health security, 3% – unemployment fund, 1.5% – professional education levy, 3,600 HUF/employee/month = US\$ 15.05/employee/month – health insurance.
<b>India:</b>	4.75% – health insurance.
<b>Italy:</b>	45.2% – health+pension+unemployment insurance, 8.33% – additional (13 <sup>th</sup> month) salary.
<b>Philippines:</b>	8.33% – additional (13 <sup>th</sup> month) salary.
<b>Ukraine:</b>	37.5% – social security.
<b>Zimbabwe:</b>	15% – wage allowances, 7% – pension/own scheme, 2.9% – pension/national scheme, 3% – medical aid, 2.14% – manpower training levy.

Taking into consideration all these components (wherever they were available from data received) and the actual wages paid, workers' time costs generally referred as *unit direct labour costs* can be computed. The longer time used for manufacturing a pair of shoe is not only compensated by the very high wages (and their surcharges) paid in industrialized countries, but the unit labour costs remain far above those in developing countries. The following figures demonstrate clearly these differences: while one working hour of an operator costs (still without overheads) US\$ 20.70 in France and US\$ 14.30 in Italy, the same comes around US\$ 0.20 – 0.40 in developing countries (Philippines is an exemption which is difficult to explain), while one worker's hour costs about US\$ 1.00 in transitional countries. (*Remark:* reported actual exchange rates applicable at the time of submission of costing information were used for computing equivalents in US\$.)

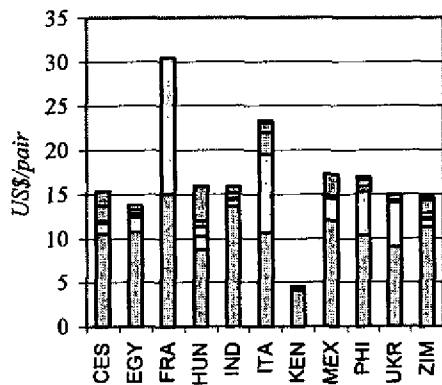


It is interesting to note that at least in case of the three countries for which costing information are available for both type of footwear – there are practically no differences between unit direct labour costs paid when manufacturing higher quality (Oxford) or relatively cheaper (athletic) shoes.

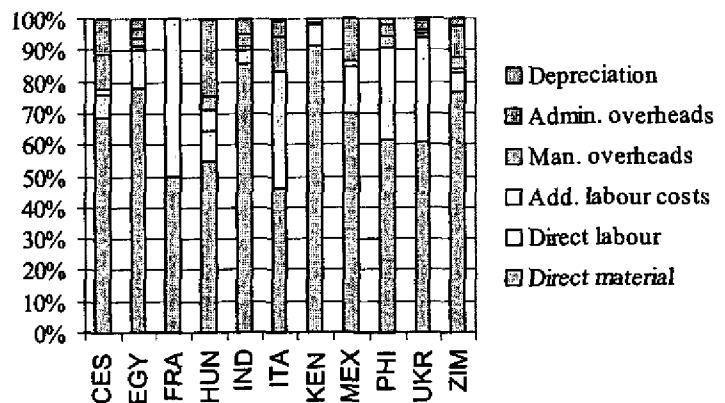
**Production cost structure**

Total production costs were computed as sum of direct (material and labour) and indirect (overhead) costs: the results are presented by the following graphs.

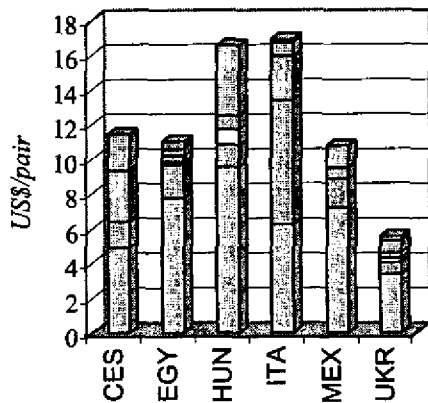
**Cost structure (Oxford)**



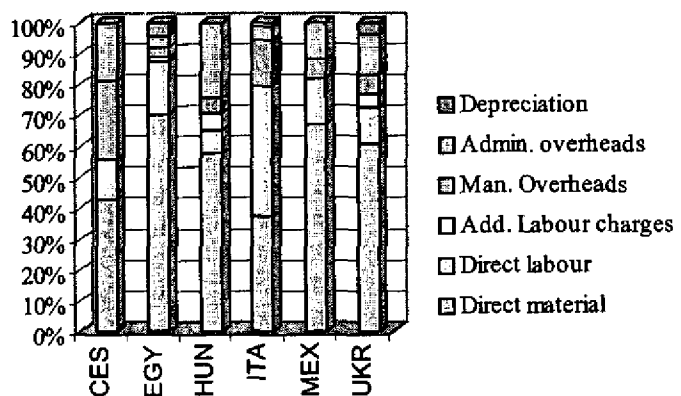
**Cost structure (Oxford)**



**Production cost structure**



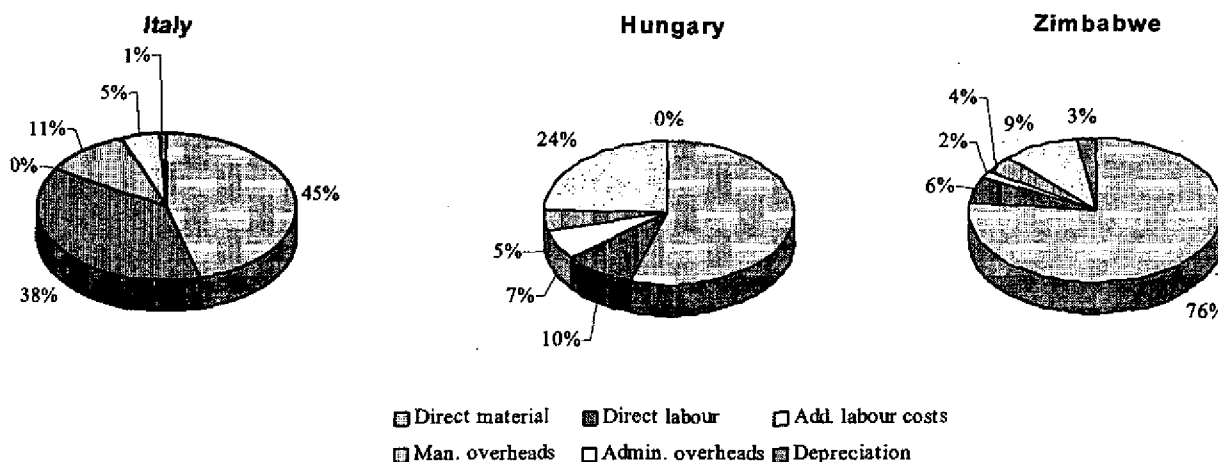
**Production cost structure (Athletic)**



In spite of enormous discrepancy between direct labour costs computed for different countries total production costs (in fact ex-factory prices less profit) show much less variation. Obviously production of quality (Oxford) shoes is most costly in France: only direct material and labour comes to US\$ 30.45/pair – more than total costs in Italy (US\$ 23.33/pair). Total production costs of men dress shoes manufactured in Czech Republic, Egypt (!), Hungary, India (!), Mexico, Philippines (!!), Ukraine (!! ) and Zimbabwe (!! ) are fairly close to each other: they range between US\$ 12.81/pair and US\$ 17.27. (Data received from Kenya – US\$ 4.51/pair – seem to be rather unrealistic.)

It is interesting to compare cost structures of three different countries such as Italy (industrialized), Hungary (in transition) and Zimbabwe (developing). In Italy labour costs make 38%, in Hungary 10% and in Zimbabwe only 6% of the total production costs. Materials make more than half of total costs in Hungary and Zimbabwe: that is why companies in transitional and developing countries prefer job work. The high share of administrative overheads in Hungary

shows that countries in transitional economies retain management practice adopted when they had centrally planned economy systems.



Actual total costs depend very much on material costs. Living conditions improve everywhere in the world (compared to the past), wages and salaries show an increasing trend. The history of shoe industry observed in emerging countries during the last 20-30 years proves that labour costs are also increasing. Production of footwear – especially due to slow technical development in upper making – remains one of the labour intensive operations, therefore entrepreneurs will look for cheaper opportunities, i.e. countries and/or regions where wages are lower.

## Prices

Though it was not the objective of this survey to deal with price structures (and thus with profits), nevertheless some information could be collected in this respect.

*Prices and costs* are no doubt related, but the margin between them may vary according to specific economic conditions and objectives of business. Certain styles or products may not produce any profit (some of them may even cause losses) in financial terms, but they are manufactured to absorb overheads, to keep contacts with important clients, to sell other styles bringing good profit and/or to serve other business objectives (e.g. market promotion).

*Profit* is the real secret of business, so it is almost impossible to get reliable data in this respect. (Of course several consultants and institutions – including UNIDO – have been involved in projects dealing with feasibility studies, marketing production management whereby such information was used but they are property of the assisted ventures and cannot be disclosed.) It is estimated that within normal circumstances and in a competitive market environment free of distortion (e.g. protection, subsidy) footwear manufacturing companies are making profit on common types of shoes about 7-10% profit relative to sales (ex-factory) prices.

## **COSTING PRACTICES**

### Data acquisition for costing

Consistency of any kind of calculations depend basically on the reliability of input data. The following key elements interpreted or used improperly may result quite disappointing results:

#### a) **Direct material costs**

- There is no optimum parallelogram, i.e. first waste determined manually depends on the skills and experience of the technologist or one the algorithm used by the CAD system.
- Third waste is directly related to grading of leather, which is based on subjective judgment of the quality checker, so it is a good practice to grade incoming genuine leather in the shoe factory according to internal standards.
- Unit prices of materials and components kept relatively long on stock should be regularly adjusted to actual purchase prices and to the inflation.

#### b) **Direct labour costs**

- Work content should be based – to the extend possible – on time studies (STMs).
- Bonuses (e.g. for quality, material savings) and additional payments made to direct labour should be taken into consideration.
- Only payments proportional to wages and paid by the employer/company (e.g. social security) should be added as labour surcharges.

#### c) **Overheads**

- Factory costs (including salaries and surcharges paid to supervisors/foremen, quality controllers, technicians etc. attached to production units/lines) should be separated from general or administrative overheads.
- It is worth separating depreciation from other types of overheads.

### Costing computation

Costing involves fairly simple arithmetic calculation: computing overhead shares and adding cost components. Fairly good schemes can be implemented using simple spreadsheet programs (e.g. ©MS-Excel, ©Lotus-123). All footwear CAD systems available today on the market have integrated functions or related program packages dealing with costing (e.g. ©ShoeMaster Costing+, ©Gestor). There are special programs made for doing nothing but costing and price setting: the majority of them were tailor-made to specific companies or (small) businesses – in many cases as part of the production control, accounting or financial systems – are not marketed.

The following figures demonstrate the main functions of a stand-alone program (©ShoeCost) made by TECHNOORG CONSULTING primarily (but not exclusively) for small-scale shoe manufacturing units. It needs standard personal computers (PC) and runs under ©Windows operating system.

The program stores (on disk) some standard data named *costing parameters* which is used for costing individual styles (products) during a certain period of time. Altogether ten (10) sets can be stored and selected freely for actual costing.

Calculating Parameters			
Foreign Currency:	US\$	Exchange rate	239.20 FT/US\$
Average wage	243.30 FT/hour	Sales costs	6.40 FT/pair
Wage allowances	22.20 %	Export incentive	0.00 %
Social costs	47.70 %	F.O.B. PRICE	
Leasing costs	0.00 FT/pair	Freight/Insurance	94.52 FT/pair
Other (special) costs	0.00 FT/pair	Financial costs	3.20 %
Manufacturing overheads	134.80 %	C.I.F. PRICE	
<b>FACTORY COSTS</b>		Wholesale/retail margin	125.00 %
Administrative overheads	223.70 %	Computed retail price (netto)	
Depreciation	36.31 FT/pair	Value Added Tax (VAT)	25.00 %
Allowances for rejects	1.50 %	Suggested retail price (brutto)	
Selling costs	73.25 FT/pair	Comment:	Export US
Profit	9.72 %		
<b>EX-WORKS PRICE</b>			1/10
Maximum three letter abbreviation of the foreign currency in which exported goods are paid.			Done

Similarly *cutting value* (= 100% - fault wastes) of different grades of genuine leather are also stored and used as standard inputs:

Useable Leather Area		
0 →	100	%
1 →	97	%
2 →	92.5	%
3 →	87	%
4 →	80	%
5 →	70	%
6 →	55	%

OK

*Materials* are entered by components (or their homogenous groups such as upper, lining etc.) together with their parameters (e.g. measurement unit, size, grade, unit price). The program distinguishes three kinds of materials:

a) genuine leather;

Specification		Total material cost: 2.091.31 FT/pair	
Component	Upper	Complete	
Material	Misina full grain	Kind of material	<input checked="" type="radio"/> Genuine leather
Color	Braun		<input type="radio"/> Leather substitute to be cut
Unit of measur.	dm <sup>2</sup>		<input type="radio"/> Purchased/others
Unit price	43.6 FT/dm <sup>2</sup>		
Ave. leather a.	154 dm <sup>2</sup> /pc	Requirement	22.54 dm <sup>2</sup> /pair
Leather grade	2		
Cutting waste	26.73 %		
Net pattern	16.59 dm <sup>2</sup> /pair	Material cost:	537.10 FT/pair
Parallel area	17.97 dm <sup>2</sup> /pair		
No. of comp.	14 pc/pair		
		Exit	
		Delete	
		Add	

b) leather substitute to be cut in the shoe manufacturing plant (e.g. textile, rubber, leather board);

Specification		Total material cost: 2.091.31 FT/pair	
Component	Reinforcement	Interlining	
Material	GraboTherm	Kind of material	<input type="radio"/> Genuine leather
Color			<input checked="" type="radio"/> Leather substitute to be cut
Unit of measur.	dm <sup>2</sup>		<input type="radio"/> Purchased/others
Unit price	4.72 FT/dm <sup>2</sup>		
Ave. leather a.	dm <sup>2</sup> /pc	Requirement	4.99 dm <sup>2</sup> /pair
Leather grade			
Cutting waste	17.2 %		
Net pattern	3.6 dm <sup>2</sup> /pair	Material cost:	23.55 FT/pair
Parallel area	4.13 dm <sup>2</sup> /pair		
No. of comp.	6 pc/pair		
		Exit	
		Delete	
		Add	

c) purchased (e.g. unit soles, laces, thread ).

**Specification** [X]

Total material cost: 2.091.31 FT/ pair

Component	Stiffener	
Material	1124 thermo	Kind of material: <input type="radio"/> Genuine leather
Color		<input type="radio"/> Leather substitute to be cut
Unit of measur.	pair	<input checked="" type="radio"/> Purchased/others
Unit price	67 FT/pair	
Ave. leather a.	pair/pc	
Leather grade		Requirement: [Exit]
Cutting waste	% 1.03 pair/pair	[Delete]
Net pattern	pair/pair	Material cost: [Add]
Parallel area	pair/pair	ES.01 FT/pair
No. of comp.	pc/pair	

Work content can be entered by major phases of production (e.g. cutting, upper making, lasting, finishing) or as a global capacity requirement in STM. (The following picture shows the program interface behind the actual data entry window.)

**Labour Content** [X]

Cutting:	8	Lasting:	0
Skiving:	0	Sole laying:	0
Component manufacturing:	4	Finishing:	0
Upper manufacturing:	52	Assembling:	26
Component preparation:	0	Other:	0
Closing:	0		

Labour content [min/pair]: 90

[Ok] [Cancel]

Actual costing computation starts with using standard costing parameters, recently entered direct material and work content data. The program produces the initial costing sheet and shows its main components together with eight possible ways to intervene.



Calculation		Current selection		Min price	MAX PROFIT
Parameter:	Export US	0	0	0	0
		FT	US\$		
1	Material (direct)	2091.31	8.74	2091.31	2091.31
2	Labour (direct)	364.95	1.53	364.95	364.95
3	Other (special) costs	0.00	0.00	0.00	0.00
	FACTORY COSTS	3351.18	14.01	3351.18	3351.18
4	Profit	485.42	2.03	485.42	485.42
5	EX-WORKS PRICE	4994.06	20.88	4994.06	4994.06
6	F.O.B. PRICE	5000.46	20.90	5000.46	5000.46
7	C.I.F. PRICE	5263.41	22.00	5263.41	5263.41
	Computed retail price (netto)	11236.64	46.98	11236.64	11236.64
	Price (brutto)	14045.90			
8	Suggested retail price (brutto)	0			

Comment:

Basic calculation (with the model's original data)

Cost Print

Done

Sci. Print

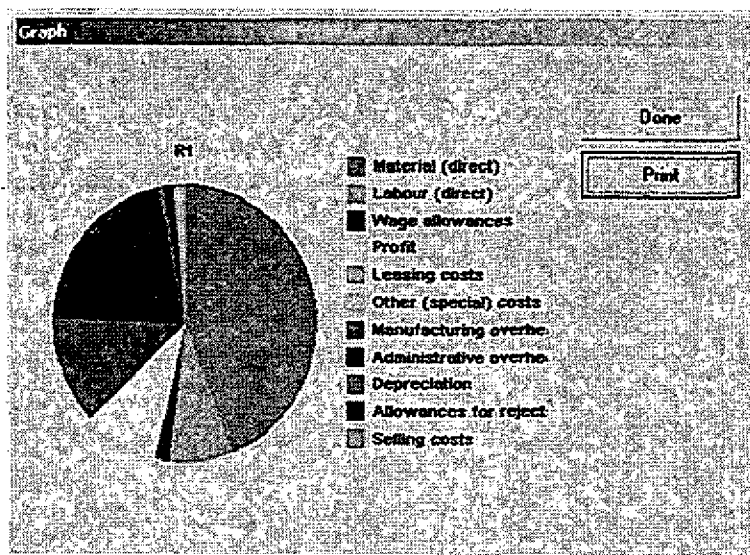
Graph

By pressing any of the eight buttons on the left margin of the screen the respective cost component can be changed. In case of changing direct material or labour costs the program returns to the component specification or the work content window whereby any of the actual data (e.g. material unit price, net/parallelogram area) can be modified. Any changes made will initiate automatic recalculation of the costing sheet, the new variant is produced and shown on the screen. Each change is numbered and can hold one line comment to remind the operator for the reason or action taken. The screen always shows three variants: the result of the most recent calculation (left) or browsed selection, the one resulted the lowest price and the one resulted the highest profit (in absolute monetary terms). Thus the program is not only generating costing information; it computes prices of different nature and its interactive engine can be used in price negotiations as well.



Calculation					
Parameter	Export US	Current selection		Min price	MAX PROFIT
		1	US\$	0	1
		FT	US\$		
1	Material (direct)	2091.31	8.74	2091.31	2091.31
2	Labour (direct)	364.95	1.53	364.95	364.95
3	Other (special) costs	0.00	0.00	0.00	0.00
	<b>FACTORY COSTS</b>	<b>3351.18</b>	<b>14.01</b>	<b>3351.18</b>	<b>3351.18</b>
4	Profit	627.76	2.62	495.42	627.76
5	<b>EX-WORKS PRICE</b>	<b>5136.40</b>	<b>21.47</b>	<b>4334.06</b>	<b>5136.40</b>
6	<b>F.O.B. PRICE</b>	<b>5142.80</b>	<b>21.50</b>	<b>5000.46</b>	<b>5142.80</b>
7	<b>C.I.F. PRICE</b>	<b>5410.45</b>	<b>22.62</b>	<b>5268.41</b>	<b>5410.45</b>
	Computed retail price (netto)	11556.90	48.31	11236.64	11556.90
	Price (brutto)	14446.13			
8	Suggested retail price (brutto)	<input type="text" value="0"/>			<input type="button" value="Cost Print"/>
				<input type="button" value="Done"/>	<input type="button" value="Scr Print"/>
Comment					
					<input type="button" value="Graph"/>

One of the useful features of the program is to illustrate cost and price components in a graphical (pie-chart) form.



Sample printed costing reports produced by the TECHNORG ShoeCost program are enclosed in Annex 3.

## CONCLUSIONS

Costing is an inevitable function when building product ranges, analyzing its competitiveness, establishing a pricing policy, evaluating products (styles) manufactured and marketed in the past (e.g. during the last season, year). This activity may look like part of financial control of the business, in reality it is very closely related to technical aspects of the manufacturing process. No producer entering into (free) markets can afford to base his decisions with regards product development and sale on guesses or rough estimates. Success of shoe (and other leather-based products) manufacturers in developing countries depend on how careful they are in reducing their production costs and in selecting feasible styles for sales.

The survey, in spite of its obvious limitations, proved that manufacturing costs are important reasons for shifting footwear manufacturing capacities toward countries where wages – as a substantial cost component – are lower. At the same time it also became apparent, that low direct labour costs alone do *not* attract interest of brand owners and distributors. Similarly (if not even more) significant factors govern decisions of investors and especially large multinational companies which turned from producers into traders on sourcing their shoes from developing or transitional countries.<sup>[10]</sup> Such aspects include:

- d) physical and financial infrastructure;
- e) conditions of the local labor force (discipline);
- f) industrial climate and supporting administration;
- g) actual fashion and market trends;
- h) international logistics.

Though data collection on footwear costing from a wide range of countries and operations is an extremely difficult task, nevertheless further surveys dealing with overhead calculation, use of various computer programs and integration of costing into technical and marketing activities – especially in developing countries and in small-scale businesses – promises additional interesting information. UNIDO is probably the only (international) organization featuring independence (thus impartiality and reliability) and widespread contacts in a large number of countries, which qualifies it to undertake such a research.

## References

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## TEXT OF THE REQUEST FOR COSTING INFORMATION

**SUBJECT: Shoe Production Cost Analysis**

Dear ....

We are in the process of preparing the 14th Session of the UNIDO LEATHER AND LEATHER PRODUCTS INDUSTRY PANEL to be held in Istanbul, Turkey, 6-11 September 1999. (The LEATHER PANEL is an advisory body to the UNIDO Secretariat. Its 20 regular and 6 honorary members represent government offices, private entrepreneurs, institutes, manufacturers, professional associations, UN specialized agencies, and international organizations active in leather processing, footwear and other leather products manufacturing in 22 countries of the world.) One of the agenda items of the forthcoming meeting is to compare actual production costs of shoe manufacturing in various regions of the world and review economic factors promoting or hindering the production of footwear in different countries. UNIDO is now collecting information to prepare the respective survey.

Men's casual and sports shoes constitute the majority of footwear (or their uppers) produced in and exported by developing countries. In order to make the cost evaluation consistent, two basic styles have been selected (see attached sketches). The two styles are relatively standard so it is hoped that very similar products can easily be found in a wide range of countries/companies. Our intention is to request selected companies/plants to provide us either with the cost of the two attached styles or with the costing of a similar style from their own range.

I would appreciate it if you could obtain the following data for the two types:

- a) style drawing/sketch or photo (if existing styles are used and they are different from those shown on the enclosed specifications);
- b) list of components and materials used to manufacture that particular style;
- c) material requirement of one pair by components;
- d) unit price of materials/components used;
- e) labour content (in seconds or minutes) required for producing these particular shoes (if possible/available by main phases such as cutting, closing, bottom-stock preparation, lasting + making, finishing) and or the cost of direct (physical) work.

With regard to costing, we would like to receive information in the following structure:

- direct labour (wages paid to workers),
- wage allowances (bonus, premium etc. paid to workers on top of wages - e.g. for quality),
- manufacturing overheads (electricity/utilities, lighting, supervision, maintenance, cleaning etc. occurring on the shop-flow level),
- administrative overheads (administration, management, communications, promotion, marketing etc.),
- depreciation (plant - including building, equipment),
- other costs (not indicated above, e.g. royalties, rent).

All the above costs (components) are related to the two sample products. In addition, we would like to have an indicative list of tax (i.e. payments made to the government, local authorities), which are paid:

- a) by the employees out of the (gross) wage/salary received from the employer (company) for the job done (e.g. health/unemployment insurance, pension fund);
- b) by the employer (company) besides wages/salaries (e.g. health/unemployment insurance, legal).

Finally, we would like to know the size of the company from which this information was collected (e.g. daily production or number of employees) as well as the actual exchange rate of the local currency to the US dollar.

We are *not*, repeat *not*, interested in the name of the company where the above data is coming from - even if we know we will never make any reference to it. As you can see, we are not interested in any company secrets and whatever data we receive will be handled confidentially regarding the source.

I appreciate the problems and workload associated with getting the requested information. In order to assist you in collecting the relevant information and clarifying practical questions, I could come for 1-2 days sometime in June or July and visit the actual source of the information (perhaps together with you). For this I need an indication from you as soon as possible so I can make the necessary travel arrangements.

In return for your efforts and those of the immediate source of information (i.e. selected company), I would give you a copy of the survey made on the basis of the data collected and the information on the outcome of the discussions held during the LEATHER PANEL meeting.

I am fully aware that my request is unusual and requires a great deal of effort from you. I would, therefore, be very grateful if you could assist us in collecting this data and compiling a comprehensive survey which may be of assistance to the world footwear trade in assessing the recent developments in global trade and make decisions regarding future trends. An early e-mail message or fax reply to this request would be greatly appreciated - whether you contribute to this issue or not.

Thanking you in advance for your kind assistance and cooperation in this matter, I remain

Sincerely yours,

Ferenc Schmél  
*Industrial Development Officer*  
 Agro-Industries and Sectoral Support Branch, Leather Unit  
 Sectoral Support and Environmental Sustainability Division

## NUMERIC INFORMATION COLLECTED ON FOOTWEAR COSTING

### Genuine leather used for Oxford-type shoe upper

Country	Abbreviation	dm <sup>2</sup> /pair
Czech Republic	CES	20.86
Egypt	EGY	27.41
France	FRA	21.88
Hungary	HUN	22.93
India	IND	25.55
Italy	ITA	20.30
Kenya	KEN	23.78
Mexico	MEX	21.50
Philippines	PHI	23.23
Ukraine	UKR	23.64
Zimbabwe	ZIM	22.00

### Cost of shoe components

Oxford										US\$/pair	
Material	CES	EGY	FRA	HUN	IND	ITA	KEN	MEX	PHI	UKR	ZIM
Upper	5.00	6.47	7.58	4.12	4.81	4.46	2.45	4.88	5.31	3.55	4.00
Leather lining	0.78	1.56	3.44		1.78	1.26		2.30		1.11	1.20
Other lining	0.30	0.13		0.71	0.32		0.14	0.13	1.39	0.11	0.05
Structural*	0.18	0.30	1.09	0.65	0.86	0.79	0.53	0.66	0.50	0.40	0.95
Sole	0.05	2.12	2.83	2.17	3.57	4.13	0.83	3.46	2.25	2.91	3.73
Other material	4.24	0.22	0.14	1.09	2.31	0.06	0.16	0.65	0.92	1.00	1.37

\*Remark: Structural includes insole, shank, stiffener and toe-puff.

### Work content

Oxford									min/pair
	CES	FRA	HUN	IND	ITA	KEN	PHI	ZIM	
Cutting	12.21	5.70	7.20	14.00	5.00	24.00	5.00	8.75	
Closing	31.72	25.10	51.84	53.00	20.00	19.20	30.00	105.17	
Components			5.34					10.92	
Making/finishing	24.56	13.55	25.52	110.00	12.00	57.60	47.00	8.83	
<b>Total</b>	<b>68.49</b>	<b>44.35</b>	<b>89.90</b>	<b>177.00</b>	<b>37.00</b>	<b>100.80</b>	<b>82.00</b>	<b>133.67</b>	

Athletic		<i>min/pair</i>		
	CES	HUN	ITA	
Cutting	7.81	6.57	4.00	
Closing	45.68	36.63	14.00	
Components		6.74		
Making/finishing	24.80	26.23	12.00	
<b>Total</b>	<b>78.29</b>	<b>76.17</b>	<b>30.00</b>	

## Production costs

Oxford		<i>US\$/pair</i>									
	CES	EGY	FRA	HUN	IND	ITA	KEN	MEX	PHI	UKR	ZIM
Direct material	10.55	10.80	15.08	8.74	13.65	10.70	4.11	12.08	10.37	9.08	11.30
Direct labour	1.22	1.67	15.37	1.53	0.71	8.82	0.31	2.49	5.00	5.00	0.84
Add. labour costs	0.28	0.13		1.07				0.32		0.15	0.24
Man. overheads	1.69	0.33		0.74	0.18	2.54	0.02		0.63	0.20	0.52
Admin. overheads	1.67	0.42		3.90	0.60	1.06	0.06	2.38	0.63	0.44	1.44
Depreciation		0.46			0.78	0.21			0.35	0.13	0.37
<b>Production costs</b>	<b>15.41</b>	<b>13.81</b>		<b>15.98</b>	<b>15.92</b>	<b>23.33</b>	<b>4.51</b>	<b>17.27</b>	<b>16.98</b>	<b>15.00</b>	<b>14.70</b>

Athletic		<i>US\$/pair</i>				
	CES	EGY	HUN	ITA	MEX	UKR
Direct material	4.91	7.75	9.54	6.25	7.24	3.39
Direct labour	1.48	1.96	1.29	7.15	1.62	0.65
Add. labour charges		0.13	0.90			0.25
Man. overheads	2.95	0.33	0.77	2.54	0.65	0.32
Admin. overheads	2.10	0.42	4.05	0.79	1.27	0.72
Depreciation		0.46		0.16		0.22
<b>Production costs</b>	<b>11.44</b>	<b>11.05</b>	<b>16.55</b>	<b>16.89</b>	<b>10.78</b>	<b>5.55</b>

		<i>US\$/min</i>	
Country	Abbrev.	Direct labour costs	
		Oxford	Athletic
Czech Republic	CES	1.07	1.13
France	FRA	20.79	
Hungary	HUN	1.02	1.02
India	IND	0.24	
Italy	ITA	14.30	14.30
Kenya	KEN	0.19	
Philippines	PHI	3.66	
Zimbabwe	ZIM	0.38	