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**COMFAR ECBA**

**USER'S GUIDE AND REFERENCE MANUAL**

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674

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## INTRODUCTION TO COMFAR ECBA

COMFAR ECBA is designed to facilitate an economic impact analysis of industrial projects.

Like all COMFAR modules it is designed to operate in a dialogue mode that guides the user step by step through the individual phases of the programme. In case difficulties should occur, an on-line help manual is available. It can be activated by pressing the F9 key.

However, as in most cases only financial project evaluation is undertaken, the user might not be acquainted to shadow pricing, foreign exchange rate adjustments, the definition and evaluation of externalities e.a. Therefore it is strongly suggested to read this User's Guide and Reference Manual and eventually the corresponding chapters of the UNIDO Manuals prior to starting COMFAR ECBA.

It must be emphasized that computation errors in economic project evaluation, if they occur as a result of COMFAR ECBA computations, most likely originate from misunderstandings and misinterpretations of the methodology underlying COMFAR ECBA.

Special attention must be paid to the prevention of

### DOUBLE COUNTING.

BE SURE THAT DATA ARE ONLY ENTERED ONCE AND CHECK THOROUGHLY WHICH KIND OF ADJUSTMENTS HAVE ALREADY BEEN CARRIED OUT IN PREVIOUS STEPS AND WHICH CORRECTIONS WILL BE MADE BY COMFAR AUTOMATICALLY.

In case of doubts, sketch the flows of inputs and outputs on a separate piece of paper.

It must be pointed out that COMFAR ECBA cannot cover the whole spectrum of economic analysis. Considering all possible methodologies on economic evaluation, it would certainly exceed the frame of a computer programme. But COMFAR ECBA is in any case a powerful and easy-to-handle tool for arriving at national profitability criteria.

However,  
figures need to be analysed and interpreted  
or Cost-Benefit-Analysis might degenerate into  
a meaningless mechanical routine!

**COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA**

**1. GENERAL INFORMATION ON COMFAR ECBA  
(ECONOMIC COST BENEFIT ANALYSIS)**

**1.1. ORGANIZATION OF THE ECBA USER'S GUIDE**

The present volume represents Chapter VI of the COMFAR 2.1 User's Guide and Reference Manual. Chapters I through V covering the COMFAR main system and COMFAR GRAFIX have been published as a separate volume.

It is assumed that the user is already familiar with COMFAR. Therefore the operation of the programme will not be explained in detail. Only those features which are new in COMFAR ECBA will be highlighted.

Although COMFAR ECBA is fairly selfdescriptive, it is strongly recommended to consult the User's Guide before starting with the programme.

With regard to the methodology applied, there will be brief explanations given within this documentation. Whenever appropriate, references will be given to the UNIDO Manuals or other text passages. For the sake of brevity only reference numbers in [ ] will be in this text. They will be explained in the List of Cross References in Annex II.

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

In Subchapter 1 of the present volume a brief introduction to COMFAR ECBA and the Economic Cost Benefit Analysis in general will be given.

Subchapter 2 gives useful hints on how to operate COMFAR ECBA. Options available in COMFAR ECBA are listed in alphabetic order in subchapter 2.4.

In Subchapters 3 through 5 the salient phases of COMFAR ECBA, namely the data adjustments, are presented. Viz:

data arrangement  
preliminary adjustment  
foreign exchange rate adjustment

For every adjustment the procedure is explained and reasons for and justification of the procedure in question are given.

In Subchapter 6 computation and reporting of results are described and brief explanations will be presented.

In Subchapter 7 a case study will be carried out. Based on the amended UNIDO case the individual steps of COMFAR ECBA will be explained in detail.

Annex I and Annex II provide a List of Cross References and a Glossary of Important Terms, respectively. In Annex III selected schedules of COMFAR ECBA are presented.

### 1.2. OBJECTIVES AND JUSTIFICATION OF ECONOMIC COST-BENEFIT ANALYSIS

Commercial project evaluation only considers input from and output to the investor but does not regard the contribution of a project to the economy of the country.

Projects commercially viable need not necessarily be economically viable and vice versa. But, as especially in developing countries capital is a scarce resource, the economic impact is of utmost importance.

The objective of economic impact analysis is to reflect more accurately the true economic contribution of the project and to facilitate optimal investment decisions from the national point of view.

The main differences between commercial and economic evaluation, as presented here, are chiefly the following:

1. In economic evaluation projects are assessed under different aspects than in commercial evaluation. Whereas in commercial evaluation the costs and benefits of the investor are concerned, economic project evaluation takes into account the costs and benefits of the society of the country.

For example, indirect taxes on inputs are costs for the investor but not for the economy: they are transfer payments within the country, i.e. from the investor to the government.



2. In commercial project evaluation input and output are priced at their market prices. Yet, due to market distortions, market prices do not reflect true economic costs and benefits. Therefore they are adjusted to shadow prices in economic analysis.
3. The definition of costs and benefits is wider in economic analysis. Beside direct monetary flows, indirect (linkage) effects are also taken into account.

In principle costs and benefits can be identified as either:

**DIRECT OR INDIRECT**

as well as either:

**TANGIBLE OR INTANGIBLE**  
(monetary)      (non-monetary)

However, there is no strict borderline between tangible and intangible costs/benefits. Even though a project might, for example, cause some kind of pollution, which does not involve monetary flows at first, it might incur monetary costs in some later instance.

Commercial analysis takes into account the direct tangible costs and benefits only, as it assesses the net financial result of a project to the investor. Whereas for economic profitability also the other categories of costs and benefits (direct intangible, indirect tangible and intangible) may be relevant.

### 1.3. METHODOLOGY UNDERLYING THE COMFAR ECBA MODULE

The ECBA module mainly applies the methodology introduced in the UNIDO's Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries (publ. No. E.78.II.B.3) and the UNIDO's Manual for Evaluation of Industrial Projects (publ. No. E.80.II.B.2).

Since their release, both manuals have set a certain standard in economic project evaluation. Their methodologies have been widely accepted and applied.

According to the UNIDO's Guide to Practical Project Appraisal, COMFAR ECBA calculates the project's Net Present Values, and Economic Rate of Returns [ 1]. Actually the same methodology as in commercial analysis is applied here, except that, instead of using market prices, preliminary price adjustments (economic analysis - step 1) and foreign exchange rate adjustments (economic analysis - step 2) are undertaken. Moreover, transfer payments are treated differently and externalities can be imputed for both steps.

The methodology concerning the Absolute Efficiency Test [ 2], the Net Foreign Exchange Effect [ 3] and the Distribution of National Value Added [ 4] has been adopted from the UNIDO's Manual for Evaluation of Industrial Projects.

In the Absolute Efficiency Test the value added criterion comes into application. It is measured whether the project also yields a surplus over the wages. I.e. if the output from operation is higher than the sum of material inputs (intermediates), investment depreciated and wages.

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

The Net Foreign Exchange Effect assesses the effect of the project on the foreign exchange position of a country. Both, the effect on the country's balance of payment, and the effect of import substitutions are measured.

Distribution of National Value Added depicts which social groups will benefit from the project. It assesses whether the value added of the project goes mainly to workers, by means of wages, to the government, by means of taxes, to financing institutions and share-holders, by means of interests and profit, or whether it remains undistributed, increasing the value of the enterprise.

## 2. HOW TO OPERATE COMFAR ECBA

### 2.1. LOADING COMFAR ECBA TO THE HARD DISK

Before the COMFAR ECBA can be loaded, the main system of COMFAR must already be installed on the hard disk!

Like the COMFAR main system and COMFAR GRAFIX, the COMFAR ECBA programme disk contains a batch file for copying the ECBA module to the hard disk. For installing COMFAR ECBA proceed as follows:

Insert the COMFAR ECBA programme disk into the floppy disk drive of your computer and close the drive.

Then:

enter A:LDEBC  
press RETURN

To continue, follow the instructions displayed on the screen.

## 2.2. EXECUTION AND CLOSURE OF COMFAR ECBA

For the execution of COMFAR ECBA proceed in the same manner as when starting the COMFAR main system [ 5] or COMFAR GRAFIX:

```
change directory : cd\comfar
type             : comfar
choose dialogue language
enter new date
press            : RETURN
choose ECBA with : F3
```

To terminate COMFAR ECBA, follow the dialogue instructions on your screen. If Q(uit), EXIT, or RETURN are not offered yet, follow the instructions until one of the Quit options will be available in the command line.

Quit does not bring you to the end of COMFAR ECBA immediately, but would bring you up step by step to the highest hierarchial level of the programme.

**CAUTION:**  
Save the adjusted table before terminating  
COMFAR ECBA!

In case the programme gets stuck during a session and Quit is not offered or does not work, try CTRL-C to interrupt the session. If this does not work either, you would have to reset your computer. Since the ECBA programme stores all information in a permanent memory, no data should get lost if the computer is reset during a session. Nevertheless it is suggested to review your data before continuing.

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

When starting the ECBA module, COMFAR will offer you the following menu:

```
COMFAR - ECBA

F1 SOURCE, current table [    ]
F2 FILE with adjustments [    ]
   P...current printer [parallel]
   M...current mode    [ display]
   L...report language [ english]

F3 SHOW schedules
F4 ADJUST file
F8 SAVE adjustments file
F9 HELP
F10 RETURN to previous menu
```

Subsequently this menu will be referred to as Main-Menu.

Press P to switch the current printer between [parallel] and [serial], press M to choose the desired mode (display or printer) and press L to choose the report language if you have required more than one.

Whenever appropriate the individual function keys will be explained in detail in the corresponding chapters.

An alphabetic listing with brief explanations of the COMFAR ECBA options is given in subchapter 2.4.

### 2.3. THE COMFAR ECBA DATA FILES

For the execution of COMFAR ECBA the following data files are needed:

- I. The corresponding data files from COMFAR ECBA commercial analysis, and
- II. The ECBA file.

The ECBA file is divided into three parts. Part one holding the rearranged data from commercial analysis, part two the preliminary adjustment factors and part three the foreign exchange rate conversion factors.

The structure of the source and the ECBA file is sketched overleaf.

COMFAR ECBA - DATA FILES

----- SOURCE - FILE -----  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

:  
:  
:  
:  
:

----- ADJUSTED - FILE -----  
  
SUTABLE WITH  
ARRANGEMENTS  
  
-----  
  
PRELIMINARY  
CONVERSION FACTORS  
  
-----  
  
FOREIGN EXCHANGE  
CONVERSION FACTORS



2.4. OPTIONS AVAILABLE FOR COMFAR ECBA

ADD

To add a certain amount to a specified table item or range of table items. ADD can only be used with ARRANGE. Especially used for imputing indirect effects.

ADJUST

Function key F4 in Main-Menu, to start data arrangement, preliminary adjustment or foreign exchange rate adjustment.

ARRANGE

To arrange source file to the needs of the economic impact analysis. ADJUST must be active to start with data arrangement. Data arrangement can be undertaken by using the SPLIT-, the MULT-, the DIVIDE-, or the ADD- function.

DISPLAY

When preliminary adjustment or foreign exchange rate adjustment is active, press F1 to switch between display of conversion factors and display of adjusted values.

DIVIDE

To divide a specified table item or range of table items by a given factor. DIVIDE can only be used with ARRANGE.

ExeSER

When using SPER (Shadow Foreign Exchange Rate) press ExeSER to execute Shadow Exchange Rate computations.

FILE

Press F2 in Main-Menu to select the file with adjustments for the economic impact analysis.

ForExch

To carry out individual adjustments for foreign currency flows by item and year. Select line "Shadow Foreign Exchange Rate", if the rate is constant for all items over a range of years (1..n).  
ADJUST must be active to start ForExch. For foreign exchange rate adjustment only MULT is valid, i.e. conversion factors can be defined.

HELP

Press F9 to open the on-line reference manual. The help facility is a reference manual that always opens at the right page. When the help key is pressed, the session is temporarily interrupted and information is displayed on the screen.

INFO

To add a text up to 79 letters at the bottom of a specified schedule.

MULT

To multiply a specified table item or range of table items by a given factor. Especially used for preliminary and foreign exchange rate adjustments.

PRELIM

To carry out price adjustments in order to reflect more accurately the real economic costs and benefits. ADJUST must be active to start with preliminary adjustment.

For preliminary adjustment only MULT is valid, i.e. conversion factors can be defined.

QUIT

Q(uit), RETURN or EXIT (F10) returns to the previous menu.

RANGE

You may change the (default) range within which an adjustment shall be made.

SAVE

Press function key F8 in Main-Menu to save file with adjustments.

->SFER \*

If one foreign exchange rate conversion factor is valid for all foreign flows within one year, choose table Shadow Foreign Exchange Rate (\*) and enter the conversion factor.

SHOW

Function key F3 in Main-Menu. To display or print all or selected schedules with or without indirect effects.

SOURCE

Press F1 in Main-Menu to select the source table from COMFAR financial analysis as starting point for the economic analysis.

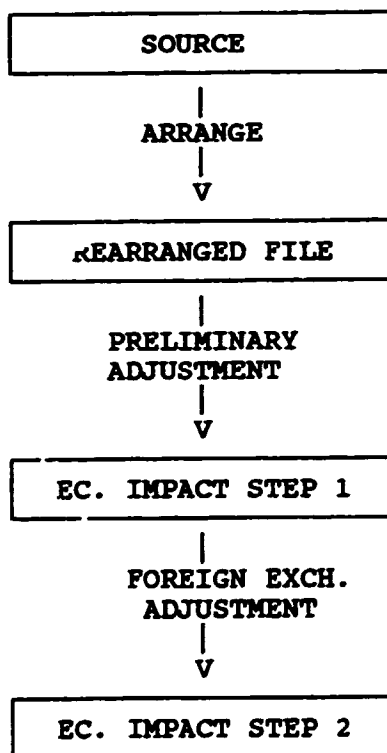
SPLIT

To split table items or a range within one line. Split can only be used with ARRANGE.

### 3. ARRANGING DATA FOR ECONOMIC ANALYSIS

#### 3.1. STRUCTURE OF COMFAR ECBA

The chart below sketches the structure of the COMFAR ECBA module. Starting from an already completed commercial analysis the figures are first rearranged to meet the needs of economic impact analysis. Afterwards conversion factors are defined. Finally adjustments of foreign currency flows are carried out.



### 3.2. STARTING "ADJUST"

The Source for COMFAR ECBA:

Prerequisite for the COMFAR ECBA is that you have already completed a financial evaluation with the COMFAR main system. The input and output tables from the financial analysis will serve as source for the economic impact analysis.

**CAUTION:**

You may start ADJUST only when you have completed COMFAR Input/Output tables (financial sources) or a previously adjusted file!

To choose the SOURCE table press F1 in Main-Menu, then enter the name of the file from COMFAR financial analysis and press RETURN. The default source will be the file worked with last in the COMFAR main system.

Proceed in the same manner to define your file with adjustments: press F2, enter the name of the file and press RETURN. You can choose the same name for your ECBA file as used in the source table. COMFAR ECBA automatically adds a suffix to the filename.

Starting ADJUST:

In order to start the ADJUST option press F3 ADJUST in Main-Menu. The following tables can be adjusted:

```
COMFAR - ECBA  
  
->Investment Costs, foreign  
Investment Costs, local  
Sales, foreign  
Sales, local  
Import Substitutions  
Production Costs, foreign  
Production Costs, local  
Indirect Effects, foreign  
Indirect Effects, local  
Finance, foreign Cashflow  
Finance, local Cashflow  
Shadow Foreign Exchange Rate
```

At the bottom of the menu the options available will be shown:

Your choice (↑↓, F-key) ??

1 2 3 4 5Arrange6Prelim 7ForExch8 Save 9 Help 0Exit

To adjust a subtable move the cursor (->) to the corresponding line and press:

```
█ F5 to arrange source table █  
█ F6 for preliminary adjustments █  
█ F7 for foreign exchange rate adjustment █
```

However, it stands to reason that foreign exchange rate adjustments can only be carried out for foreign tables. In sub-table Shadow Foreign Exchange Rate no arrangement and no preliminary adjustment can be undertaken.

### 3.3. REASONS FOR ARRANGEMENT

Financial and economic project evaluation pursue different objectives. While for the financial evaluation the net benefits from the enterprise's point of view, measured at market prices, are the final yardsticks, the objectives of economic evaluation are to determine the project's net benefit to the economy (country) as a whole. In economic evaluation not actual monetary flows come into consideration, but market prices are adjusted to their real economic values and indirect effects may be imputed.

Therefore the source table from the COMFAR main system has to be arranged before starting with the actual economic evaluation.

In the first step towards economic analysis data from financial analysis have to be rearranged mainly for the following reasons:

1. To arrange data in homogenous sub-groups, so price adjustments can be carried out properly. (e.g. skilled / unskilled labour, import substitution, foreign (local) components previously included in local (foreign) cash-flows)
2. To define those flows which shall be treated as transfer-payments in economic analysis. (e.g. taxes, subsidies)
3. To impute indirect effects. In case the project in question induces tangible or intangible costs or benefits outside the plant in question but within the economy. (e.g. environmental effects)



### 3.4. SPECIFYING A RANGE

Data adjustments can be done for a single table item, or any larger range of cells. In order to define a desired range for adjustments proceed as follows:

press F4 to activate the range option  
read the default value for the range

upper left corner

line,col RANGE [ 1, 1 ] <=> [ 12, 18 ]

lower right corner

To specify a new range you can choose either of the two methods:

#### I. Pointing method

move the cursor to the beginning of the  
range (Line, Column)  
press: F4  
move the cursor to the end of the range  
press: F4

## II. Typing method

```
type the number of the first line of the
range
press RETURN
type the number of the first column of the
range
press F4 or RETURN
type the number of the last line of the
range
press RETURN
type the number of the last column of the
range
press F4 or RETURN
```

However, when using SPLIT you cannot define a range which goes beyond one line. In case you do, no error message will be given but the range specified will automatically be reduced to one line and the split option will be carried out for this line only.

After the range has been specified, select a data entry option (ADD, MULT, DIVIDE, SPLIT)

### 3.5. ARRANGE OPTIONS

The following options can be used for ARRANGE:

ADD  
DIVIDE  
MULT  
SPLIT

SPLIT and ADD will probably be the options used most. SPLIT is mainly needed for rearranging the individual cost and benefit items, whereas ADD is essential for imputing indirect effects.

The SPLIT option:

In case you failed to distinguish between local and foreign items or between skilled and unskilled labour etc., you can make this up here.

Moreover, additional SPLITS which have not been offered in commercial analysis but which are essential for economic analysis can be carried out.

When using SPLIT, COMFAR ECBA offers you various possibilities to rearrange. The amount attached elsewhere must be given in percent of the total amount in the source.

An example of the split menu for investment cost local, land and site preparation is given below.

COMFAR - ECBA	
destination lines:	split rate in%
rest in source	100.00
land, site preparat., foreign	0.00
costs, monetary	0.00
indir. tax on input	0.00

For example if 20% of local investment cost are actually foreign and there are 10% tax on total investment, proceed as follows:

move the cursor to the corresponding line  
enter 20 in "investment foreign"  
press RETURN  
enter 10 in "indirect tax on input"  
press RETURN  
press F3 to execute arrangement

"rest in source" will automatically be set to 70, and the value in the cell will decrease by 30%.

Before starting SPLIT, consider thoroughly which splits will be required for the analysis and which not.

In practice it is essential to consider:

- foreign and local input and output  
(to apply the shadow foreign exchange rate properly, and to determine the National Value Added)
- flows, where there is actual use of resources involved and transfer payments  
(local transfer payments are omitted in economic analysis)
- skilled and unskilled labour  
(conversion factors for skilled and unskilled labour differ significantly)
- traded and non-traded input and output  
(shadow prices are in general not the same for traded and non-traded items)
  - import substitution and other
  - domestic input and output, competitive and non-competitive to other producers  
etc.
- tangible and intangible (merits, demerits) indirect effects  
(intangible indirect effects are omitted in Value Added)
- different kinds of transfer payments  
(this is important for the determination of the Distribution of the Value Added)

**CAUTION:**  
**SPLIT is only valid for a range within one line!**

You can, for example, split:

Investment Cost into:

rest in source in % of total  
investment, foreign or local, resp. in % of t.  
indirect input, costs in % of total  
indirect tax on input in % of total

**CAUTION:**  
**You have to rearrange the salvage value of  
foreign investment to local investment, unless  
it is actually transferred abroad!**

Material Cost into:

rest in source in % of total  
material foreign or local, resp. in % of total  
royalty  
indirect input in % of total  
indirect tax in % of total

Skilled Labour Cost into:

rest in source in % of total  
skilled labour forgn or local, resp. in % of t.  
unskilled labour in % of total  
indirect tax in % of total

etc.

**CAUTION:**

Do not enter the entire sales tax and the entire tax on production factors if sales tax is constructed as value added tax, i.e. taxes on production factors are deductible!

The ADD, DIVIDE and MULT - options work in a similar way as SPLIT:

specify a RANGE  
press ADD, DIVIDE or MULT  
enter the amount to be added or the  
division or multiplication factor  
press F3 to execute adjustment

To deduct a specific amount, also negative figures may be entered in ADD.

### 3.6. INDIRECT EFFECTS, EXTERNALITIES

Every project does affect in one way or another its environment. For some of these effects economy has not developed a mechanism to price them, these effects are referred to as INDIRECT EFFECTS, EXTERNALITIES, SOCIAL COSTS, EXTERNAL DISECONOMIES, REGRETTABLES, SOCIAL BENEFITS etc. [ 6].

Externalities occur whenever a part of the product of a plant is transferred by the investor to others for their benefit or damage without receiving anything in return [ 7].

As the impact of the project on the economy of the country is to be measured, these effects have to be taken into account, too, even though they do not influence the project itself.

In COMFAR ECBA local as well as foreign indirect effects can be defined. Yet, in most cases foreign indirect effects must be omitted as they do not contribute to the domestic economy.

Indirect effects might occur due to increased production of downstream or upstream industries, improved infrastructure, workers training, pollution etc.

They can be of monetary as well as of non-monetary nature. However, it is suggested, if indirect effects cannot be quantified except by arbitrary assumptions to rather mention them verbally than to consider them in the calculations.

In order to impute indirect effects in COMFAR ECBA, use the ARRANGE function. Choose table Indirect Effects and ADD the estimated amount. You can add tangible and intangible costs (demerits) and tangible and intangible benefits (merits).



#### 4. PRELIMINARY ADJUSTMENT

##### 4.1. REASONS FOR PRELIMINARY ADJUSTMENTS

In a perfect competitive market, prices are determined by supply and demand. The market mechanism sets every price according to its true value to society, i.e. its opportunity cost. But in practice there hardly exists any perfect market. [ 8].

Price distortions occur due to:  
restricted trade policies  
minimum wage legislation and union pressure  
subsidized interest rates  
restrictive foreign exchange regulations  
etc.

Commercial analysis evaluates the flows of input and output at market prices. In order to get a better idea of the contribution of the project to the whole economy, market prices are adjusted in economic analysis.

However, rather than elaborating on sophisticated mathematical models for price adjustments it is suggested to limit shadow pricing to:

- those items whose prices will be distorted most likely
- those items which influence the project's profitability most.

In practice this will be:

- Main output
- Importable material input
- Major non importable input
- Unskilled labour
- (foreign currency flows; will be dealt with in Subchapter 5.)

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

COMFAR ECBA does not assist in computing shadow prices, but they must be calculated outside the programme. For the methodology consult the corresponding literature [ 9].

When computing shadow prices remember the following rules:

TRADED GOODS if Project Input:

More Import.....c.i.f.  
(imported for project)

Less Export.....f.o.b.  
(would have been exported without project)

TRADED GOODS if Project Output:

More Export.....f.o.b.

Less Import.....c.i.f.  
(import substitution)

NON-TRADED GOODS if Project Input:  
(i.e. non tradable and tradable but not traded)

Competitive to other producers..... cost  
(full capacity in supply to consumer  
industries) (market price)

Not competitive to other.....value  
(free capacity in supply of production  
industries)

cont'd

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

NON-TRADED GOODS if Project Output:  
(i.e. non tradable and tradable but not traded)

Competitive to other producers.....cost  
(less by other local producers) of product.

Not competitive to other.....value  
producers (more to local to consumer  
users) (market price)

LAND.....opportunity cost

LABOUR

Unemployed without Project.....marginal value  
of production without  
project

Employed without Project.....market wage

#### 4.2. HOW TO CARRY OUT PRELIMINARY ADJUSTMENTS

**CAUTION:**  
All data arrangements must be carried out before starting with preliminary and foreign exchange rate adjustment!

In order to carry out preliminary adjustments, proceed as follows:

press ADJUST in Main-Menu  
choose table for preliminary adjustments  
press PRELIM  
specify a RANGE  
press MULT  
insert CONVERSION FACTOR  
press F3 to execute adjustment

It is:

Old value  
\* Conversion factor  
= Adjusted Value

You can switch between display of conversion factors and display of adjusted values by pressing F1, DISPLAY.

Average conversion factors per table item will be calculated and will be depicted in the Annual Adjustments Tables ADJ - 1, ADJ - 2, and ADJ - 3, respectively, (see Annex III of this volume).

(\*)

5. FOREIGN EXCHANGE RATE ADJUSTMENT

COMFAR ECBA offers two ways of adjusting foreign exchange rate. If one conversion factor is to be applied for all foreign currency flows within a specific range of years (default is whole period), the adjustment is undertaken as follows:

```
press ADJUST in Main-Menu
move cursor to table Shadow Foreign Exch. Rate
press ForExch (F7)
specify RANGE
press MULT
enter CONVERSION FACTOR
press F3 to execute adjustment
```

After having entered the conversion factors for all years

```
press ExeSER to execute Shadow exchange rates
```

For individual adjustments of foreign exchange rates the procedure is similar to the preliminary adjustment, but ForExch rather than PRELIM is chosen.

However, in case foreign cash flows are paid in local currency, they must not be adjusted to shadow exchange rates.

---

(\*) Foreign exchange rates [10] are very often determined by monetary policies rather than by supply and demand. There are hardly any freely floating currency markets, but all are restricted in one way or another. At a totally free currency market the exchange rate would be set at that point where supply is equal to demand. I.e. the balance of payments would be equalized.

## 6. COMPUTATION OF RESULTS AND REPORTING

### 6.1. REPORTING IN COMFAR ECBA

Contrary to the COMFAR main system, calculation of results and reporting do not have to be carried out separately in COMFAR ECBA, but are undertaken simultaneously.

After having defined a file with adjustments, start reporting with F3 in Main-Menu. Decide whether all or selected schedules shall be shown. Then the following chart will be displayed on your screen:

```
COMFAR - ECBA
-----
Display ECBA schedules          Prelim   ForExch
Press RETURN or F3 to accept job, or
                               to change select F6, F7, 1-9; F10

  f o r e i g n :
1  Present Values, accumulated [ no] [ no]
2  annual adjustments         [ no] [ no]
  l o c a l :
3  Present Values, accumulated [ no]
4  annual adjustments         [ no]
  t o t a l :
5  Present Values, accumulated [ no] [ no]
6  annual adjustments         [ no] [ no]

7  Absolute Efficiency Test   [ no] [ no]
8  Net Foreign Exchange Effect [ no]
9  Distribution of Domestic VA [ no]

Your choice (1-9, F-key) ??
```

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You can determine which adjustments shall be considered in the calculations. Press F6 or F7, respectively, and the number of the corresponding table in order to change [ no ] to [ yes ] and press F3, SHOW.

After entering whether indirect effects shall be imputed or not, COMFAR ECBA will ask you to determine the discount rate. 10% and 20% are the default values. However, only the second rate is used for NPV - computation in schedules 7, 8 and 9.

■ press F3 to accept these values ■

or:

■ press 1 or 2, respectively  
enter the desired discount rates  
press RETURN to accept the new rates  
press F3 to continue SHOW ■

In financial analysis mostly the borrowing rate at the capital market is taken as discount rate. However, one can find different opinions on how to define the social discount rate.

On one hand there are arguments, that, in accordance with the privat market, also the social discount rate depends on the capital market [13].

On the other hand it is argued, that the society has a longer time horizon than individuals and its propensity to save for the future is higher than in the privat sector. This would induce a social discount rate lower than the financial discount rate.

However, there is not a one and only true social discount rate. In COMFAR ECBA you can choose two different discount rates and rather than engage in academic discussions you can vary them in GRAFIX. (p.e.: Chart 5. Net Present Values at Different Discount Rates)

After choosing the starting year COMFAR ECBA will ask you if it should take the tables from memory. If not, insert the corresponding disk.

In the following brief explanations of selected schedules will be given. Examples will be presented in Annex III.

#### Total Cashflows at Adjusted Market Prices

The table shows the Present Values of the major cash-flow items at three different discount rates (0%, 10% and 20%). "Factor" represents the average conversion factor applied to the Present Values.

It is:

Present Value financial analysis \* factor =  
Present Value at adjusted prices.

#### Annual Adjustments

The individual adjustments per table item and year are depicted in the Annual Adjustment Tables. Contrary to the factor in the Cash-Flow schedules, this "Factor" has to be understood as adjustment factor [14].

It is:

Former value \* (1 + factor) = Adjusted Value,

and:

Former value \* factor = Adjustment

Both, the Total Cashflows- and the Annual Adjustments schedule can be displayed for local, foreign and total flows. It can be chosen which adjustments shall be carried out and whether indirect effects shall be imputed or not.



#### **Absolute Efficiency Test**

In the Absolute Efficiency Test [15] that portion of Value Added that exceeds wages is assessed. First the Domestic Value Added is calculated; (=Output - Material Input - Investment or Depreciation, respectively). After deducting repatriate payments the Net National Value Added is divided into wages and social surplus. If social surplus is positive, the project passes the Absolute Efficiency Test.

The Relative Efficiency Test [16] measures the Value Added per unit of capital invested, foreign exchange and skilled labour, respectively.

#### **Foreign Exchange Effect**

In this table [17] the net foreign exchange flow is assessed at first. The net foreign exchange flow represents the effect on the country's balance of payments, induced by the project. Not only direct but also linkage effects should be considered. Then the savings due to import substitutions are added in order to arrive at the Net Foreign Exchange Effect. [18] If the Net Foreign Exchange Effect is positive the project will contribute to the availability of foreign exchange in the country.

#### **Distribution of Net Domestic Value Added**

In this table it is measured how the Net Domestic Value Added is distributed among the individual local and foreign social groups; (workers, government, financing institutions and share-holders, and rest that will remain within the plant) [19].

## 6.2. COMFAR ECBA AND COMFAR GRAFIX

The results of COMFAR ECBA can also be illustrated graphically with the COMFAR GRAFIX module. For the execution of GRAFIX consult the COMFAR User's Guide and Reference Manual, Chapter IV, 7.

The following charts are especially designed for the illustration of the economic impact analysis:

1. NCF/year, adjusted market prices
2. NCF/year, adjusted exchange rate
3. Accumulated CF, adjusted market prices
4. Accumulated CF, adjusted exchange rate
5. Net Present Value, financial analysis
6. Net Present Value, adjusted market prices
7. Net Present Value, adjusted exchange rate
8. Structure of Value Added.

For the interpretation of charts 1. through 4. consult the COMFAR User's Guide Chapter IV, 7. Charts 5. through 8. will be discussed on the following pages.

### 6.2.1. NET PRESENT VALUE, FINANCIAL ANALYSIS

**Meaning:**

The Net Present Value [12] represents the sum of the annual net cash flows of the entire lifetime of the project discounted at a given rate.

Obviously the Net Present Value decreases with increasing discount rates.

The discount rate at which the Net Present Value becomes zero corresponds to the Internal Rate of Return or Economic Rate of Return, respectively.

**Computation:**

For each year the annual net cash flow is discounted to the start of the project, the sum of the discounted annual net cash flows represents the Net Present Value:

$$NPV = \sum_{y=0}^n \frac{CF_y}{(1+i)^y}$$

NPV: net present value  
y: year (for y = 0..n)  
i: discount rate  
cf: net cash flow

**Interpretation:**

Chart 5. demonstrates the Net Present Values at different discount rates for the financial analysis, the economic analysis step 1 (after preliminary adjustment) and the economic analysis step 2 (after foreign exchange rate adjustment).

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The Rate of Return is where the Net Present Value curve passes the zero-line, i.e. for the example case:

- 19% for financial analysis, at market prices
- 51% for economic analysis - step 1, at preliminary adjusted prices
- 54% for economic analysis - step 2, at economic prices i.e. after preliminary adjustment and foreign exchange rate adjustment.

As can be seen, the project's earning rate in the commercial point of view is far lower than the earning rate in the economic point of view. Whereas the economic rate of return after step 2 is still higher than the economic rate of return step 2. This is due to the positive net foreign exchange effect.

Chart 6. and 7. show the adjusted Net Present Values (step 1 and step 2) and allow to plot sensitivity for varying investment outlays, operating costs or sales prices.

### 6.2.2. STRUCTURE OF VALUE ADDED

#### Meaning:

Gross Domestic Value Added [13] measures the real monetary contribution of the project to the economy of the country. Not only the directly but also indirectly generated value added (by means of linkage effects) is thereby considered.

#### Computation:

Gross Domestic Value Added is defined as:

$$\begin{aligned} & \text{TOTAL REVENUES} \\ & \text{minus MATERIAL INPUT (=intermediates)} \end{aligned}$$

which corresponds to the SUM:  
DEPRECIATION  
plus WAGES  
plus SOCIAL SURPLUS

Gross Domestic Value Added minus Depreciation is referred to as Net Domestic Value Added.

However, for national economic welfare not the domestic but national net benefits are relevant, therefore repatriate payments have to be deducted in order to arrive at the project's contribution to the national welfare.

**Interpretation:**

The chart shows the Value Added share of the annual project output as well as the structure of the Gross Domestic Value Added, Net Domestic Value Added and Net National Value Added, i.e. the depreciation, repatriate payments, wages and salaries, interest and profit, governmental earnings and undistributed profits.

In this specific case the Gross Domestic Value Added amounts to 7.7 million US\$, which corresponds to approximately 52% of total output, the Net Domestic Value Added reaches 42%. After the deduction of repatriate payments (10% of Gross Domestic Value Added), the Net National Added is distributed as follows (in percent of Gross Domestic Value Added):

20% wages and salaries  
2% interest and profit  
37% governmental earning (taxes)  
20% undistributed profit.

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## 7. CASE STUDY

This case study is based on the amended UNIDO case as described in the UNIDO Manual for the Preparation of Industrial Feasibility Studies. COMFAR Users might already be familiar with it, as the same example has been introduced in the COMFAR User's Guide and Reference Manual, Chapter V.

Note: Even though some assumptions do not have a significant impact on the economic feasibility, they have been introduced for didactical purposes only.

### 7.1. ASSUMPTIONS

1. TAXES: (average values per item)
  - 5% on land
  - 10% on rest of local investment
    - materials and inputs: assumed at border prices
  - 20% value added tax on sales
    - income tax for unskilled labour: no tax assumed
    - 20% income tax for skilled labour
2. 50% foreign part in local equipment.
3. 50% of local sales are import substitutions,  
rest is not competitive to other producers.



4. 40% of factory personnel and 20% of administrative personnel are unskilled.

5. **INDIRECT EFFECTS:**

The project induces indirect costs due to water pollution, whereof 50% are actually monetary costs and 50% are intangible. The total indirect costs are estimated at:

500 US\$ for the first year of production  
700 US\$ for the second year of production  
1000 US\$ for all other years of production.

Moreover, accelerated growing of the upstream industries will be caused by the project. They are estimated at 50% of the annual sales revenues.

6. **SHADOW PRICES:**

- a. Unskilled labour would be partly unemployed in the without project case, therefore a CONVERSION FACTOR of 0.8 is assumed.
- b. The opportunity cost of land is 60% of the price calculated with in financial analysis.
- c. The Shadow Foreign Exchange Rate is 1.3 times higher than the official exchange rate.
- d. For local supply the market price is below the border price. For the case of import substitutions the c.i.f. price of the imported product is 5% above the domestic market price.

7.2. INDIVIDUAL STEPS OF THE CALCULATION

1. START ECBA
2. DEFINE SOURCE
3. DEFINE FILE WITH ADJUSTMENTS
4. PRESS ADJUST AND START WITH ARRANGE

Note: Before carrying out the individual steps of adjustment, you have to specify a range as described in Subchapter 3.4.

5. REARRANGE SALVAGE VALUE OF FOREIGN INVESTMENT TO LOCAL INVESTMENT  
(Table: Investment Costs, foreign)

Reason: The salvage value of foreign investment will not be transferred abroad, therefore it must not be defined as foreign currency inflow.

Procedure: Choose the SPLIT option and enter 100 in "investment, local". Then press RETURN and ADJUST.

6. REARRANGE TAX ON INVESTMENT  
(Table: Investment Costs, local)

Reason: Indirect taxes on investment are costs for the investor, but not for the economy of the country. They are transfers from the investor to the government.

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Procedure: Choose the SPLIT option and enter 5 or 10, resp. in "indirect tax on input". Then press RETURN and ADJUST.

7. REARRANGE FOREIGN PART IN LOCAL EQUIPMENT  
(Table: Investment Costs, local)

Reason: For economic analysis it is essential to distinguish precisely between local and foreign input and output. The contribution of the project to the Domestic Value Added is to be assessed.

Procedure: Choose the SPLIT option and enter 50 in "equipment, foreign". Then press RETURN and ADJUST.

8. ADD SALES TAX  
(Table: Sales, local)

Reason: From the economic point of view sales tax is inflow  
Procedure: Choose ADD, type 1.274, 1.874, 2 and 2.5, resp. in the corresponding cells. Then press ADJUST.

9. REARRANGE IMPORT SUBSTITUTIONS  
(Table: Sales, local)

Reason: Import substitutions actually affect foreign flows as they avoid imports. To define them separately is essential for the assessment of the Net Foreign Exchange Effect.

Procedure: Choose the SPLIT option and enter 50 in "import substitution". Then press RETURN and ADJUST.

10. REARRANGE LABOUR

(Table: Production Costs, local; Line: skilled labour,  
administr. personnel)

Reason: Different shadow rates are applied for skilled and unskilled labour.

Procedure: Choose the SPLIT option and enter 40 or 20, respectively in "unskilled labour". Then press RETURN and ADJUST.

11. REARRANGE LABOUR TAX

(Table: Production Costs, local; Line: skilled labour,  
administr. personnel)

Reason: It is essential for the assessment of the Distribution of Value Added whether Value Added goes to wage earners or to government.

Procedure: Choose the SPLIT option and enter 20 in "indirect tax". Then press RETURN and ADJUST.

12. IMPUTE INDIRECT EFFECTS

(Table: Indirect Effects, local)

Reason: Indirect effects are costs/benefits to the economy.

Procedure: Choose ADD and enter .25, .35, and .5, resp. in "costs, monetary", enter the same figures in "demerits, costs". Then press ADJUST.

Proceed in the same manner to impute the tangible benefits.

13. START PRELIMINARY ADJUSTMENT

14. CARRY OUT PRICE ADJUSTMENT FOR LAND, UNSKILLED LABOUR AND IMPORT SUBSTITUTION

(Table: Investment Costs, local  
Production Costs, local  
Import Substitutions)

Reason: In economic analysis factors have to be valued at their opportunity costs. The prices of many factors are very often determined by policies rather than by demand and supply.

Procedure: Use MULT and enter the factor 0.6, 0.8 and 1.05, respectively. Then press ADJUST.

15. CARRY OUT FOREIGN EXCHANGE RATE ADJUSTMENT

(Table: Shadow Foreign Exchange Rate)

Reason: The official exchange rate does not reflect the true economic cost of foreign exchange.

Procedure: Use MULT and enter the factor 1.3 and 1.1, resp. Then press ExeSer.

16. PRINT SCHEDULES

17. SAVE TABLES

18. PROCEED WITH GRAFIX

ANNEX I: LIST OF CROSS REFERENCES

- Ref. No. 1:  
Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 86
- Ref. No. 2:  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 61;
- Ref. No. 3:  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 95;
- Ref. No. 4:  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 89;
- Ref. No. 5:  
Comfar User's Guide and Reference Manual, Chapter II, p. 27;
- Ref. No. 6:  
Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 35;  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 81;
- Ref. No. 7:  
Pigou, A.C., The Economics of Welfare, 3rd Ed., London 1929, p.176.

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Ref. No. 8:

Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 22-26 (traded and non-traded goods), p. 36-40 (labour);  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 56;

Ref. No. 9:

Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 24;  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 56;

Ref. No. 10:

Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 46;  
Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 114;

Ref. No. 11:

Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 14, p. 44 and p. 79;

Ref. No. 12:

Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 59;

Ref. No. 13:

Manual for Evaluation of Industrial Projects, UNIDO, Vienna 1986; p. 111;

Ref. No. 14:

Guide to Practical Project Appraisal, Social Benefit-Cost Analysis in Developing Countries, UNIDO, Vienna 1986; p. 32;

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- Ref. No. 15:  
Manual for Evaluation of Industrial Projects, UNIDO,  
Vienna 1986; p. 61;
- Ref. No. 16:  
Manual for Evaluation of Industrial Projects, UNIDO,  
Vienna 1986; p. 68;
- Ref. No. 17:  
Manual for Evaluation of Industrial Projects, UNIDO,  
Vienna 1986; p. 97;
- Ref. No. 18:  
Manual for Evaluation of Industrial Projects, UNIDO,  
Vienna 1986; p. 95;
- Ref. No. 19:  
Manual for Evaluation of Industrial Projects, UNIDO,  
Vienna 1986; p. 89;
- Ref. No. 20:  
Guide to Practical Project Appraisal, Social Benefit-  
Cost Analysis in Developing Countries, UNIDO, Vienna  
1986; p. 99;



ANNEX II: GLOSSARY

[20]

**a d j u s t m e n t   f a c t o r :**

The percentage by which the financial price of an input or output must be raised or lowered to reflect its economic value.

**a d j u s t m e n t   v a l u e :**

The amount by which the market price has to be adjusted in order to reflect more accurately the economic value.

**b e n e f i t :**

Monetary or non-monetary output of a project.

**b e n e f i t   c o s t   a n a l y s i s :**

A procedure of evaluating a project by weighing benefits against costs. Also: Cost-Benefit Analysis.

**b o r d e r   p r i c e :**

A price of a tradable good at a country's border or port of entry. I.e. f.o.b. for exports and c.i.f. for imports.

**c o m m e r c i a l :**

From the point of view of the investor.

**c o n v e r s i o n   f a c t o r :**

The ratio of the market price of an input or output to its shadow price.

**c . i . f . :**

Cost, Insurance, Freight or Charged in Full, border price of an import good that includes purchase cost abroad and charges the international freight and insurance necessary to bring it to the port of entry and to unload it on the dock alongside ship.

**c o n s u m e r w i l l i n g n e s s t o p a y:**

What consumers are willing to pay for a certain good or service.

**d e m a n d:**

Need or desire for a good or service. Usually expressed as quantity of a good or service which an individual or group desires at ruling price.

**d e m e r i t:**

Indirect, indtangible cost. Negative impact of a project which is not reflected in its financial accounts and which cannot be assessed in actual monetary terms.

**d e p r e c i a t i o n:**

The allocation of the cost of an asset over time. Usually refers to the reduction in the value of assets generally from wear and tear. The consumption of capital is recognized as a cost of production and allowance for this is made before net profit is arrived at.

**d i s c o u n t r a t e:**

The interest rate at which future values are discounted to the present.

**d i s c o u n t e d c a s h f l o w:**

A type of analysis where the time preference of money is implicitly considered by discounting the cash flows to the present.

**d i s t o r t i o n:**

In an imperfect competitive market, when market prices do not reflect the opportunity costs.

**d o m e s t i c v a l u e a d d e d:**

Output cost in domestic prices minus cost of material input in domestic prices.

**e c o n o m i c r a t e o f r e t u r n:**

Internal Rate of Return based on economic prices.

**e x c h a n g e   r a t e :**

Units of domestic currency by unit of foreign currency.

**f i n a n c i a l :**

Having to do with market prices.

**f . o . b . :**

Free on Bord; the price of an export good loaded and ready for departure.

**f o r e i g n   e x c h a n g e :**

Any non-domestic currency.

**i n p u t :**

That which is consumed by the project.

**i n d i r e c t   e f f e c t :**

Impact of a project, not reflected in its financial accounts.

**i n t a n g i b l e :**

A cost or benefit that cannot directly be assessed in actual money terms.

**i n t e r n a l   r a t e   o f   r e t u r n**

Yield of profitability of a project based on discounted cash flow technique. The Internal Rate of Return corresponds to the discount rate at which the Net Present Value becomes zero.

**m a r k e t   p r i c e :**

a) Price of a good in the domestic market,  
b) the cost of a good including indirect taxes and subsidies, (distinguished from factor cost).

**m e r i t :**

Indirect, intangible benefit. Positive impact of a project which is not reflected in its financial accounts and which cannot be assessed in actual monetary terms.

**m o n e t a r y:**

In terms of money. See also tangible.

**n e t p r e s e n t v a l u e:**

The difference between the discounted flows of benefits minus the discounted flows of costs.

**n o n - m o n e t a r y:**

Not in terms of money; cannot be assessed in monetary terms. See also intangible.

**n o n t r a d e d:**

A good which is not traded internationally. Either a nontradable good or a tradable good that is for economic or policy reasons not traded.

**o u t p u t:**

That which is produced by the project.

**p r e s e n t v a l u e:**

The result of discounting a future value to the present at a given discount rate.

**r e p a t r i a t e p a y m e n t:**

Value Added of a project which is transferred abroad e.g. by means of wages etc.

**s h a d o w e x c h a n g e r a t e:**

An exchange rate that reflects the economic value of an additional unit of foreign exchange.

**s h a d o w p r i c e:**

Strictly every price which is not the market price. But mostly referred to as the price which reflects the true economic value of a good or service.

**s u p p l y:**

Willingness to provide.

**s u r p l u s:**

Something extra.

**t a n g i b l e :**

A cost or benefit which actually represents a monetary cash-flow. Distinguished from intangible.

**t r a d e d :**

A good that is traded internationally.

**t r a n s f e r p a y m e n t :**

A payment which does not involve any use of resource; i.e. without receiving anything in return.

**v a l u e a d d e d :**

The value that has been added by the labour and capital employed by the producer.

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**ANNEX III: SCHEDULES**

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**Total Cashflows at Adjusted Market Prices** in million us dollar  
 Economic Analysis including (excluding) indirect effects

	financial present values			factor %	adjusted present values		
	at 0%	at 10%	at 20%		at 0%	at 10%	20%
<b>cashflow:</b>							
net cashflow.....							
<hr/>							
<b>net indirect effects</b>							
total cash inflow.....							
total cash outflow.....							
taxes							
<b>flow of funds:</b>							
net flow of funds.....							
<hr/>							
<b>total funds, inflow.....</b>							
equity.....							
subsidies, grants....							
loans and overdraft..							
<b>total funds, outflow....</b>							
interest.....							
repayment.....							
dividends distributed							
<b>net flow, foreign funds</b>							
<hr/>							
<b>foreign funds, inflow...</b>							
equity.....							
subsidies, grants....							
loans & overdraft							
<b>foreign funds, outflow..</b>							
dividends distributed							
debt service							
interest paid							
loan repayment							

cont'd

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financial rate of return (market prices) .....X  
economic rate of return (prelim.adjust)  
economic rate of return (econom.prices)

---

text up to 79 characters



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ADJ - 1.1 Annual Adjustments in million us dollar  
 Adjustments of market prices including (excluding) indirect effects

	accumulated adjustments		factor	annual adjustments		
	at 0%	at 10%	%	1967	1968	1968
cashflow:						
net cashflow, operation:						
<hr/>						
sales revenue, incl. tax						
other income.....						
indirect effects,benefit						
cash outflow, operation:						
fixed investment.....						
net working capital.....						
operating costs.....						
materials.....						
unskilled labour.....						
supervision & skilled						
taxes						
indirect effects, costs.						
<hr/>						

text up to 79 characters

COMPAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

**Absolute Efficiency Test -1** in million us dollar

Economic Analysis at market prices including (excluding) indirect effects

	grand total	total constr.	total produc.	construction		production		
				1987	1988	1989	1990	1991
value of output, O								
material input, MI+I								
investment, I								
operation, MI								
<hr/>								
net domestic VA								
repatriated payments								
net national VA								
national wages								
social surplus								
present values at		20.00%						
PV, net national VA								
PV, national wages								
PV, unskilled labour								
PV of social surplus								
<hr/>								
relative efficiency of: capital invested, E(C) :								
foreign exchange, E(FE) :								
skilled labour, E(L) :								
financial rate of return (market prices)				.....%				
economic rate of return (prelim.adjust)								
economic rate of return (econom.prices)								

text up to 79 characters

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

Foreign Exchange Effect in million us dollar

Economic Analysis including (excluding) indirect effects

100 units foreign CU = 100.00 units local CU

	construction		production				
grand total	total constr.	total produc.	1987	1988	1989	1990	1991
total foreign inflow.							
equity capital.....							
subsidies, grants....							
loans & overdraft....							
exports.....							
indirect effects.....							
total foreign outflow							
royalties.....							
equipment.....							
imported materials...							
repaym. loan & overd.							
other repayments.....							
repatriated wages....							
dividends paid.....							
interests.....							
indirect costs.....							
net foreign exch flow							
import substit effect							
net forgn exch effect							
present values at							
foreign exchange flow							
net forgn exch effect							

text up to 79 characters

COMFAR 2.1 - User's Guide and Reference Manual, Chapter VI, ECBA

Distribution of Net Domestic Value Added in million us dollar  
 Net Income Flow Analysis (excluding) indirect effects

	grand total	total	constr.	total produc.	construction		production			
					1987	1988	1989	1990	1991	
gross domestic VA..										
annual depreciation										
net domestic VA....										
repatriate payments										
wages.....										
interest, f.loan										
dividends, repatr										
other payments..										
net national VA....										
wage earners VA w										
profit, interest VA p										
government VA g										
undistributed VA u										

---

distribution indices  
 (VA w)/VA.....  
 (VA p)/VA.....  
 (VA g)/VA.....  
 (VA u)/VA.....

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text up to 79 characters