PERFORMANCE ASSESSMENT OF RESPONSABILITY CENTERS BASED ON INTERNAL TRANSFER COSTS

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Internal transfer costs (ITC) are the costs, which assess the internal performance available between the "seller" responsibility centres and the "buyer" responsibility centres of a company. A profit centre can receive some deliveries from the centres of the same company. Furthermore, it can sell (transfer) part of its production to other centres of the company. At centres level profit (or cost) shall be determined following the assessment of the internal performances based on the internal transfer costs.Internal transfer costs do not change the overall result of the company. The term of transfer costs is used when internal transfers occur between two different juridical entities, and assessment of goods and service transfer results in fiscal effects (e.g. transfer of secret benefits from a country to another or results distribution per branches). This paper will not approach the fiscal issues of transfer costs. Upon choosing of internal transfer costs, a wide range of factors should be considered, as follows: nature of responsibility centres, supply sources, company's strategy.

Key words: internal transfer costs, John Dearden pattern, Robert Eccles pattern ,optimum program

Roles of internal transfer costs in performance of management control

Internal transfer costs shall follow three main objectives, such as: optimization of the economical decision, motivation of personnel and control of responsibility centres.Transfers costs are basic tools while making decisions in order to provide optimum resources and maximize the company's profit. They should encourage the responsible of profit centres to have productivity profit, which will result in growth of the company's competitiveness.

Transfer costs encourage the convergence of the company's objectives and members. They should not direct the responsible of the profit centres to improve their own results in the disadvantage of the company's overall earning profit.

Transfer costs shall allow to evaluate fairly and realistically the long-term activity of the responsible of the profit centres. Centres activities (client or supplier) should not impact other centre's results. A 90s study undertaken in the French companies shows the transfer costs are widely used in making decisions in order to: maximize the profit; obtain a higher market share; maintain a supply source; control the services; evaluate the responsible performances; improve the productivity; co-interest the centres in their own results; place the margins on reasonable criteria. The study's results indicate the optimization of the economic decisions to the detriment of the evaluation of the centre performances.

However, internal transfer costs cannot solve all management issues of a complex company and its scopes can often be contradictory. Performance evaluation and responsible motivation can seldom be incompatible. The scopes opposition is not particular only to the internal transfer costs, but to the general management control. ***How could we evaluate the actors not to determine them to develop deviated behaviour?*** Transfer costs system may become a dynamic and motivating factor to the personnel and may turn into an excellent management tool, as well. Responsible of a profit centre, in charge to increase the centre margin, might be still needed to make decisions which would impact the neighbouring centres.

Factors affecting the selection and determination of internal transfer costs (ITC)

Upon selection of internal transfer costs, various factors should be considered such as: nature of responsibility centres; supply sources; company's strategy.

The first factor, *nature of responsibility centres,* supposes selection of ITC based on each centre scopes. Actual cost or recalculated (reconsidered) market cost can be applied to deduct the services provided between profit centres. Internal transfer costs based on costs are preferred for the services provided between the cost centres or between the cost centres and profit centres. The table below highlights the relation between the nature of responsibility centres and parameters of applied internal transfer costs.

Table 1: Selection of transfer costs based on the centres nature

Nature of responsibility centres	**Characteristics**	**Transfer cost ITP**
Pure profit centre	Scopes: in profit terms Request: internal and external	Real market cost Reconsidered market cost
Impure profit centre	Scopes: in profit terms Request: internal	- complete cost + margin (real or standard) - marginal cost + margin
Cost centre	Scopes: in cost, quality, and deadline terms. Offer: internal and/ or external	- complete cost (real or standard) - marginal cost

The second influence factor is the supply sources or John Dearden pattern. In an *Harvard Business Review* article published in 1960, John Dearden determined a relation between the type of manufactured product and selection of supply sources.

Table 2: John Dearden pattern

Products type	***Characteristics of supply sources***	***Applied ITC***
Class A	***Solely internal supply***	***- complete cost + margin***
Class B	***Mix supply***	***- complete cost + margin*** ***- market cost***
Class C	***External supply***	***- market cost***

Therefore, in respect to the A class products (products, which can never be produced by an external supplier), the author proposes a transfer cost established based on the cost plus a margin. Why external suppliers cannot produce A class products? Because: either the company does not wish to due to manufacturing secrete reasons (this secrete is the key success factor), or the company does not find a supply source able to comply with its supply restrictions (deadlines, quality, quantity, etc).

B class products are the products for which the decision on change of supply source could be implemented only at a subsequent stage, on long-term. Such decision is grounded on the investments, which the company would like to make profitable. In this case, more solutions shall be taken into account to determine the internal transfer costs. We will use either the market cost on long term (calculated based in the current costs practice outside the company or costs paid to the external suppliers), or the cost increased by the benefit margin.

C class products are the products for which the supply sources can be expeditiously changed. They do not need specialized equipment and there is almost a pure and perfect market for such kind of products. The recommended transfer cost is the current market cost. *Supply* intern centre *is being present on the external market and is running large and significant contracts and orders.*

The last evaluated factor is the company's strategy, founded on Modelul Robert Eccle pattern. In his paper, *Internal transfer costs, published in 1985,* Robert Eccles establishes a connection between two strategic sides: vertical diversification and integration and organisation parameters of the company represented by: strategy nature and planning process; main control means of the general direction; performance assessment criteria and their effect on reward-sanction. These criteria haven used to devise the

following pattern regarding determination of the internal transfer costs. We have identified four types of organisations to which we could have assigned a pattern for determination of internal transfer cost:

1. Collective type is not fitted to internal transfer if:

- Vertical integration is poor (technical or commercial interdependence between responsibility centres is at a very law level)
- Diversification level is poor (e.g mono-product companies).

2. Competition type is proper to the much diversified, but poorly vertical integrated companies, (e.g conglomerate or holdings). Their strategy is defined by each responsibility centre. The group is based on a financial logic, where the general direction control depends on the scope results control. Decisions are made in a decentralized manner and supply is free. The adopted transfer cost is defined by reference to the market cost.

3. Cooperation type is proper to the strongly integrated but poorly diversified companies (e.g ferrous metallurgy or agro-alimentary companies). Their strategy is conceived for a group as a whole. The group is based on an industrial logic type where internal supplies prevail in order to make a profit of large investment. General direction control is much organised as a hierarchy and defines the actions of the company or of responsibility centres. The performance will be measured by comparison of the results or budgets. The decisions that might affect the group results will be centralized. Transfer cost determination will depend on the costs (preferably on the standard complete cost increased by a ratio calculated based on the investments profitability rate). Actually, the transfer cost strengthens the cooperation between the client centres and supplier centres. Client centres will jointly agree the investment decisions made by the supplier centres.

4. Participative type is proper to the much vertical integrated and diversified companies. They combine the features of the competition type organisation and the features of the cooperative companies. Inasmuch the transfer, priority lays on the internal supply (characteristic to integration) but the transfer cost is based on the market cost.

Optimization of overall performances by predicted transfer costs

General Direction could require an internal transfer cost able to optimize the company's results, taking into account the production constrains predictable at each responsibility centre level. On the other hand this optimal transfer cost should negotiate (conciliate) the profit scopes of the seller centre and buyer centre. Internal transfer cost will be defined according to the following relation: Internal transfer cost = margin cost of seller centre + margin result. Linear planning will provide assistance to determine the optimal quantities and the marginal result appropriate to a unit variation per manufactured product.

Example:

A profit centre called "A" manufactures two intermediate products: Pi1 and Pi2. They are yielded (transferred) to B profit centre that uses them to produce finite products X1 and X2. Part of P2 production can be sold to the third parties, outside the company. The scope of the General Direction is to maximize the margin of the variable costs. Considering the production constrains, General Direction should determine the quantities to be produced, the appropriate transfer costs which allow compliance with the respective scope.

Data:

Centre A	**Product Pi 1**	**Product Pi 2**
Variable unit cost	***€ 30***	€ 40
Unit market cost	Not applicable	€ 60
Production output (maximum)	9.000 pcs	10.000 pcs

Centre B	Product X1	Product X2
Market cost	€ 400	€ 380
Technical standards per product piece	1 product P1 4 products P2	3 products P1 2 products P2
Other variable unit costs	60 €	10 €

Looking for company's overall optimum rate

Calculation of unit margin per variable costs related to the products sold outside.

Explanations	P2	X1	X2
Selling cost (€/pcs.)	60	400	380
Variable cost P1		-30	-90
Variable cost P2	-40	-160	-80
Other variable costs		-60	-10
Margin per variable costs	**20**	**150**	**200**

We will mark by p_2, x_1, x_2 the quantities of P2, X1 and X2 products sold outside. Variables e_1 and e_2 are the quantities of intermediate products P1 and P2 which production would be given up if the production output could not meet the needs. Linear planning will be used to solve out this issue. The program which maximizes the margin per variable costs reads the formula below:

$p_2, x_1, x_2 \geq 0$

$x1 + 3x2 \leq 9.000$

$p2 + 4x1 + 2x2 \leq 10.000$

$\max Z = 20\,p2 + 150\,x1 + 200\,x2$

Standard type supposes to enter the variable e_1 and e_2 into the pattern:

$p_2, x_1, x_2, e_1, e_2 \geq 0$

$x1 + 3x2 + e1 = 9.000$

$p2 + 4x1 + 2x2 + e2 = 10.000$

$\text{Max } Z = 20p2 + 150x1 + 200x2 + 0e_1 + 0e_2$

- *Simplex patter* will be sued to solve out the issue*:*

Optimal program requires to produce 1.200 pieces X1 and 2.600 pcs X2 and P2 should not be sold outside the company. Transfer of A centre to B centre to allow production of x1 and x2 will raise to:

- Products P1 (1.200 + 3x2600) ……..9.000 pcs.
- Products P2 (4x1.200 + 2x2.600)……10.000 pcs.

ΔZ coefficients indicate the unit margins which could be reached should another solution be chosen:

-outside sold of one P2 would mean to lose € 5.

-giving up of one P1 or P2 production would mean to lose € 50 or € 25. The last amounts are the margin results per one P1 and P2 which should be added to the variable costs to obtain the internal transfer costs for the two products. Determination of internal transfer costs is revealed in the table below.

Explanations	**P1**	**P2**
Variable costs (Euro/pcs.)	30	40
Marginal resul per company (Euro/pcs.)	50	25
Internal transfer cost (Euro/pcs.)	***80***	***65***

Looking for local optimum rate

We will check whether based on this transfer costs, the production program is also optimum for A seller centre. Calculation of a unit margin per variable costs of products yielded by A centre

Explanations	**P1**	**P2 yielded to B centre**	**P2 sold**
Transfer cost (Euro/pcs)	80	65	60
Variable cost (Euro/pcs.)	-30	-40	-40
Margin per variable costs at A centre (Euro/pcs.)	50	25	20

Linear planning. We will mark by p1 – the quantity in P1 yielded to B, by p2 – the quantity P2 yielded to B, by p3 – quantity in P2 yielded outside the company. Ecart variables e1 and e2 are the quantities of intermediate products P1 and P2 which production would be given up.

Program regarding maximization of margin per variable costs at A centre is:

- Canonic type

$p1,p2,p3 \geq 0$

$p1 \leq 9000$

$p2 + p3 \leq 10.000$

$Max\ Z = 50p1 + 25p2 + 20p3$

- Standard type

$p1,p2,p3,e1,e2 \geq 0$

$p1 + e1 = 9.000$

$p2 + p3 + e2 = 10.000$

$Max\ Z = 50p1 + 25p2 + 20p3 + 0e1 + 0e2$

Optimum program for "A" centre requires production of 9.000 pcs P1 and 10.000 pcs P2 (which will be yielded in full to B centre). This is the same with the optimal program determined before. ΔZ coefficients show the unit margins which would be lost should another solution be selected: selling of one p2 outside the company would mean to lose € 5; giving up to yield one unit of the semi-fabrication units made by A centre would mean to lose € 50 for P1 or € 25 for P2 .

Disadvantages of planned transfer costs lay on their determination manner, which is the linear planning method is not agreed by the public. If the market restrains (e.g the amount of products sale to the clients, supply deadlines) are not met, then the seller centre could not cover their fix expenses, which would entail significant variations of results. Although by applying Solver function in Tool menu, Excell, appropriate results could be obtained in a satisfactory time period.

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