

COST CONTROL - ZERO BASE BUDGETING AND COST DRIVERS

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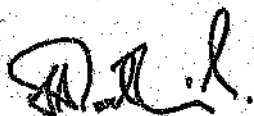
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A research report submitted to the Faculty of
Commerce of the University of the Witwatersrand in
part completion of the degree of Master of
Commerce, by coursework.

DECLARATION

I declare that this research report is my own, unaided work. It is being submitted for the degree of Master of Commerce in the University of the Witwatersrand, Johannesburg. It has not been submitted for any degree or examination in any other University.



John Alistair Stewart Borthwick

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ABSTRACT

The purpose of this report is to examine zero base budgeting (ZBB) and cost driver analysis, or activity based costing (ABC), as two techniques in cost control.

The survey of relevant literature shows ZBB as a superior method, over normal budgeting, to reduce discretionary expenditure and to assist in a better allocation of funds if there are constraints on overall expenditure. ABC is demonstrated as a superior cost allocation method over marginal and absorption costing methods, and as a strategic tool in assisting company managements to enhance profitability. ZBB is found to focus on the cost reduction of discretionary expenditure with little attention to the overall strategy of a company whereas ABC is found to be an improved strategic tool to enhance company profitability with less emphasis on cost reduction.

Two case studies examine the application of ZBB and ABC and both confirm the findings of the survey of literature. However the case studies showed that the usefulness of ZBB and ABC vary according to the specific circumstances of a company. Where the management of costs are efficient the value of ZBB diminishes and where wastage is excessive the value of ZBB increases. Where cost structures are simplistic ABC provides little benefit over traditional costing systems. But where cost structures are complex ABC is superior compared to simpler costing systems, such as absorption or marginal costing, in providing information to assist in enhancing financial performance.

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1. INTRODUCTION

1.1 Background

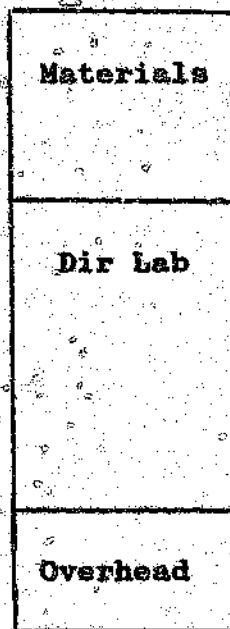
Cost control assists a company in attaining or maintaining competitive advantage. Porter (1985, p64) says "Cost advantage results if a firm achieves a lower cumulative cost of performing value activities than its competitors." This report examines zero base budgeting (ZBB) and cost driver analysis as two techniques in promoting cost control.

ZBB is a technique that endeavours to maximise the value adding properties of discretionary costs. Production, or volume related costs, are excluded from the ZBB process as input/output relationships are understood (Austin and Cheek, 1987). ZBB directs managers to examine each expense within their area of responsibility and then justify the existence of expenses by the outputs that they generate. This is summarised on a decision package. The decision packages for the company are evaluated and ranked. This process is a tool that first, ideally eliminates expenditure for which there are no outputs, and secondly provides a mechanism to objectively accept or reject expenses from decision packages if there is a constraint on the overall allocation of funds. This is superior to arbitrarily cutting expenditure.

Cost driver analysis or activity based costing (ABC) examines how overheads (and direct labour) are created by activities in a

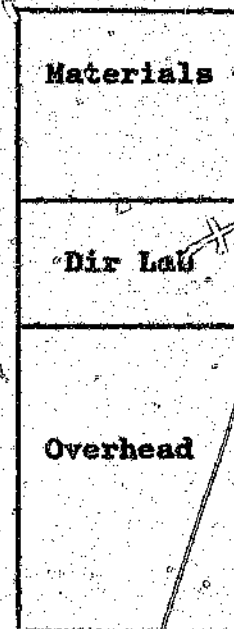
company. Porter (1985) says that the grouping of, and analysis of, overheads in costing systems are unsuitable in assisting management to understand, and thus control, these overheads. Johnson and Kaplan (1987) say that costing systems are designed to accommodate the manufacturing structures that were prevalent in the first half of this century. Cost structures have changed as set out diagrammatically below:

Early 20th Century



Few products

Late 20th Century



Many products

Traditional costing systems commonly allocate overheads to products on the basis of direct labour. When the percentage of overheads to total cost is low and the product range limited, the arbitrary allocation of overheads does not materially distort product costs. With overheads and product range increasing the traditional method of allocating overheads is obsolete and the

literature surveyed quoted a number of instances where product costs are significantly distorted by using this method. This in turn leads to wrong decisions being made with respect to pricing, and to which products to promote and divest, with adverse effects on a company's competitive position.

The analysis of cost drivers is a tool that, first, facilitates strategic positioning by a company and secondly aids cost control and reduction by providing an understanding of cost structure.

1.2 The Problem statement

Competitive advantage is maintained by either providing products at a cost lower than that of competitors or by providing a differentiated product at equivalent cost to the competitor (Porter, 1985; Porter and Millar, 1985; Shank and Govindarajan, 1989). The purpose of this research is to examine ZBB and cost driver analysis as two techniques in assisting a company to minimise costs and to obtain optimum output for costs employed.

The writer of this report worked for a company that earned high margins from its product range and was not overly concerned with rigorously controlling costs. A subsequent reduction in these margins arose from employees resigning and setting up in competition. Counter-action was taken by the company by absorbing another fifty percent turnover from a sister company on the assumption that the overheads accruing to the new business acquired could be eliminated and the activities handled by the

acquiring company. The newly expanded company was budgeted to make up for the shortfall in margins. This course of action was preferred as the view of the company was that the high level of margins could never be regained. The company had carried five hundred product lines, ninety debtors, and produced three hundred invoices per month. The new product range, despite its lower sales value, carried four thousand products, two hundred debtors, and required two thousand invoices per month. The administration department which had operated on five persons expanded to thirteen persons over time and a major upgrade of computer hardware was carried out and senior DP personnel employed to handle the increase in transactions. Difficulties arose in convincing senior management that these resources were required as they could only understand the difference in sales value. It took computer crashes, customers constantly phoning in with complaints of debtors' accounts in disarray, customers complaining of not being billed for deliveries and an horrendous management letter from the auditors to convince management that the acquisition had created activity out of proportion to the sales value of the acquired business. If ABC was a technique included in standard textbooks perhaps this process could have been avoided.

Expenditure on DP, accounting and internal sales activities was restricted, particularly with respect to persons employed.

Expenditure in providing demonstration stock to customers and entertainment exceeded R20,000 per month. The sole decision by the customer to purchase, however, was based on price. Thus

internal controls fell down and resources, that could have prevented this, were wasted on customers. A system of decision packages quantifying outputs for inputs would probably have prevented this misallocation of resources.

1.3 Statement of purpose

The report intends to show that ZBB and cost driver analysis are both valid techniques to assist in maximising outputs for cost inputs.

1.4 Reasons for the research

From 1983 onwards South Africa has experienced economic pressures brought on by the high incidence of debt, sanctions, inflation, and militant trade unionism. These determinants have introduced greater uncertainty into business. To plan ahead, based on the past, is dangerous. To assume that existing structures and cost relationships that work for today will be acceptable for tomorrow may result in a company losing competitive edge or even falling into a loss position.

It is proposed that the use of ZBB and cost driver analysis are both valid, but different, disciplines in assisting companies to manage the external pressures brought to bear and that their use will assist companies to maintain or attain competitive advantage.

1.5 Objectives and scope of the study

- Objective 1** To examine the literature on ZBB and cost driver theory and to compare and contrast the theories.
- Objective 2** To investigate by means of case study the application of ZBB and ABC methodology. From this to examine the benefits, similarities and differences of the two techniques.
- Objective 3** To compare and contrast the findings in the case studies with the relevant literature and to draw conclusions on ZBB and ABC.

1.6 Limitations

The literature surveyed covers a representative cross section of discussion on ZBB and cost drivers. The case studies however concentrate on small isolated areas. Specific limitations are:

- (i) The first case study examines a trading company. ABC in this study covers only non manufacturing expenses whereas the literary survey discusses all expense types.
- (ii) ZBB was only applied to one department in a small company in the first case study. Therefore the techniques of evaluating and ranking decision packages are not covered.

(iii) Two product lines were adequately separated and costed by employing a scratch budget in the second case study. However it was not possible to analyse these lines by employing ABC and assumptions had to be made about the transactions driving costs for these two lines. It is unlikely that this limitation will undermine the conclusions drawn from the case study.

1.7 Definition of terms

ABC Activity based costing

Discretionary costs

Expenses that have no particular relation to volume and are not subject to ordinary engineering input-output analysis. They cover the service and support areas of an organisation. Examples are research and development, advertising, sales promotions and consulting fees. The option to spend or not spend is available to management for discretionary costs.

Scratch budget

All revenues and all resources or expenses are built up from zero base without reference to historical records. However it is not ZBB as decision packages are not employed and incremental levels of expenditure for each package are not examined.

Traditional Accounting or traditional costing

An accounting method that assigns factory overhead costs to products on the basis of direct labour hours employed in manufacturing those products. Alternatives to direct labour hours, such as machine hours, can be used to allocate overhead. The main criticism is that the allocation is arbitrary and not scientific.

Traditional, or incremental, budgeting

A budgeting method that accepts present expenses as necessary to an organisations requirements. Also a method that extrapolates future performance on historical data.

Waste

Is defined in the Oxford dictionary as "superfluous, no longer serving a purpose, left over after use." The context of waste in this report covers unnecessary expenditure and the employment of unnecessary persons (per case study 2). It does not mean people are a waste, simply that their occupation is not needed in a specific circumstance. Non-essential costs also fall under the aegis of waste in this report.

ZBB

Zero base budgeting

2. SURVEY OF RELEVANT LITERATURE

2.1 INTRODUCTION

The literature survey examines zero base budgeting and activity/cost driver analysis with a view to enhancing cost control and improving competitive advantage. Shank and Govindarajan (1989,p39) say "Both intuitively and theoretically, competitive advantage in the market place ultimately derives from 'providing better customer value for equivalent cost' or 'equivalent customer value for lower cost'." If essential costs are minimised and a company understands what revenues can be ascribed to what costs then there is a wherewithal to optimise cost efficiency and competitive advantage which Worthy (1987) says is assisted by accurate cost information.

The annual budget is the main mechanism for resource allocation and overhead management (Morrow and Connolly, 1991). The literature says that normal or "incremental" budgeting (which assumes that previous expenses are justifiable in the budget simply because they exist at present) allows for cost inefficiencies to continue. Zero base budgeting is a technique that aims to eradicate this deficiency. By creating the possibility of a program's dismantlement the issue of its necessity is forced to be examined (Sarsfield, 1976) and this discipline over costs aims to eliminate unnecessary or duplicated effort (Austin and Cheek, 1979). A further weakness in conventional budgeting is that the review process frequently

results in budgets being reduced on a percentage basis over cost centres (Sephton and Ward, 1990) whereas ZBB ranks the importance of expenses and thus provides a more objective rationale for cost reduction.

The literature concurs that manufacturing structures have changed over the last few decades particularly with respect to the emergence of "just in time" (JIT) manufacture, total quality approach (Dugdale, 1990a), short product life cycles (Johnson and Kaplan, 1987), product complexity and a major shift in the make up of labour and overhead costs. "Traditional" costing systems assume that a high percentage of costs are comprised of labour, and products are costed by first allocating labour hours to each product and thereafter allocating overheads on a similar basis. However Worthy (1987) and Drury (1989) say that labour is now a small percentage of costs and that overheads have increased dramatically with the result that the methods used to allocate costs among different products are redundant (Worthy, 1987) and product costs are skewed (Cooper and Kaplan, 1988a; Seed, 1990). Only six companies out of the thirty two researched by Mackey (1987) actually used their costing system for pricing which Cooper (1989) indicates is symptomatic of obsolete costing systems. Frank, Fisher and Wilkie (1989) point out that the decisional purposes and assumptions of a costing system are unquestioned when a plant is highly profitable. However when margins reduce or profits are squeezed the need for accurate product cost information is critical (Cooper, 1989) and again the shortfalls of traditional costing systems become apparent.

Activity based costing (ABC) recognises that overheads are related to products in a more complex manner than labour hours worked or volume throughput. Hayde (1990,p52) says that "... overhead is increasingly being seen as a contributor to product value, not just as a burden that has to be 'smeared' across production on some arbitrary basis." ABC endeavours to tie overheads and labour to the products that cause them. The activities that are driven by products are decided on, costs employed by these activities are pooled into the activity centre and then the activity cost centre is allocated to products on the basis of the products' consumption or use of the activity. This consumption is frequently the number of transactions generated by the product, be it set up times or work orders generated. Cooper (1990c) calls this a two tier allocation procedure. Over and above being a method to more accurately cost out products, activity costing is also recommended for controlling and managing costs by understanding the events and activities which drive them (Dugdale, 1990b) as it is activities that cause costs, not products, and therefore cost control is best achieved by managing activities (Hayde, 1990; Sephton and Ward, 1990).

Porter (1985) discusses cost drivers in terms of strategies such as lowering costs by economies of scale or learning, or extrapolating a company's value chain with the judicious use of linkages and these serve to reduce cost or alternatively optimise expenditure by improving differentiation.

The literature surveyed examines cost control first from a bottom

up process through zero base budgeting and secondly examines cost management by studying cost driver or activity costing theory.

2.2 ZERO BASE BUDGETING

2.2.1 Normal Budgeting

An integral part of management activity is planning and budgets are an important tool in serving that planning function (Merchant, 1981). The budgeting process offers a tool to explore cost relationships and arrange them to maximise performance. The understanding of expense behaviour patterns are key components in intelligent cost planning (Horngren, 1972). A successful company will evaluate strategic options (Ames, 1989) and from this set long term strategy. Good budgets are linked to these long term plans and reduced to quantitative, short term targets (Umapathy, 1987; Ramanujam & Venkatraman, 1987). A budget assists management to chart its course in advance and facilitates the co-ordination and control of operations (Weisch, 1971; Wise, 1982).

Pogue (1988a,p57) states that "...budgets compel planning... in business and ask some questions

- what is the objective of the business - where does it plan to go?
- how does it plan to achieve its objective?
- what resources does it need?
- how can it co-ordinate the functions to achieve its

objective?"

The process of budget preparation provides the opportunity to test new ideas, appraise strategy and select the budget option that is most likely to achieve business objectives (Arnold, 1989). Sales, in general, is the first budget to be prepared and is viewed as the foundation for many other budgets (Pogue, 1988). From there material, labour, and production costs are derived resulting in a contribution from which fixed expenses are deducted to arrive at an operating profit. Working capital requirements are calculated on sales and resource activity and from this cash flow can be derived. Figure 1 sets out the process of budget preparation. Normally budgets are arrived at by a combination of "bottom up" and "top down" preparation (Churchill, 1984). Management tell subordinates the overall objectives and performance ratios required (e.g. profit/sales %, expense levels, return on capital), line managers prepare and present their budgets, and then a negotiated level of sales, expenses, and assets employed is agreed by top management. The line managers then adjust their budgets to fall within the agreed limits.

The budget serves as a critical control function as it is the reference point by which company performance and activity is measured (Otley, 1978; Bowhill, 1987). Most companies report actual results against budgets and investigate variances, particularly when the actual results are unfavourable when compared to budget.

FIGURE 1 PROCESS OF BUDGET PREPARATION

Revenue and cost elements	Process in building revenue and cost elements
Sales Materials Labour Factory overheads	By product / by division / by salesman Derived from the sales budget According to product throughput As built up by department heads
Contribution	
Fixed Costs - Selling - Administration - Research and development - Others	As built up by department heads -----" -----" -----"
Operating profit	
=====	
ASSETS EMPLOYED	
Fixed assets Debtors Stock Creditors	Per-production activity As derived from sales As derived from cost of sales As derived from stock purchases and other expenses
Operating Capital	

The literature affirms that budgets are important and worthwhile and are a major contribution to the planning and control functions of a company. A major criticism of budgets has been that they tend to be extrapolations of past performance (Anes, 1989; Morden, 1986) and that budgets assume that existing expenses are necessary, that activities or functions are being performed in the most cost effective manner and that they will continue to be necessary and cost effective (Cheek, 1977). Some of the weaknesses of this type of budget are firstly, that history has inbuilt inefficiencies. For example a product that was once a profit maker may not be so today (Finkin, 1988a). Existing functions and expenditures can be allowed to continue which would be identified as obsolete if a critical examination was carried out (Morden, 1986). Cheek (1977) cites the example of an organisation staffing up with technicians and professionals to a level of perfection out of all proportion to the firm's needs. Secondly, Bowhill (1987) says that budgets can create incorrect reference levels and distort measurements of company performance where circumstances have changed. This would also apply to a budget which was based on an organisational structure pervaded with inefficiencies and unnecessary activities and functions. Thirdly, expenses are normally summarised by department, such as marketing and finance, but management don't know what they're getting for their money. Expenses are viewed as inputs tied to functions rather than outputs tied to objectives (Cheek, 1977). Fourthly, the outputs of departments are not fully understood by management when reviewing a budget based on an extrapolation of the previous year. Therefore

proposed cuts in expenditure (in order to improve profitability) can be arbitrarily split among all departments whereas outputs may vary from one to the other. Further the anticipation of this reaction on review encourages budget padding to survive the arbitrary cuts (Brown, 1981). Unfortunately the responsible manager who requests exact expenditure needs is penalised and the political manager is encouraged in his budget game play (Cheek, 1977).

Dean and Cowen (1979a) consider management to be aware of the deficiencies of traditional or incremental budgeting. They will examine efficiencies and structures outside of the budget with a view to innovative change. Zero base budgeting (ZBB) is an attempt to obviate the weaknesses of traditional budgeting which, says Dermer (1977,p249), relies "... on the last period as a frame of reference rather than overall analysis and synthesis." Among other things ZBB encourages innovative thinking and non acceptance of existing expenses/structures at low levels in the organisation and can therefore be used as a tool to extrapolate resources and eliminate duplication. The literature surveyed considers traditional budgeting to be unsuitable in aiding this process.

2.2.2 Circumstances leading to zero base budgeting

Duffy (1989,p166) says that ZBB emerged as a tool to assist "...organisations to adapt to a changing environment where

resources are becoming scarce, profits are being threatened and changes are occurring with increasing frequency." ZBB was developed to overcome the deficiencies of incremental budgets (Dean and Cowen, 1989a) as they built on the previous years performance and were unable to cater for radical change.

With revenues levelling off, or with expenses running out of control, ZBB emerged as a viable technique for reducing costs (Brown, 1981) without endangering operations and presenting budget alternatives so as to better control costs (Cowen and Dean, 1979). Whilst personnel costs, for example, are direct and visible most benefits derived from their effective operation are intangible (Cheek, 1973) and ZBB is a suitable technique to measure the effectiveness of these costs.

Various techniques had been developed to assist organisations in their quest for cost control and ZBB drew on these concepts. According to Cheek (1977) capital budgeting led to cash being voted on the basis of a cost versus benefit analysis. Overhead value analysis forced managers who incurred a cost to work closely with the beneficiary of the service and this encouraged a cost/benefit analysis. The cost was only approved if the receiving manager signed acceptance. Project management focused on evaluating and ranking outputs (or the value of results). External pressures forcing change, requiring cost control and more efficient resource allocation led to the emergence of ZBB which can assist in handling these additional requirements.

2.2.3 Description of Zero base budgeting

ZBB is a bottom up operating, planning and budgeting process (Cheek, 1977) which requires each manager to re-evaluate each activity he is responsible for and ask if they are still necessary or if they can be reduced or eliminated (Pogue, 1984). It forces a justification of each cost centre or line of cost (Pearson and Michael, 1981) and removes the implied right of existing activities to receive continued resource allocation (Morden, 1986). Managers seek to identify what their operations are doing (Austin and Cheek, 1979), set objectives and consider alternative ways of achieving those objectives (Morden, 1986). Alternatives are then broken down into incremental levels of effort (Pyhrr, 1970) and the costs and benefits of each level assessed. The consequences of non-approval are described (Austin and Cheek, 1979) and the objective, alternatives and different levels necessary to achieve each alternative are summarised on a decision package. These are evaluated by systematic analysis and ranked in order of importance from which packages are accepted or deferred or eliminated (Austin and Cheek, 1979; Cheek, 1977).

The process is more complex than that employed in incremental budgeting and Cheek (1977) and Austin and Cheek (1979) consider that it needs the support and commitment of top management to make it work and that it operates best in an environment with an open, participative management style in which broader goals are shared with the rank and file. The various decision packages are aggregated and from this a consolidated budget is prepared. This

methodology aims to complete a budget which is free of unnecessary expenditure, free of duplicated efforts and in which resources are better allocated.

2.2.4 The Decision Package and Ranking procedure

Pyhrr (1970, pp112-114) defines a decision package as a "...document that identifies and describes a specific activity in such a manner that management can (a) evaluate it and rank it against other activities competing for the same or limited resources and (b) decide whether to approve it or disapprove it ... This kind of format encourages the manager to scrutinize each operation for all possible cost reduction and operating improvements for base and incremental packages, as well as all discretionary packages." Figure 2 sets out a sample decision package prepared by Cheek (1973). Key criterion are self explanatory - description of activity; ease or difficulty in applying the activity; the anticipated revenue versus the cost; the intangible benefits and the consequences of not acting. Figures 3 and 4 (from Austin and Cheek, 1979) reflect a decision package first at the lowest level necessary to provide a service, per Figure 3, and then the additional or incremental level of effort, per Figure 4, necessary to generate additional revenue. As the revenue exceeds the cost in Figure 4 the decision package is viable. However if there is a constraint on the allocation of funds for the company as a whole then this decision package can be compared to others and ranked. A standard is set to allocate

FIGURE 2

A SAMPLE DECISION PACKAGE

1. Define and describe the program

2. Identify and segregate legally required efforts

3. Evaluate feasibility
(a) State-of-the-art implications.
(b) Ease of implementation.
(c) Net economic benefits,....

PROGRAM NAME: Service Force Job Enrichment Program Program No. 16			
DESCRIPTION (objectives, target population, implementation schedule) To extend the job enrichment program for the service force - as piloted in Spring Falls, Avon Hills and Maplewood Branches - to all branches between 1972 and 1976. Is program legally required? ☐ Yes ☒ No			
STATE OF THE ART ☒ High ☐ Medium ☐ Low			
EASE OF IMPLEMENTATION ☐ High ☐ Medium ☒ Low			
ECONOMIC BENEFIT ☒ High ☐ Medium ☐ Low			
Identifiable benefits: Reduction in service force turnover of 1 point. Extension of 1.2 point reduction in absenteeism as demonstrated in pilot project. Extension of 5% increase in service force productivity, as demonstrated in initial efforts. Total benefits	Potential revenue impact	Probability of occurrence	Probable gross benefit (cost)
	\$ 450,000	.2	\$ 90,000
	\$ 2,132,500	.8	\$ 1,706,000
	\$85,500,000	.1	\$ 8,550,000
	\$88,082,500	12	\$10,346,000
Tangible costs to Xerox of acting: Group personnel staff time to develop program, and line management time to implement program in all branches. Total costs			
	(\$ 472,950)	.9	\$ 425,655
	(\$ 472,950)	.9	\$ 425,655
Probable net benefits (cost):			\$ 9,920,345
Intangible benefits Increased morale in service service force with improved customer service and satisfaction "Contagious effect" of job enrichment to other groups, e.g. sales and clericals. Improved service manager development with concurrent sharpening of their motivational skills. As an extreme example, one manager at Avon Hills increased his team's productivity 70%			
ECONOMIC RISKS ☒ High ☐ Medium ☐ Low			
Possible consequences of not acting: Continued escalation of service costs as a percent of revenue			
ASSUMPTIONS AND OTHER CONSIDERATIONS Cost estimator assume 4.4 man years of group staff time. .26 man years of branch manager time and 15.8 man years of service manager time to implement program in a population of 1,053 service managers. Benefit estimates assume elimination of 3 days absenteeism per month for each of 1,053 service teams, favourable productivity and that turnover experience in pilot branches can be cascaded to all branches.			

(d) Economic risks

FIGURE 3: A DECISION PACKAGE REFLECTING MINIMUM RESOURCES REQUIRED FOR A COST CENTRE

Division: CONSUMER PRODUCTS		Level 1 OF 2 Rank:			
Decision Unit(s) BROCHURE MAILING		Department: DIRECT MAIL			
		Ranking of Other Levels:			
Desired Results: To mail 10,000 brochures a week with no more than a 20% duplication factor.	Resources Required	Current Year	Budget Year		
			This Level	Accum.	% of Curr. Year
	Personnel (Sal./Hrly)	2/5	1/4	1/4	
	Salary \$ (Non-union)	25,000	15,000	15,000	60
	Hourly (Union) \$	35,000	28,000	28,000	80
	Other \$	5,000	3,000	3,000	60
	Total	65,000	46,000	46,000	71
Description of Activity: Names of titles are collected from Marketing Department, put on address plates. After brochures are returned from printer, names and addresses are affixed to brochures, and brochures are sorted and bundled by zip code and mailed.					
How and When Accomplished: 3 clerks go through lists and merge them with current lists. 1 clerk affixed addresses, 1 clerk sorts, bundles, and delivers to post office.					
Alternative Ways - Why Rejected: 1. Have Marketing Department absorb in their activity. Rejected - prime function of Marketing is to generate names. 2. Use in-house EDP. Rejected - cost would be \$80,000. 3. Use outside list house. Rejected - cost would be \$65,000					
Benefits of Retaining Result/Activity: Direct mail is principal source of revenue. The result is based upon 15% orders ± \$20 per order. This is minimum needed to operate. (Percentage on net after duplication) \$1,248,000 revenue per year.					
Consequences if Result/Activity is Eliminated: Unless another way to generate orders is developed, business would not function.					
Prepared By: S. Edroe		Date: 10/1/1991		Approved By: _____ Date: _____	

FIGURE 4: A DECISION PACKAGE REFLECTING BENEFITS OBTAINED FOR AN INCREMENTAL LEVEL OF EFFORT

Division: CONSUMER PRODUCTS		Level 2 OF 3				Rank: 0
Decision Unit(s) BROCHURE MAILING		Department: DIRECT MAIL				
		Ranking of Other Levels:				
Desired Results: To mail 5,000 additional brochures a week with no more than a 15% duplication factor.	Resources Required	Current Year	Budget Year			
			This Level	Accum.	% of Curr. Year	
	Personnel (Sal./Hrly)	2/5	1/1	2/5		
	Salary \$ (Non-union)	25,000	10,000	25,000	100	
	Hourly (Union) \$	35,000	7,000	35,000	100	
	Other \$	5,000	2,000	5,000	100	
	Total	65,000	19,000	65,000	100	
Description of Activity: Same as Level 1, plus clerks take turns looking for duplications.						
How and When Accomplished: 1 clerk to merge lists, 1 clerk to help affix addresses, sort, bundle, and deliver to post office.						
Alternative Ways - Why Rejected: Same as Level 1. (outside list house may be viable option. See attached Decision Package 2A.)						
Benefits of Retaining Result/Activity: Result based on 10% orders at \$12 per order (percentage on net after duplication). Percentage and dollars per order lower than for Level 1 because names not as prime as Level 1. \$265,000 revenue per year.						
Consequences if Result/Activity is Eliminated: Incremental revenue would not occur.						
Prepared By: S. Edroe		Date: 10/1/1991	Approved By:		Date:	

points for each package and a committee convenes to rank the packages. Figure 5 (from Cheek, 1977) sets out an example of the ranking order of packages and which ones were approved and which ones were rejected. The weakness in Figure 5 is that health and safety is rejected as it did not (apparently) generate income. However it is a legal requirement and therefore has to be approved as the consequences of non-approval could be that the premises of the company are closed. Ranking can be more complex than indicated in Figure 5. Sometimes multiple, as opposed to single, standards are used in the evaluation process. The process is formal and attempts to objectively assess expenditure. If expenses are cut by, say, 10% in which to reduce are more logically identified and method is superior to the arbitrary reductions that can occur in incremental budgeting.

2.2.5 Cost control and resource allocation

Austin and Cheek (1979, p7) say "If ZBB is viewed merely as a budgetary process then an obvious benefit would be its capability to control overhead costs." By measuring benefits against cost obvious redundancies can be identified and eliminated (Cheek, 1977) and duplication can be pinpointed throughout the organisation (Austin and Cheek, 1977). Firms have been able to use ZBB in order to achieve short term cost control (Dean and Cowen, 1979b). The Southern California Edison Corporation employed zero base operational planning and budgeting and Anderson (1976) says that it assisted in reducing personnel by 9%

FIGURE 5 AN EXAMPLE OF RANKING METHODOLOGY EMPLOYED TO FACILITATE FUNDS ALLOCATION IN ZBB

Program Ranking	Program Number	Program Name	Estimated Average Net benefit (Cost)*	
			1 year	5 year Average
1	4	New-Product launch	*(1.5)	\$5.0
2	7	Old-Product repositioning	3.8	3.4
3	6	Job enrichment program	(0.5)	1.1
4	5	Physical distr. system	0.9	0.6
			CUT - OFF +	
5	3	Executive retreat	(0.3)	(0.2)
6	1	Health and safety	(0.6)	(0.3)
7	2	Executive core staff	(2.8)	(2.8)
		TOTAL	\$(1.0)	\$6.8

* In millions of dollars

+ Subtotals to \$2.7 million in budget year and \$10.0 million per year over the next five years

and promoting ongoing cost reductions.

Pyhrr (1970 and 1976) says that ZBB is best applied to service and support areas. Duffy (1989) concurs and says it is not considered to be applicable to direct production and other manufacturing costs. In this area, say Austin and Cheek (1979), precise and readily obtainable production standards are available from which costs can be derived whereas this is not available from people and capital intensive projects normally falling under the aegis of overhead costs. However Pyhrr (1976) says that ZBB cannot be applied to direct labour, materials and overheads associated with production operations because the costs associated with production operations are not discretionary and therefore no benefit can be obtained from increasing or decreasing these expenditures. Leven (1977) says ZBB applies only to non volume related expenditure. Overheads are ranged over the organisation (Cheek, 1977) and ZBB can be applied to overheads in the factory that are not volume related as much as to marketing and administration overheads. Pyhrr (1970) says that non manufacturing expenses constituted 25% of Texas Instrument's total budget where he implemented the system. A 10% reduction in costs, without sacrificing outputs, would impact materially on the company's performance.

The process in preparing and ranking decision packages theoretically should ensure that only those costs maximising benefits are approved and, therefore, a company would enjoy a better allocation of its resources. Brown (1981) and Dean &

Cowen (1979a) say that ZBB specifically aims and enables a firm to allocate resources to those operations contributing the most to the organisation's goals. Austin and Cheek (1979) report that the response to a questionnaire confirmed that users found that the major benefit of ZBB has been achieved in reallocating funds and reassigning personnel. Suver and Brown (1977) say the most effective budget possible should be achieved as each activity of an organisation has been scrutinised and then continued, modified or discarded.

2.2.6. Problems in Zero Base Budgeting

Austin and Cheek (1979) say that because ZBB is a decentralised process, more people are involved and Lee and Shim (1984), Brown (1981) and Suver and Brown (1977) say that the most serious problems facing the zero base approach is the time and effort necessary to conduct the process. For this reason hybrids have developed. Modified ZBB assumes that 80% of actual, or previous budget, expenses are acceptable and zero basing is applied only to the remaining 20 %. Performance auditing, as described by Brown (1981), examines only areas where questions concerning effectiveness, economy and efficiency have arisen. Zero base budgets are carried out in these instances. Incremental budgeting is employed for other areas considered effective. Whilst the benefits of a total zero base budget are not all available from these hybrids, the cost, time and effort are greatly reduced by employing them. A major aim of ZBB is to prevent expense padding but because ZBB is a bottom up process lower level managers can play games by hiding information and

disguising inefficiencies (Suver and Brown, 1987). Thus padding, that can occur in incremental budgeting, can also occur in ZBB. Also a strategic purpose in ZBB is to sharpen the analytical skills of management at all levels and this can be problematic if managers are inflexible and operate successfully because of rigid structures (Austin and Cheek, 1979; Cheek, 1977). Some imagination has to be displayed when considering alternatives in preparing decision packages.

In examining the application of ZBB to local government Cowen and Dean (1979) cited an instance where it was difficult to prepare and rank decision packages for the staff and support areas because their output was so removed from the primary mission of the organisation but then one could question why these activities could be justified at all. Brown (1981) considers that output measurements can be difficult to obtain for discretionary expenses although the methodology of decision packages would force the issue that the expense is either redundant or generates benefits.

The main problem in ZBB would appear to be the work involved as a great deal of time and thought at all levels has to be expended if ZBB is to operate successfully.

2.2.7 Advantages of zero base budgeting and summary

Austin and Cheek (1979, p3) reproduce the findings of a survey by the American Management Association which asked "What purpose

does ZBB serve in your organisation?" The findings are summarised in Figure 6 below.

FIGURE 6 RESULTS OF SURVEY ON USES OF ZBB

<u>Purpose of ZBB</u>	<u>Number</u>	<u>Percent</u>
To better allocate resources	17	30%
To improve decision making	14	25%
To facilitate planning	11	20%
To reduce costs/personnel	7	12%
Miscellaneous	<u>7</u>	<u>13%</u>
	<u>56</u>	<u>100%</u>

Whilst not allocating a rank the literature affirms the above benefits. Dean and Cowen (1979a) and Brown (1981) confirm that resources are better utilised. Williams (1981) agrees that decision making is improved and Pyhrr (1970), Suver and Brown (1977) and Dean and Cowen (1979b) concur that costs and personnel are reduced. Suver and Brown (1977) say that miscellaneous benefits accrue by ensuring that each discretionary cost in an organisation is defined and categorised and that it educates new employees who are involved in the budgeting process. Dean and Cowen (1979a) consider the search for alternatives to be a key factor in the use of ZBB. Finally Cheek (1977) confirms that ZBB supports the planning (strategic analysis) functions of an organisation.

ZBB endeavours to inform top management why expenses are incurred

and what benefits are obtained from them. It assists in cutting out redundant or duplicated effort. Pyhrr (1976) and Cheek (1973 & 1977) say that discretionary costs are of significance in a manufacturing organisation because they provide management with the leverage it needs for affecting profitability and therefore the allocation and prioritisation of these costs are important. ZBB methodology should assist in ensuring that revenue generating overheads are retained, if not expanded, and that redundant expenditure is eliminated. ZBB emerges from the literature as a systematic and formal method to control costs and allocate resources and appears to be superior to the statistical extrapolations that can be employed in traditional, or incremental, budgeting.

2.3 COST DRIVER THEORY

2.3.1 Introduction

The literature survey highlights and reinforces that cost structures within manufacturing companies have changed over the last thirty years. Labour is no longer the predominant cost but now represents only a small portion of manufacturing costs (Lovell, 1988; Sheridan, 1989). An increasing portion of manufacturing costs are fixed (Howell and Soucy, 1987b) and marketing, distribution and other overhead costs have increased dramatically (Drury, 1989; Cooper and Kaplan, 1988b). Companies have expanded into producing a wide range of products, as compared to a few products, and the overhead structure has

expanded to service this range of products (Johnson and Kaplan, 1987). If one assumes that the cost/product structure is optimal then the costing system needs to correctly allocate overheads to the products that drive them. However many companies continue to employ traditional costing systems (Cooper and Kaplan, 1988b) which operate on the premise that labour is a key cost component in manufacturing and that because factory overheads are a small percentage of costs they can be conveniently allocated to products on the basis of labour hours (Johnson and Kaplan, 1987). Some companies understand the limitations inherent in traditional costing systems and carry out ad hoc exercises to correctly allocate overheads to products (Cooper, 1989) in order to set selling prices correctly. Activity based costing (ABC) is a new alternative to traditional costing which attempts to cater for the change in cost structure and is discussed later in more detail. Is a wide product range and a high overhead structure (to cater for the range) necessarily the right way to run a business? Porter (1985) advocates analysing inherent cost drivers driving a business in order to maximise profits. Authors such as Bellis-Jones and Hand (1989), O'Guin (1990) and Howell and Soucy (1987a) advocate focus as a strategy to restructure a company in order to enhance returns.

The purpose of this section is to define cost drivers, examine how they impact on the revenue, cost, volume and profit structure of a business and to consider how an understanding of them can be employed to restructure a company to exploit them. Given that

overheads are a necessary resource, alternatives in minimising them are examined.

2.3.2 Cost Drivers - explanation and definition

To make and supply one or many products to a customer requires some or all of the resources described in Figure 7 which represents the structure of a typical manufacturing organisation. Cost driver theory examines how these interrelate and how sales and prime input to sales drive costs.

Drury (1989,p61) says that the "...forces behind overhead costs are described as cost drivers. Cost drivers can be defined as those activities or transactions that are significant determinants of costs." Resources are consumed by activities and activities are cost drivers. They are the cause of cost (Romano, 1989a). With respect to factory overheads Innes and Mitchell (1990,p28) consider cost drivers to represent "...a workload factor relating to the activity which (a) has a strong causal relationship with activity cost and (b) can be related to specific product lines." It is activities that draw on costs and activities are therefore the cost drivers. The activities turn exist to service products and therefore products need to be costed to the extent that they draw on, or create, an activity cost centre. ABC can include direct labour as another overhead cost element in an activity. McNair, Mosconi and Norris (1989) say that the direct labour/overhead distinction is irrelevant when examining the value adding components of a product. In ABC

FIGURE 7 COST STRUCTURE OF A MANUFACTURING ORGANISATION AND THE PURPOSE OF THE COSTS

TYPE OF COST		PURPOSE OF COST
End Object	SALES	
Resource	MATERIALS	Product input
	DIRECT LABOUR	Processing products
	FACTORY OVERHEADS	Machinery support materials handling, logistics
	<u>GROSS PROFIT</u>	
	SELLING	Products to customer
	MARKETING	Product strategy/pricing
	ADMIN AND FINANCE	Payroll, record keeping management feedback
	RESEARCH AND DEV.	Product development
	OTHERS	Patents, legal costs etc
	<u>Profit before int & tax</u>	
=====		
Resource	FIXED ASSETS	Machinery to process products
	DEBTORS	Customer facility to sell
	STOCK	To ensure smooth material flow and product supply for customers
Input	CREDITORS	

overheads cover not only activities applicable to the factory but expenses such as marketing and distribution (Worthy, 1987).

Porter (1985) views the strategies that a company pursues as being cost drivers. He says that there are ten determinants and these are economies of scale, learning and spillover, pattern of capacity utilisation, linkages, interrelationships, integration, timing, discretionary policies independent of other cost drivers, location and institutional factors. Appendix A discusses them in more detail. These cost drivers can be influenced by products, customers and strategy and he advocates realigning the resources of a company to maximise them.

Because overheads were a smaller percentage of total costs and allocated on a labour basis traditional costing has encouraged the use of marginal costing. Standard textbooks (e.g. Horngren, 1972) understand the stepping effect of fixed costs but assume that decision making is relevant within a certain level of volume or activity. Materials and direct labour are viewed as variable to increases in volume. All other costs are fixed (Piper and Walley, 1990). Therefore product profitability is calculated on sales less materials and direct costs. The profit at this stage is regarded as a contribution to fixed costs. Absorption costing, which allocates fixed costs to products on an arbitrary basis, is criticised on the grounds that the allocation of a fixed cost to a product may then reflect a loss for that product and therefore is likely to be discontinued. As fixed costs cannot be altered the contribution, as analysed by marginal

costing, will be lost and therefore overall profitability decreased.

Dugdale (1990b) draws on Kaplan's exposition that a once off execution of a special sales order may well be marginal to the business and not cause an increase in overhead costs but a continuation of these sales will result in support departments being expanded to cater for the additional activity. Cost driven theory accepts that all costs are variable in the long term (Howell and Soucy, 1987b) and that cost interrelationships are more complex. For example a low volume product requiring printing will generate activity in procurement and stores in order to cater for the dies, origination, inks and a multiplicity of parts necessary to support printing. Whereas a high volume, but simple, product will make few demands on procurement and stores logistics. Therefore changes in product mix will impact on the overhead structure. Some customers may purchase from a company on a contractual basis with complex terms and conditions of sale requiring detailed administration and tracking by the company which in turn will create an overhead structure to cater for the activity. Whereas other customers may require nothing more than an invoice therefore making no unusual demands on the administration.

Cost driver analysis endeavours to allocate costs to the products, customers and markets that create the type of overhead structures discussed above and therefore arrive at realistic product, customers and market profitabilities.

2.3.3 Cost drivers and revenue/cost/volume profit structures

Break-even analysis assumes that overheads are fixed and that volume increases for sales only results in cost increases for materials, direct labour and other identifiable variable costs (Horngren, 1972). Appendix B displays a textbook graph. Thus profits can be enhanced by cost cutting and volume increases using this premise. This simplistic model can encourage managers to improve profit results by increasing volumes without focusing on basic problems in their cost/profit structure (Ames and Hlavacek, 1990). There are a variety of actions other than this that can improve profit performance. In order to come up with a better cost/profit structure a company must examine everything it does in search of creative options to do things differently (Porter, 1985).

Overheads are necessary to run a business. Finkin (1989) affirms that a troubled organisation is usually missing important skills of all types (engineering, purchasing, financial, labour relations to name a few) and that these need to be in place for a company to operate successfully. Overheads are as important to the customer as are the physical processes on the shopfloor (Jean and Morrow, 1989) and overheads such as research and development, marketing and accounting, which are not considered value adding, should also be assigned to product costs (Estrenga, 1990). Johnson (1988) says that companies no longer compete chiefly on cost but also on quality and flexibility and therefore the necessary input costs cannot be constrained.

Traditional costing systems ignore the cost behaviour of non volume related costs (Romano, 1989b) which puts the company at a disadvantage as competitors, who understand how their costs are driven, improve their profitability trend (Bellis-Jones, 1989). To make an accounting system useful it is necessary to identify what really drives costs (Berlant, Browning and Foster, 1990) so that managers can initiate effective actions. Discussing activity based costing Ward and Patel (1990,p34) cite that its "... greatest value to date has been in understanding the behaviour of overhead costs and their relationship to products, services, customers and market segments. Accurate cost and thereby accurate profitability information, enables management to make the right decisions regarding the allocation of resources..."

Activity based costing (ABC) assumes that overhead and labour costs are not necessarily driven by volumes but that transactions are the real driving force behind manufacturing overheads (Miller and Vollmann, 1985). Jean and Morrow (1989) say that the underlying assumption inherent in ABC is that it is activities which cause cost, not products, and it is products which consume activities. ABC methodology pools costs into an activity centre and then allocates the cost to the products on the basis of consumption or transactions. An illustration is set out in Appendix C. Some products require many transactions and therefore they drive overhead costs up as a structure is necessary to cater for those transactions (Schmenner, 1988).

Without ABC the additional overhead driven by a particular product would be spread over other products. O'Guin (1990,p40) carried out a case study on a factory making plumbing parts and by applying ABC found that a product line reported as profitable under a traditional costing system appeared unprofitable when costs were allocated on the basis of transactions. Cooper (1989) says that poor costing manifests itself when customers don't mind paying price increases on products that appear profitable. The set up times are disproportionately high for low volume products resulting in poor machine utilisation and they tend to attract higher inventory levels and also cause significant accounting and paperwork costs (Finkin, 1988a). Whereas high volume products consume less resource per component (O'Guin, 1990, Cooper and Kaplan, 1988b) and thus high volume products are costed at a lower level under ABC than under traditional costing which, says Cooper (1990a), systematically undercosts small low volume products and overcosts high volume products.

An important assumption in ABC is that all costs are variable, if not in the short term, then in the long term. Many costs deemed to be fixed under traditional costing are in fact variable (Cooper and Kaplan, 1988b). In the short term few costs are variable but in the long term all costs are variable (Howell and Soucy, 1987b). Some resources are quickly affected by activities and others more slowly (Cooper, 1990b). Romano (1989b) considers that product/volume related costs are variable in the short term whereas activity/transaction related costs are variable in the long term. Therefore the results of a decision made in the light

of information disseminated by ABC may not be immediately apparent but it will be evident in the long term:

ABC does not pretend to be accurate but to only approximate costs (Cooper, 1990b). However Howell and Soucy (1987a,p27) reflect that financial data "...fails to reflect economic realities in ways that enable a manager to make well informed decisions."

Cooper and Kaplan (1988b,p100) say that "...it is better to be basically correct with ABC, say, within 5% or 10% of the actual demands a product makes on organisational resources, than to be precisely wrong (perhaps by as much as 200%) using outdated allocation techniques." ABC involves recording additional information over that required for financial reporting, such as purchase orders, number of deliveries, inspection times and the like (Roth and Borthick, 1989) and therefore some additional expense is required. The key to good ABC systems design lies in achieving a system that is economical to maintain and yet does not introduce excessive distortions (Cooper, 1990c) and therefore the trade off between measurement costs and cost of error means that the optimal cost system is not necessarily the most accurate cost system (Cooper, 1991). Roth and Borthick (1989) suggest that companies should focus on tracing major cost items to products to contain the expense of an ABC system. McNair et al (1989) say that being approximately right, versus precisely wrong, reflects a value added approach to management accounting systems.

ABC is a methodology that recognises that the key element in cost

driver theory is that overheads are driven by activities and transactions and that the key to controlling and reducing them is to develop a model that relates these costs to the forces behind them (Miller and Vollmann, 1985). In para 2.3.5 the power in understanding activity and product/customer mix is examined and a methodology to increase profits by manipulating cost drivers is developed.

2.3.4 Reducing non-essential costs

Cost leadership and differentiation are the two main areas in which a company can compete (Porter, 1985). In order to pursue either of these strategies and achieve competitiveness companies must remove wasted effort, i.e. non-value adding activities (Johnson, 1988). All activities must add value to a product. All the costs of manufacturing and non manufacturing that do not add any intrinsic value to the products being produced should be identified with the objective of eliminating these costs (Johnson, 1988; Howell and Soucy, 1988). Companies should undertake a review of overhead effectiveness to ensure that resources are focused on the needs of customers and not on unnecessary activities (Bellis-Jones, 1989). A company provided an expensive query facility answering any question about steel quality and tensile strength only to find that, whilst the service was extensively used, the potential customer finally bought on price (Finkin 1988b). Thus the cost of differentiation was a wasted effort and eliminated. Similarly buying executives were lavishly entertained only to base their final purchasing

decision on price criteria alone (Finkin 1988a). Again the entertainment cost was eliminated.)

Drucker (1990) is concerned that too much emphasis on cost cutting can stifle innovation and differentiation but Bellis-Jones and Hand (1989) say that the key to keeping overheads low is to identify what can be cut without involving major risks to the business. Porter (1985) recommends that cost reduction should be aggressively pursued on those activities that do not influence differentiation. If quality and reliability are the key selling points in a product, and the market is prepared to pay the price, then heavy expenditure in research and development, quality control, etc, is justified as they are value adding activities. But if cost/price is the key sales determinant then the bare minimum should be spent in getting a product to the customer. Where activities are necessary it is important to maintain a choke-hold on costs and find efficient ways to stretch budgets (Knowlton, 1989). It should be remembered that costs do not accidentally go down but that hard work and constant attention are necessary to achieve reductions (Porter, 1985). ABC recognises that it is activities that cause cost and not products and by identifying activities management are provided with more relevant information to promote cost reduction (Hayde, 1990; Dugdale, 1990b). Miller and Vollmann (1985, p150) say that there are "... three ways to managing overhead costs more effectively:

- analysing which transactions are necessary and improving the methods used to carry them out

- increasing the stability of operations
- relying on automation and systems integration."

As discussed in para 2.3.3 no costs are fixed as in the long run all costs are variable as costs are matched to the underlying level of the business (Rickwood, Coats and Stacey, 1987). Costs that are fixed for budgeting purposes at an existing plant (utilities, insurance, taxes) may be variable when the company contemplates closing the plant (Schmenner, 1984). This assumption is implicit in cost driver theory and managers need to be educated to the effect that these costs are controllable and to avoid a sunk cost bias (Howell and Soucy, 1988).

Cooper (1990c) recommends selecting cost drivers for measurement purposes in order to drive companies towards favourable or desired goals. Hitachi, in Japan, apply this concept by manipulating accounting information to motivate employees in achieving corporate targets. One plant uses labour to allocate overheads (at variance with ABC) in order to encourage automation (Hiromoto, 1988; Morgan and Prassanna, 1989) and another plant allocates overheads on the basis of the number of parts in a product model as reducing the number of parts and promoting the use of standard parts across product lines can lower costs dramatically (Hiromoto, 1988).

Another method in formatting information to encourage behavioural responses is discussed by Kanter (1989) who cites General Foods as putting overhead charges for corporate staff services on a

pay as you use basis. These staff must prove to the satisfaction of their internal customers that their services "add value". The cost of the overhead needs to be recovered via the charge outs. If after a year costs remained in that cost centre it would be apparent that the service was poorly regarded and unlikely to "add value" and thus identified as a cost to be disposed of. Conversely an over recovery would suggest that the service could be expanded. Weyerhaeuser company charges out on a similar basis. Their Information Systems department was forced to lay off a large number of employees and obtain outside work in order to meet the challenges of internal users who could employ newer and more cost effective computing and telecommunications technology. The benefits of a charge back system are that, first, it creates an understanding among line groups of the role they play in creating staff services and their need to fund them and, secondly, it encourages staff services to be more responsive to real business needs (Johnson and Loewe, 1987). The concept is similar to that of overhead value analysis discussed earlier.

Accounting policies can be made subservient to corporate strategies and are not independent of them (Hiromoto, 1988). Top executives must recognise that they have complete control over choosing their measurement and control systems (Kaplan, 1986). The current economics of information have made multiple cost systems possible (Kaplan, 1988) and there is no reason why three costing systems cannot run concurrently - one to provide feedback on product costs, one to guide employees to desired goals and one to fulfil the requirements of external reporting. Information

collection and feedback focuses on cost drivers and identifies areas where managers can reduce costs. The next section examines how costs and revenues can be extrapolated to enhance company performance.

2.3.5 Restructuring to optimise cost drivers

Having eliminated unproductive or non value adding costs the next step in leading a company to competitive advantage is to exploit its cost drivers. Each activity has cost drivers that can generate cost advantage and companies must either perform these activities at a lower cost or carry them out in such a way that a premium price can be charged out for differentiation (Porter and Millar, 1985). For example if economies of scale result in significantly reduced costs then in order to exploit this cost driver a high market share should be aggressively pursued (Ghemawat, 1985). Linkages create trade offs in performing different activities. With careful management they can be a powerful source of competitive advantage (Porter and Millar, 1985). Reducing costs by exploiting experience curves can be appropriate when a company's product is sensitive to price changes (Ghemawat, 1985).

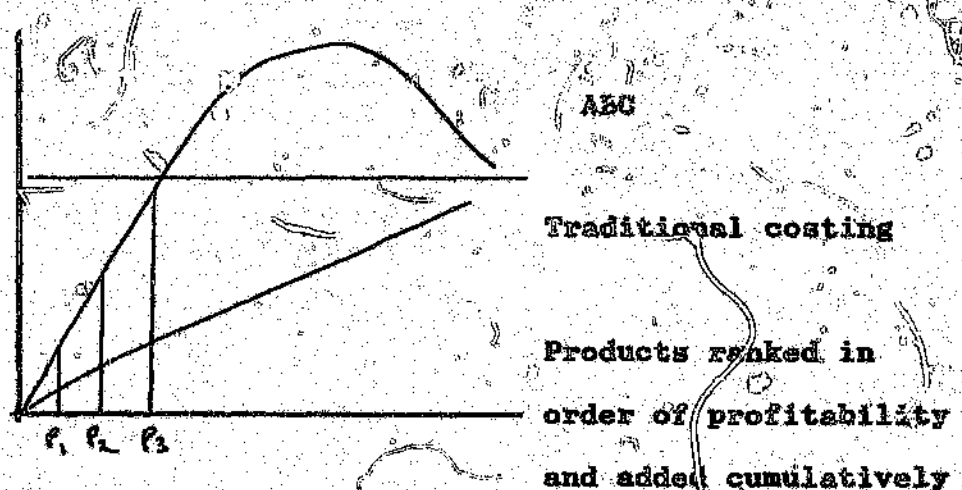
In addition to exploiting cost drivers, or on its own, focus can be a powerful strategy in improving profitability. In order to pursue a focus strategy one must segment the business into products, market areas, geographic locations and analyse the revenues generated, costs incurred and assets employed in order

to sustain a particular segment. It is not uncommon to find that some segments are unprofitable and, if so, there are three options available: firstly, improved efficiency and cost reduction; secondly, higher selling prices; and if neither of these are achieved and the segment remains unprofitable, the third solution is to divest the segment. Cooper and Kaplan (1988b), Schmenner (1988), and Campbell (1989) discuss the incidence where a multitude of special, peripheral products manufactured in small volumes are run in tandem with a few high volume items. They say that these small volume items create complexity and attract a high level of resource and therefore are costs which could be eliminated if the company focused exclusively on the few high volumes that made up its core business. O'Guin (1990, p39) demonstrates how expensive low volume parts can be when analysing component costs with ABC. Parts manufactured in their thousands on a screw machine were costed between \$0.11 and \$0.22 but increased to \$0.85 for 395 units, \$5.11 for 119 units and \$22.65 for 26 units. In restructuring their operations Xerox took steps to simplify their products, manufacturing process, and organisational structure. Suppliers were reduced, resulting in better cost prices and improved quality. Complex MRP systems became simpler as the number of parts decreased and the complexity of product structures and materials were reduced (Ernst, 1987). Thus the attendant overhead structure necessary to carry the complexity could be reduced. Schmenner (1988) recommends that only those products that make sense for the manufacturing process should be taken on and not just any product as they can cause a disproportionate increase in overheads. The

graph below illustrates the composition of product profitability.

FIGURE 8 PRODUCT PROFIT/VOLUME PROFILE (Johnson, 1988,p29)

Cumulative Profit



Tennican (1987) discusses a company which lost money in several business units (acquired to extend product lines and says that this finding led management to refocus growth into a narrower range of business in which they were already operating successfully. Finkin (1988a,p53) finds that "... when no single sale is critical to the business plan of the manufacturer, the risk of a minor potential reduction in sales... can be traded off to obtain a major reduction in sales expenses." Porter and Millar (1985) and Porter (1985) concur with this finding and support the supposition that targeting a particular market segment can result in achieving significantly lower costs. Sheridan (1989) cites a company that serviced four hundred customers of which fifty represented the bulk of turnover and profit. In his ABC analysis of a factory O'Guin (1990) identified a big improvement in profitability by eliminating low

volume product lines and their accompanying costs. Sales were reduced by 3% and profits increased from \$2 million p.a. to \$11 million p.a.

By deduction peripheral, or marginal sales, can generate a disproportionate cost level rendering those sales unprofitable. It is clear that cost functions are not always linear when a company diversifies into additional product lines or market segments but in fact can be curved as marginal costs exceed the marginal revenues when activities increase. The argument for more realistic costing systems is that management must understand and monitor the real cost functions of its organisation. The focus strategy concentrates on divesting a company of problem areas and concentrating on its strengths.

2.3.6 Summary

It is evident from the literature that there are two concepts of cost drivers. First, there are the ten types categorised by Porter (1985) which cover the basic operations, or methods, of conducting business and these are linked to market strategies. For example low cost, high volume sales requiring market dominance will exploit economies of scale and learning. Whereas low volume, high price sales lend themselves to a niche market and this type of strategy exploits cost drivers such as interrelationships, timing and location. The cost drivers cover every facet of a business from production throughput to the management of discretionary costs. Secondly, the literature

develops the concept of cost drivers as being those activities, and/or transactions, that drive costs. Readings such as Kaplan (1988), Cooper and Kaplan (1988), Drury (1989) and Millar and Vollman (1985) emphasise that overheads have greatly increased and trace the growth to increases in transactions and diverse activity. The main strategy that is recommended for this scenario is focus. If the high level of transactions continue in order to service a multitude of products the literature affirms that those products generating high overheads should be correctly costed and priced realistically to the market. ABC is superior to traditional costing in identifying which products, markets and customers attract and drive costs.

An underlying theme in the literature is cost minimisation. Whilst resources, and thus cost, are necessary to drive a business, effort and intelligence need to be expended in keeping them to a minimum. The money saved either adds on to the profit or allows a reduction in selling price. ABC, or cost driver analysis, presents a powerful analytical tool in assisting a company to achieve competitive advantage.

2.4 COMPARISONS AND CONTRASTS BETWEEN ZBB AND ABC

ZBB focuses on non volume related or discretionary expenditure and encourages the managers who prepare decision packages to first establish that their activity or cost centre is indeed necessary. If so then managers should prepare a minimum cost

package for the activity and justify the minimum, and each incremental, level of resource on a cost versus benefit basis. Innovation is called for in searching for alternative methods in carrying out the activity. Whilst ZBB is best carried out with the strategic aims of the company as a guideline (Cheek, 1977) the decision packages are discreet exercises, each one examining its own particular cost centre. These are coordinated at evaluation and ranking reviews. A better allocation of resources is the main benefit derived from ZBB (Austin and Cheek, 1977; Dean and Cowen, 1979a) and all the literature surveyed agrees that it assists in cost reduction by identifying non value adding expenses. Strategic issues such as customers or products to pursue or divest are not examined in ZBB. It appears to concentrate on how to achieve the outputs of non volume related activities in the most cost effective manner and appears best suited to a company with a large overhead structure. Whilst discretionary costs are easier to reduce than production or sales related expenses the literature says that it is these costs that have a leverage effect or outputs greater than the input cost and therefore arbitrary expense reductions can have adverse effects on financial performance. ZBB is a superior method to objectively reduce the overheads without adversely affecting the outputs generated by them.

Cost driver analysis or ABC provides a tool in assisting management with decision making with respect to the retention, divestment, expansion or contraction of products, customers, geographic areas and markets. It accepts that expenses are

necessary and traces the activities that cause these expenses with a view to establishing the trade off between expenses incurred and revenue generated. Whilst cost reduction is an aspect covered in the analysis of cost drivers (per para 2.3.4) the main purpose of cost driver analysis or ABC is to assist management in making strategic decisions that will enhance performance not necessarily by a reduction in expenses but by realigning resources within the company. Wastage is not condoned by this methodology.

ZBB is an extension of normal budgeting procedure and is normally an annual event whereas ABC provides an ongoing feedback of information. However an ad hoc analysis using ABC may help considerably in focusing strategic options for a company. Case study 1 on the computer company is an example.

Both ZBB and ABC facilitate cost control but they are discrete methodologies that have little common ground. ZBB is an objective resource allocation and cost reduction methodology with minimal attention to company strategy. Cost driver analysis, or ABC, firstly assists strategic cost/revenue control in a company and secondly, and less significantly, acts as a facility to promote cost reductions. Most of the literature for ZBB is found in the early 1970s but there is little currently available whereas ABC, which has become popular from 1985 onwards, is a topical subject. It appears that interest was lost in ZBB whereas the strategic benefits of ABC are most suitable for today's complex manufacturing and trading environment and hence its popularity.

3. RESEARCH METHODOLOGY

Leedy (1989,p89) outlines four methods of research to examine a hypothesis. These are the historical method, the analytical survey method, the experimental method and the descriptive survey method. This last method can be achieved by the use of questionnaires and statistical treatment, or by case study research.

Bailey (1987,p298) says that "...the case study approach allows the researcher to select examples that illustrate the point he or she wishes to make." Leedy (1989,p141) says a case study "...lies midway between the descriptive survey method and the experimental method" and that the researchers "...observe with close scrutiny the population bounded by the research parameters...(and make) a careful record of what they observe so that when the aggregate record is made, the researchers can return to the record to study the observations that have been described there."

A questionnaire examines the respondents perceptions about a subject and there is little possibility that the respondent will have an in depth knowledge of either ZBB or ABC with the result that conclusions arrived at from the questionnaire could be misleading. Therefore case study was chosen as the research method.

Two companies were selected and ZBB and ABC were applied to their

cost structures with a view to examining the effectiveness of these techniques in promoting cost control and enhancing financial performance.

The first case study examines a trading company in the computer industry where ZBB and ABC are applied to the overhead structure and the methods are compared and contrasted. The second case study examines a manufacturing company in the packaging industry which prepared a scratch budget to analyse how divesting a certain product range, and eliminating wastage, could enhance profitability.

4. CASE STUDY 1 - COMPANY XYZ IN THE COMPUTER INDUSTRY

4.1 Introduction

Company XYZ is a division of a leading computer company in South Africa. The division was originally an independent company selling personal computers (PCs) to dealers and the general public. The holding company acquired it to gain entry to the PC market and then included computers with Unix software in the division. Unix is an operating software system that allows for multi user access to a computer whereas personal computers use a DOS operating system which caters only for single users. Unix software can be used on the hardware of different computer companies. The selling price of a PC ranges from R3,500 to R15,000 whereas a Unix system retails upward from R25,000 to R1,000,000. The holding company specializes in large proprietary mainframe computers which are retailed to insurance companies, banks, and government departments. This is perceived to be a dying business by the holding company and because of this it is developing the lower end of the computer market. The holding company has business divisions which focus on different market sectors, whilst services such as procurement, inventory, finance, information technology and marketing are centralised and the resources are drawn on by all divisions. The inventory and accounting system employed by the Head Office is geared to a low level of mainframe sales with a high level of support and is not suitable for the high volume of PC and Unix sales in company XYZ. Further a quick turnaround on orders is necessary to satisfy PC

customers which the Head Office system cannot provide. Thus XYZ has its own computer system and store and a finance division to keep records of the decentralized function.

Presently the PC market, particularly, and the Unix market are overtraded making price competition intense. Further PC cost prices are and have been declining and product life cycles have shortened increasing the risk of stock obsolescence. Thus strategic analysis, careful stock purchasing, cost control and an understanding of product costs are all necessary for survival in this sector.

XYZ had just completed its budget cycle at the time of this case study and from this data and other transactions extracted an activity analysis was carried out to establish which costs were driven by PCs and which were driven by Unix. This is of major interest as the margins on PCs are low and if they should attract a disproportionate share of overhead costs then pricing/cost strategies need to be re-assessed. The allocation of costs to the PCs for the finance division was calculated to be 87% of the total whereas PCs account for 49% of sales. Because of this the department was selected to carry out a zero base budget to establish which costs were critical to the operation.

4.2 Application of ABC and ZBB and summary of results

4.2.1 Activity based cost analysis

4.2.1.1 Figure 9

The sales budget was prepared by quantity, cost price and selling price to arrive at gross profits for the different product ranges. Quantities include accessories that are sold with computers such as monitors, printers, upgrades, hard disks, cables etc. In Figure 9 the various products are summarised into two categories being Unix and PCs. Also itemised in Figure 9 are the number of customers, invoices, purchase orders and goods received vouchers relevant to the two product groups. These were abstracted from the previous year and applied to the budget. This transactional data forms the basis on which activity costing was carried out.

4.2.1.2 Figure 10

Figure 10 sets out cost elements by department as prepared by the budget. Cape Town and Durban expenses include branch charges for handling costs and transport costs as well as selling expenses.

4.2.1.3 Figure 11

Costs were then allocated as far as possible to activities and these are detailed in Figure 11. Overhead costs were allocated directly to each activity where possible. Where it was not possible to directly allocate overheads, such as telephones and rentals, these were allocated as indicated in Figure 11.

FIGURE 9 (Case study 1) BREAKDOWN OF SALES BY PRODUCT, QTY, VALUE AND MARGIN					Transactional details				
	TRANSVAAL	CAPE TOWN	NATAL	TOTAL	CUSTOMERS	INVOICES	PURCHASE ORDERS	GRV'S	TOTAL NO. OF DOCS.
UNIX - UNITS	728	48	48	824	10	439	165	235	839
SALES R'000	11,887	926	840	13,653					
MARGIN R'000	3,591	279	254	4,124					
	30.2%	30.2%	30.2%	30.2%					
PCs - UNITS	2,189	1,377	444	4,010	70	1,093	1,740	2,670	5,503
SALES R'000	7,584	4,015	1,336	12,935					
MARGIN R'000	1,480	731	264	2,475					
MARGIN/SALES	19.5%	18.2%	19.8%	19.1%					
TOTAL - UNITS - EACH	2,917	1,425	492	4,834	80	1,532	1,905	2,905	6,342
SALES R'000	19,471	4,941	2,176	26,588					
MARGIN R'000	5,071	1,011	518	6,599					
MARGIN/SALES	26.0%	20.5%	23.8%	24.8%					

FIGURE 10 (Case study 1)		EXPENSE BUDGET R'000						
	TOTAL	FINANCE	INV	MARKT	MANGM	SALES	C.T.	DBN
SALARIES	1,148							
COMPANY PENSION	90							
TRAVEL ALLOWANCE	294							
MEDICAL AID	63							
	1,595	382	100	51	246	546	157	113
BONUS	375	44	7	4	73	197	35	15
TRAVEL & ENTERTAINMENT	105				8	73	12	12
TRAINING	26					20		6
LOAN & DEMO STOCK	34					34		
COMPUTER RELATED	28	28						
ADVERTISING	72					55	10	7
LABOUR - RECRUITMENT	46					46		
INSURANCE	27	12	15					
TELEPHONES	95	21	5	2	10	22	17	18
PRINT & STATIONERY	14	12		2				
NETWORK FEE	49	49						
RENTS	231	52	24	10	15	130		
TRANSPORT	200						140	60
INTERCOMPANY CHARGES	78						51	27
	2,975	600	151	69	352	1,123	422	258

FIGURE 11 (Case study 1) GROUPING OF EXPENSES INTO ACTIVITIES - R'000

FINANCE		TOTAL (5)	FIN MAN & ACCNT (2)	DEBT CLK & 50% SUPV (1,5)	STR CLK & 50% SUPV (1,5)	COMPUTER	BASIS OF ALLOCATION
SALARIES & RELATED	426	189	125	112			DIRECT
TELEPHONES	21	8	7	6			PEOPLE(5)
RENTS	52	21	16	15			PEOPLE(5)
INSURANCE - COMP	12					12	DIRECT
PRINT & STATIONERY	12		4	4		4	ESTIMATE
NETWORKING	49					49	DIRECT
COMPUTER RELATED	28					28	DIRECT
	600	218	152	137		93	
COST DRIVER		Unix - 13% Customers PCs 87% - Unix - PC's		Number of documents	Number of docs and stk qty		
INVENTORY		151					
COST DRIVER		STK QTY					
MARKETING		69					
COST DRIVER		PRICE LIST QTY					
MANAGEMENT		352					
COST DRIVER		Unix - 50% PCs - 50%					
SALES		TOTAL (5)	MANAGER (1)	UNIX SALESMEN (2)	PC SALESMEN (2)		
SALARIES & RELATED	546	137	217	192			DIRECT
BONUS	197	70	77	50			DIRECT
TRAVEL	12	4	4	4			DIRECT
ENTERTAINMENT	61	5	28	28			PEOPLE(4)
TRAINING	20		20				DIRECT
ADVERTISING	55		27	28			50% UNIX & 50% PCs
RECRUITMENT	46		23	23			PEOPLE(4)
TELEPHONE	22	4	9	9			PEOPLE(5)
LOAN & DEMO STOCK	34		25	9			DIRECT
RENT	130	26	52	52			PEOPLE(5)
	1,123	246	482	395			
COST DRIVER		50% Unix 50% PCs					
BRANCHES		SALES		LOGISTICS			
CAPE TOWN		231		191			
DURBAN		171		87			
		402		278			
COST DRIVER		Sales Value		Stock Quantity			

Cost drivers for each activity were identified as follows:

(i) Finance division

- In order to run a department for Unix and PCs both a financial manager and a bookkeeper are necessary. However if Unix was the sole product range only the bookkeeper would be necessary due to the low volume of transactions, reduced debtors and minimal stock holding. Accordingly the cost of the Financial Manager should be regarded as relating to PCs only whereas the bookkeeper's costs could be split between the two product groups. The percentage split is therefore calculated:

	<u>Unix</u>	<u>PCs</u>
Financial Manager		R181,000
Bookkeeper	<u>R28,500</u>	<u>R28,500</u>
	R28,500	R189,500
% to total	13%	87%

- Debtors control costs are driven by the number of debtors relating to each product group.

- Stock control activity is driven by the number of documents generated in order to bring goods into, and despatch goods from, stock.

- Computer costs are driven by records held which include stock and debtors, and transactions created which include invoices, purchase orders, GRVs etc.

(ii) Inventory

The cost driver selected to allocate inventory costs are the number of stock units. Alternative drivers could be floor space or volume utilised, or the number of GRVs and invoices. Each stock item needs to be physically handled and recorded whereas invoices, for example, can include several stock items. Stock quantity is therefore regarded as the major determinant of all costs.

(iii) Marketing

Marketing costs in the division include one person who spends most of her time updating and changing price lists. Accordingly the number of items in the price list is the cost driver.

(iv) Management

Time spent by the general manager is the major cost driver. The general manager estimated that his time is split evenly between the two product groups. It is felt that a more detailed examination of what was actually done by the general manager i.e. problem solving, customer liaison etc. might have given a more accurate estimate of actual cost drivers, but it was not possible to obtain this information.

(v) Sales division

The sales division comprises a sales manager and two teams of salesmen, one for each product group. Selling division costs for

each product group are accounted for separately, as far as possible. The sales manager's costs were deemed to be driven by the number of salesmen in each product category. Again, a more detailed analysis of actual time spent by the sales manager may have revealed different cost drivers such as the number of client visits, incidence of problem solving, time spent managing the sales staff for the two product groups etc.

(vi) Branches

Cost allocations for Finance, Inventory, Marketing and Management are based on the total company transactions and therefore the allocation to Unix and PCs will include those sold at the branches. Therefore it is only necessary to determine how branch costs be apportioned between Unix and PCs. Intercompany charges cover logistics handling and transport covers the cost of getting the goods from Johannesburg to the branches. The cost driver for these are deemed to be the number of stock items. All other expenses are sales related. Sales value is deemed to be the cost driver and selling time is deemed to be proportional to value rather than units. Again a more detailed analysis of actual time spent by the sales branch managers may have revealed different cost drivers.

4.2.1.4 Figure 12

The costs and allocations from Figure 11 are summarized on Figure 12. In addition to running costs stock and debtors holdings are included. The basis for allocating these to Unix and PCs are set

FIGURE 12 (Case Study 1)		BASIS OF COST ALLOCATION		R'000		
		UNIX	PCs	TOTAL		
FINANCE						
Fin Man & Account	- 138 Unix - 878 PCs	28	190	218		
Credit Control	- 10 Unix Customers - 70 PC Customers	19	133	152		
Stk Admin	- 839 Documents - Unix - 5503 Documents - PCs	18	119	137		
Computer	- 1673 Units/Customers/Documents - Unix - 9583 Units/Customers/Documents - PCs	14	79	93		
Total - Finance		79	521	600		
INVENTORY						
	- 824 units sold - Unix - 4010 units sold - PCs	26	125	151		
MARKETING						
	- 149 units on price list - Unix - 295 units on price list - PCs	23	46	69		
MANAGEMENT						
		176	176	352		
SALES						
Salesmen	- direct allocation	482	395	877		
Sales Manager	- 508 Unix - 508 PCs	123	123	246		
Total - Sales		605	518	1,123		
BRANCHES						
Sales expenses	- R1,766,000 sales of Unix - R5,351,000 sales of PCs	100	302	402		
Logistics	- 96 units sold of Unix - 1821 units sold of PCs	14	264	278		
Total - Branches		114	566	680		
TOTAL ALL EXPENSES		1,023	1,952	2,975		
STOCK HOLDING 2500 : Estimated breakdown Interest at 20%		260 52	2,230 448			
DEBTS HOLDING 2880 : Estimated breakdown Interest at 20%		1,480 296	1,400 280			
CREDITORS		NIL	NIL			

out below:

(i) Stock

Unix - Unix stock is not held. Purchase decisions are long term. Customers therefore accept delays in supply. XYZ place an order on Taiwan or the USA for a Unix box only once they receive an order from the customer. Payment terms to the supplier are by letter of credit, 30 days after being raised. Receipt of stock and delivery to customer occurs approximately 40 days after receiving the order. The effective stock holding is therefore 10 days or R260,000 based on the cost of sales for Unix.

PCs - Two and a half months, or R2,240,000, represents normal stock holding for PCs. The stock level is high as a variety of configurations and accessories are held to service a wide customer base.

(ii) Debtors

Months holding averages 1.3 months of sales and this factor has been applied to Unix and PC sales to arrive at a value.

4.2.1.5 Figure 13

Figure 13 analyses product profitability first, on a marginal basis, and then on an absorption basis. In both instances Unix profitability is better than PCs but the 7.9% profit to sales for

FIGURE 1 (Case Study 1) PROFIT ANALYSIS USING DIFFERENT SYSTEMS R'000

MARGINAL COST ANALYSIS

	Unix	PCs	TOTAL
Sales	13,653	12,935	26,588
Cost/Sales	9,529	10,460	19,989
Contribution	4,124	2,475	6,599
Contr to sales	30.28	19.14	24.84
Overheads			2,975
Profit			3,624

ABSORPTION COST ANALYSIS

	Unix	PCs	TOTAL
Sales	13,653	12,935	26,588
Cost/Sales	9,529	10,460	19,989
Contribution	4,124	2,475	6,599
Overheads	1,828	1,447	2,975 (Split on Sales)
Profit	2,596	1,028	3,624
Profit/Sales %	19.04	7.98	13.64

ACTIVITY BASE COST ANALYSIS

	Unix	PCs	TOTAL
Sales	13,653	12,935	26,588
Cost/Sales	9,529	10,460	19,989
Contribution	4,124	2,475	6,599
Overheads	1,023	1,952	2,975
Profit	3,101	523	3,624
Profit/Sales %	22.78	4.04	13.64
Interest on stock	52	448	500
Interest on debt.	296	280	576
Profit/Sales %	2,753	(205)	2,548
	20.20	-1.64	9.58
OR Profit	3,101	523	3,624
Assets : Stock	260	2,240	2,500
Debts	1,480	1,400	2,880
	1,740	3,640	5,380
Profit/Assets	178.20	14.40	67.40

PCs (in the absorption analysis) indicates that product profitability is acceptable. Costs allocated on an ABC basis reduce PC profitability further and reduces the line to a loss situation once the costs of holding assets are deducted.

4.2.1.6 Discussion

Excluded from the analysis are obsolescence costs and these pertain to PCs only where stocks are held. Thus the ABC analysis identifies PCs as a line where profitability needs to be improved either by cost reduction or improved selling prices. Failing this the line needs to be divested. A number of PC businesses have gone bankrupt and the above analysis indicates that the low profit margin and high stock holding have precipitated adverse cash flows. An additional factor has been a rapidly changing technology and falling prices which has created high obsolescence for the industry. The holding company forces XYZ to under supply PCs which make market dominance difficult but does ensure low obsolescence and thus solvency.

If the profit under ABC is taken as a percentage of assets employed the return on PCs of 14.4% (before tax) is marginal, by the standards of the holding company, but the return on Unix boxes is much more attractive. Whilst any costing system indicates that Unix boxes are more profitable than PCs an ABC analysis indicates the difference is more extreme and that the financial viability of PCs is questionable. Theoretically costs will increase and decrease in accordance with stock volumes and

associated transactions. In practice fluctuations from month to month will leave costs unchanged. Permanent increases or decreases in sales volumes will cause a corresponding change in cost, although the changes will be stepped.

4.2.2 Zero-base budget for Finance division

Decision packages were prepared on the Basis as set out in Austin and Cheek (1979) pp17-20.

4.2.2.1 Figure 14

Level 1 in Figure 14 sets out the minimum cost required to provide a financial service to XYZ.

4.2.2.2 Figure 15

Level 1A (per Figure 15) provides an alternative to Level 1 in providing a financial service by removing an in house LAN and passing the accounting and computing function to Head Office.

4.2.2.3 Figure 16

Level 2/3 in Figure 16 examines the benefits from employing a senior business controller. The improvement in asset management and in credit control is estimated to generate an additional R345,000 of income to the division. The holding company is demanding a headcount reduction in the financial division and has

DECISION UNIT : FINANCE

LEVEL 1/3

DESIRED RESULT

To provide financial and management accounting services to XYZ

RESOURCES REQUIRED	THIS LEVEL	ACCOM. LEVEL
PERSONNEL	3	3
Salary	146444	146444
Bonus	19070	19070
Premises	31200	31200
Telephone	11600	11600
Comp - DPE	28000	28000
- Ins	12000	12000
- Pr & St	12000	12000
- Network	49000	49000
H.O. Accounts	36000	36000
GRANDS P.A.	345314	345314

DESCRIPTION OF ACTIVITY:

To collect debts, to control stocks - receipt purchases in, generate purchases orders and expedite; to keep books of accounts, safeguard assets and prepare monthly income statements

HOW AND WHEN ACCOMPLISHED:

1 person maintains debtors ledger, collects cash, arranges cash payments and maintains creditors ledger

1 person controls computer input of complete stock cycle - purchase orders, receipt, sales orders, invoices and expedites purchase orders

1 person reconciles bal. sheet accounts, arranges input for general ledger, prepares detailed sales analysis and income statement. Computer facilitates sales analysis, etc.

H.O. prepares budgets and conducts reviews and strategic analysis

ALTERNATIVE WAYS

Let holding company administer the accounts. Level 1A describes in detail. The expenses of level 1A are less than level 1 which describes an independent accounting system.

BENEFITS OF RETAINING THE ACTIVITY

The additional cost of an independent accounting system is R89000 (ie R345314-R256314). Margins on the budgeted mix are 25% and therefore an additional R356000 sales are required to justify the focussed accounting, the additional cost being a LAN and software fees.

Benefits are:

1. Independent accounting
 - clear communication between accounting and management/sales
 - unambiguous feedback of data by accounting to management and sales personnel
2. LAN
 - sales, margins, stock on hand, sales orders outstanding available on line
 - impact software more flexible in data dissemination (e.g. report writer, dumps to Lotus 123/Dbase 3+) than old mainframe system used by H.O.

A quick response to dealers is important to XYZ. The accounting and stock system of the H.O. would find it difficult, if not impossible, to achieve this without additional resource.

It is expected that the focussed accounting division will generate more than the additional R356000 sales required.

CONSEQUENCES IF ACTIVITY IS ELIMINATED

Accounting records are mandatory for legal purposes and the loss of revenue in terms of unbilled deliveries, stock losses, poor credit screening, etc, would exceed the cost of the department.

FIGURE 15 (Case Study 1)

DIVISION : XYZ

LEVEL 1A/3

DECISION UNIT : FINANCE

LEVEL 1A/3

DESIRED RESULT

To provided financial and management accounting services to XYZ

RESOURCES REQUIRED

THIS LEVEL

ACCUM. LEVEL

PERSONNEL

3

Salary

146444

Bonus

19070

Premises

31200

Telephone

11600

Comp - DPE

- Ins

- Pr & St

- Netwk

12000

H.O. Accounts

36000

RANDS P.A.

256314

DESCRIPTION OF ACTIVITY

As for level 1/3. Given sales mix and volumes then stock recording, debt collecting and bookkeeping activities are necessary.

HOW AND WHEN ACCOMPLISHED

As for level 1/3. Two persons are definitely needed. The third person may not be focussed on all the activities per 1/3 as the work would be spread among differnt people at head office. Theoretically an extra head would be needed at H.O. to handle the load. If there is slack then the extra person may not be necessary.

ALTERNATIVE WAYS

Not applicable

BENEFITS OF ALTERNATIVE

- saving of LAN cost R89000
- as H.O. has a greater number of people there is scope for rationalization whereas there is no scope for an independent system. However personnel are considered necessary as transactions generated by activity are the same irrespective of whether the administration is handled on the H.O. mainframe system or an independent LAN.

CONSEQUENCES IF ACTIVITY IS ELIMINATED

As for level 1A/3

FIGURE 16 (Case Study 1)		DIVISION :XYZ		LEVEL 2/3	
DECISION UNIT : FINANCE		LEVEL 2/3			
DESIRED RESULT To reduce the level of working capital and improve customer service.	RESOURCES REQUIRED		THIS LEVEL	ACCUM. LEVEL	
	PERSONNEL		1	4	
	Salary		99700	246144	
	Bonus		14660	33730	
	Premises		10400	41600	
	Telephone		4700	16300	
	Comp - DPE			28000	
	- Ins			12000	
	- Pr & St			12000	
	- Netwk			49000	
H.O. Accounts			36000		
RANDS P.A.		129460	474774		
DESCRIPTION OF ACTIVITY To supervise and assist in the collection of debts in order to reduce outstandings. To supervise stock in order that month holdings are reduced and that stock outs are reduced					
HOW AND WHEN ACCOMPLISHED Employment of business controller who will * Liaise with customers, revamping credit limits, aggressive collections, stop shipments of delinquent payers * categorise stock into 'A', 'B' and 'C' lines. Detailed planning planning on 'A' and then onto 'B' and 'C' lines.					
BENEFITS OF THIS LEVEL Debtors of 1,3 months or R2880K is the norm Stock of 1,5 months or R2493K is the norm Benefits are estimated					
		Probability	Benefit R'000		
1.	Debtors holdings reduced to 1,0 months R2235K Interest saving : R645K * .2 (interest) = R129,000	0.75	97		
2.	Stockholding reduced to R1680K or 1.0 months Interest saving : R813K * .2 (interest) = R163,000	0.6	98		
3.	Reduction of stockouts generating an additional R1329K sales - Margin: R1,329K * 25% = R332,000	0.6	199		
4.	Improved credit control saving R200,000	0.4	80		
TOTAL BENEFIT			474		
COST			-129		
NET BENEFIT			345		
ALTERNATIVE WAYS Let H.O. fulfil this function. Rejected as personnel, at this level, are already overstretched.					
CONSEQUENCES IF ACTIVITY IS ELIMINATED Loss of incremental income					

selected the business controller as a candidate for redundancy. The job is perceived by H.O. to be non-essential but this decision package demonstrates the benefit of the job function.

4.2.2.4 Figure 17

Level 3/3 in Figure 17 studies the advantages of employing a financial manager. Benefits are not quantified but it indicates that the activities carried out by the person should exceed the cost of employing him.

4.2.2.5 Discussion

It is apparent that the employment of additional resources would contribute little or no benefits on existing sales and a "level 4" would bear this out. In fact the department has reduced from seven to five persons over the last eight months with no change in sales volumes and there have not been adverse effects. Level 1 of the decision package correctly says that a financial service is necessary to avoid stock losses and it would be difficult to refute this logic. On a material cost of R15 million for the year only 2% of stock not invoiced or pilfered would make up R345,000 that being the minimum cost of the department. However the package does not indicate which costs are necessary. For example printing and stationery may only require R6,000 as compared to the R12,000 budgeted. This analysis makes it difficult to identify padding. Even if the current levels of expenditure are reflected and reductions are shown in the

FIGURE 17 (Case Study 1)		DIVISION : XY Z		LEVEL 3/3	
DECISION UNIT : FINANCE		LEVEL 3/3			
DESIRED RESULT To provide an in depth financial analysis and management to the division.	RESOURCES REQUIRED		THIS LEVEL	ACCUM. LEVEL	
	PERSONNEL		1	4	
	Salary		135856	382000	
	Bonus		10270	44000	
	Premises		10400	52000	
	Telephone		4700	21000	
	Comp - DPE			20000	
	- Ins			12000	
	- Pr & St			12000	
	- Netwk			49000	
H.O. Accounts*		(36000)			
RANDS P.A.		125226	600000		
*The Head Office accounting function will be discontinued as their functions will be carried out by the financial manager.					
DESCRIPTION OF ACTIVITY To coordinate the department and streamline systems To liaise with general manager, particularly on constant review of an economics of business, part of which is to analyse the division on activity basis.					
HOW AND WHEN ACCOMPLISHED Employment of Financial Manager to carry out the functions specified below.					
BENEFITS OF THIS LEVEL - assist General Manager (who is sales oriented) in formulating strategy - which markets to penetrate and which to divest - which customers to pursue - which products to develop and which to divest - providing sales with relevant sales/profit information - liaison with H.O. to secure the required resources to run the business e.g. additional borrowings to fund working capital for sales increases as necessary : additional central marketing support - Analysis of activities - products and customers - that generate cost so that cost relationships are adequately understood when restructures are made. It is considered that this type of ongoing conceptual input will generate more than R125R revenue. Examples are - elimination of small customers whose cost of servicing exceed the profit they contribute. - increase volumes of printer/sundries which generate profit for sales requiring no stockholdings as they are buyouts. It is unlikely that other staff members would conceptualise the above strategies. The benefits are long term. No immediate benefit is likely to be gained in the short term (i.e. up to 6 months)					
ALTERNATIVE WAYS - Let H.O. fulfil the function - rejected as personnel, if part time will not give the necessary time to achieve the requirement. - employ consultants periodically. Rejected as their learning curve for the industry makes their exercise too lengthy and thus too expensive.					
CONSEQUENCES IF ACTIVITY IS ELIMINATED Loss of incremental income					

decision package there is no guarantee that additional inefficiencies do not exist. The integrity of the person preparing the decision package is necessary to the success of this exercise.

Whilst the package is an advance on normal budgeting and considers the value of different levels of resource employment it does not take cognisance of how transactions drive the department or how the department would be affected by a change in product mix or customer mix. This type of decision package is representative of that surveyed and discussed in the literature and it prompts thought as to benefits gained by the resources employed and considers alternatives. It has served to promote cost reduction and innovative thinking with respect to alternative methods without considering the overall cost structure, cost interrelationships or strategies of the whole company.

However if an overall strategy was set to consider selling only Unix then a decision package for finance based on this assumption would bring to light that costs would reduce materially. The decision package as set out in Figure 18 reflects expenses of R118,210. Assuming that the R600,000 in Figure 17 is valid then the decision package for Unix implies that PC costs are R600,000 - R118,210. The split of costs can be compared below.

FIGURE 16 (Case Study 1)		DIVISION :XYE		UNIX SALES ONLY	
DECISION UNIT : FINANCE					
DESIRED RESULT To provide a financial service to the Unix division		RESOURCES REQUIRED		(R)	
		Salary		1,4	68340
		Bonus			8900
		Premises			14560
		Telephone			5410
		HO Accounts			15000
		Computer			6000
		RANDS P.A.		----- 118210	
DESCRIPTION OF ACTIVITY To provide the necessary accounting service to stocking and selling of Unix boxes and to analyse profitability.					
HOW AND WHEN ACCOMPLISHED 33% of a clerks time to process stock transactions and expedite deliveries 10% of a clerks time to collect debts. 1 person to provide management accounting services. Head Office supervision Allocation of computer time					
BENEFITS OF THIS LEVEL 1. Level of accounting services for Unix alone are considerably less than for PCs and is most efficiently handled by farming out to H.O. personnel 2. It is considered that a focused analysis of Unix performance is necessary in order to be competitive in setting strategy.					
ALTERNATIVE WAYS Not applicable					
CONSEQUENCES IF ACTIVITY IS ELIMINATED Loss of revenue without accounting services and loss of competitive advantage by not understanding cost structures and relationships					

	ZBB		ABC	
	<u>Decision package</u>		<u>Decision package</u>	
	(R)	%	(R)	%
Unix	118,210	20	79,000	13
PCs	<u>481,790</u>	<u>80</u>	<u>521,000</u>	<u>87</u>
	<u>600,000</u>	<u>100</u>	<u>600,000</u>	<u>100</u>

If Unix was divested it is considered a decision package would find little scope to remove any of the expenses in Figure 16 (or the decision package for level 2/3). Only ten customers are divested, out of eighty, stock holding is not significantly reduced and stock movements do not decrease materially. However as there is no product mix, and there are less strategy implications, a financial manager is not required. The incremental cost of R125,226 in Figure 17 (per decision package for 3/3) is therefore not necessary and the split of costs for Unix and PCs in this instance is:

	ZBB	
	<u>Decision package</u>	
	(R)	%
Unix	125,226	21
PCs	<u>474,774</u>	<u>79</u>
	<u>600,000</u>	<u>100</u>

This reasoning indicates that a zero base assessment can reflect how costs in finance move in relation to the different product

groups. However the normal method of preparing decision packages is an exercise in cost control that is not related to ABC. Further only two products are considered in this exercise. The preparation of alternative decision packages on variants for, say, eight different product groups would probably be too large a task for an organisation with normal staffing levels.

4.3 Discussion and conclusions

The ABC analysis has identified PCs as driving costs in a proportion higher than the sales value for PCs to total sales value; and correspondingly has identified Unix as driving less costs in relation to its sales value. The perception of XYZ's management is that overhead costs are fixed and that profitability can be enhanced by increasing the volume of sales. Profitability can only be improved for PCs by reducing costs, improving asset management and increasing selling prices. To promote an increase in sales for PCs by reducing selling prices will impact adversely on profitability whereas the trade off between price decreases and volume increases could be favourable for Unix, depending on the elasticity of demand for the product. ABC analysis has provided a superior understanding of XYZ's profit and cost structure over that provided by marginal and absorption costing. By identifying transactions ABC has located an area where costs can be reduced. XYZ is presently reducing debtors from eighty to thirty with minimal sacrifice in sales in order that the debtors function can be passed up to Head Office and carried by them without employing an additional person. It

is difficult to reduce the parts with respect to PCs and thus the paperwork generated. Short of a further advance in PC technology, resulting in the reduction of accessories, little can be done in this area to reduce costs.

The zero base budget for the finance department has confirmed the necessity for financial control and that a decentralised accounting function is preferable to a Head Office function. It has demonstrated that a business controller can generate net income by improving asset management and that a financial manager can generate strategic benefits. It is considered that additional persons could not be justified by ZBB in the finance department and therefore is a method that curtails employing unnecessary resources. It has also been demonstrated that ZBB can be used to determine costs for changes in product mix. In this exercise the outcome for costs in the finance division is similar to that arrived at in using ABC.

Other than this similarity ZBB and ABC are discreet methodologies. ZBB focuses on detailed cost control and considers alternative ways in providing a financial service to XYZ. The effect of transactions in driving the department is not considered, except where a Unix only option was examined. ABC accepts costs as they are and examines the transactions that cause them. Its contribution to cost control lies in identifying that PC profitability is poor. Strategies need to be carried out to rectify the situation be it cost reduction or improved selling.

prices in order to make expenditure for PCs a value adding activity.

Both methods have demonstrated their ability to control costs and enhance financial performance.

5. CASE STUDY 2 / COMPANY PKG IN THE PACKAGING INDUSTRY

5.1 Introduction

Company PKG in the packaging industry experienced falling profits and one avenue explored in reversing this trend was to prepare a zero base budget to determine how profitability could be improved by pursuing a focus strategy and eliminating wastage. PKG manufactures boxes for a variety of customers. There are two main product types being heavy duty lines and light duty lines and the manufacturing process is discrete for each of the two lines. Customers for heavy duty lines draw off high volumes for any one purchase and there are 102 customers for an output of 79,900 ton p.a. In addition box designs and printing on the exterior are standard for heavy duty lines. Customers for light duty lines draw off low volumes for any one purchase and there are 198 customers for an output of 6,900 tons p.a. Design and exterior printing are non standard for light duty lines. Figure 19 sets out the frequency and volume of sales for heavy and light duty lines.

ZBB focuses on discretionary costs or non manufacturing costs and justifies the expenses employed by preparing decision packages and ranking and approving them. Manufacturing expenses are normally excluded as alternative benchmarks, such as bills of material, are available to measure the efficiency of resource employment. In this budget all expenses were covered as the company was examining an alternative strategy for which no

FIGURE 19 (Case study 2) ANALYSIS OF TONS SOLD BY CUSTOMER AND BATCH SIZE SOLD

	TONS SOLD PER ANNUM					
	TOTAL	1-25	26-50	51-100	100-500	500+
CUSTOMERS DIVESTED - light duty lines	198 100.0%	117 59.1%	49 24.7%	21 10.6%	11 5.6%	0
CUSTOMERS RETAINED - heavy duty lines	102 100.0%	10 9.8%	7 6.9%	13 12.7%	30 29.4%	42 41.2%

FIGURE 20 (Case study 2) PROFIT STRUCTURE AND COMPARISON BEFORE AND AFTER RESTRUCTURE

		FORECAST	PER SCRATCH BUDGET	DIFFERENCE
R'000		1990	1990	
TONS		86,826	79,924	(6,902)
SALES		225,212	205,824	(19,388)
COST OF SALES	Raw materials	136,802	121,702	
	Distribution	8,044	7,180	
	Power and water	2,094	1,920	
	Settlement discount	2,778	2,626	
	Waste recoveries	(2,190)	(1,810)	
		147,528	131,618	
CONTRIBUTION		77,684	74,206	(3,478)
to sales		34.5%	36.1%	
FACTORY	Salaries and wages	24,526	17,428	7,098
	Maintenance	11,502	7,254	4,248
	Depreciation	5,656	4,554	1,102
	Rent and property	3,920	2,904	1,016
	Insurance	1,810	1,936	(126)
	Factory handling	2,382	1,460	922
	Other factory costs	6,298	4,958	1,340
		56,094	40,504	15,590
SELLING & ADMIN	Internal distribution	2,120	1,402	638
	Selling	5,024	2,784	2,240
	Finance/Admin	8,640	8,540	100
	Central charges	3,636	3,120	516
		19,420	15,926	3,494
OPERATING PROFIT		2,170	17,776	15,606

benchmark or standard was available.

The strategy selected for the budget was to exclude light duty lines from the business. Decision packages were not employed and a ranking, evaluation and selection procedure was not conducted. However the purpose in the budget exercise was not to examine the leverage effect of discretionary expenditure but to determine the minimum resource necessary to sell and manufacture heavy duty lines. A better term for the exercise would be a scratch budget. History and the existing budget were ignored when determining costs for the scratch budget. The outcome of the exercise was that the forecasted profit for the year of R2,170,000, or 1,0% of sales, was budgeted to increase to R17,776,000 or 8,6% of sales.

The case study examines the budget process and the outcome of the results. The cost drivers behind the heavy duty lines and light duty lines are then discussed and then the case study is examined to determine if ZBB and ABC are both valid techniques in assisting cost control.

5.2 Application of scratch budget and analysis of cost drivers

5.2.1 Budget process and summary of results.

5.2.1.1 How the budget was prepared.

An outside consultant was employed to prepare the budget and

worked closely with the Managing Director, Deputy Managing Director, Financial Director, Sales Director and various line managers and staff to abstract detailed data. Revenues and costs were built up as set out below.

(i) Tonnages and sales

The starting point in the budget was to establish tonnages sold. The company had forecasted sales to the end of 1990 and the tons sold for heavy duty lines were extracted from this forecast and used as the sales for the budget. The average selling price per ton was applied to tons sold, customer by customer, to arrive at a turnover figure.

(ii) Material costs

Various combinations of board and liners are used to make a box. Board is standard. Liners are made up of virgin kraft paper of various widths, mist paper and baywhite paper. Requirements of board and lining were determined for each customer. The different materials were totalled, unavoidable waste calculated and added on, and the total material costed out.

(iii) Other cost of sales expenses

Distribution costs and settlement discounts were calculated for each customer to arrive at a total cost. The cost of electricity was determined from machines utilized to process the budgeted tons.

(iv) Factory labour

The machine routing and loading was determined for each customer. The hours derived from this exercise were summarised and used to determine the number of labourers required. The production manager was satisfied that manning requirements arising from the scratch budget were realistic and that a surplus pool was not necessary to cover peaks and valleys in machine utilisation.

(v) Maintenance and depreciation

The machine routing exercise established which machines were needed. Maintenance was determined for each machine employed on the basis of utilisation and PKG's depreciation policy was applied to the machines in use. Other machines mothballed by the budget were assumed to attract no depreciation.

(vi) Insurance

Insurance requirements were reassessed and provided for. The increase in the budget, over the forecast, is attributed to a strategic decision to reduce PKG's risk exposure.

(vii) Factory handling

The expense category incorporates the cost of forklifts and pallets both of which are related to material logistics. The expenses are budgeted in the light of handling material distribution for heavy duty lines only.

(viii) Other factory costs, internal
distribution, selling and finance

Each expense line and each cost element within that line - wages,

salaries and overheads - was budgeted on the basis of providing a minimum service for the revised tonnages processed.

(ix) Central charges

The amount is based on a revised directive from PKG's holding company.

5.2.1.2 Summary of results

Figure 20 sets out the results of PKG's scratch budget and this is compared to the 1990 forecast. The differences in sales value and in each cost centre is included. A more detailed build up to the costs in Figure 20 is included under Appendix D.

5.2.1.3 Identification of wastage

The cost reductions in Figure 20 are a combination of eliminating wastage and the exclusion of light duty lines from the manufacturing process. The differences were discussed with the deputy MD and the following areas of waste were identified:

(i) Cost of sales

Part of the budget exercise was to offer the light duty lines to associate companies of PKG and for this reason the cost of sales for light duty lines was calculated in detail. The cost of waste was established as set out below.

	Sales	Cost/sales
	<u>R'000</u>	<u>R'000</u>
Scratch budget for heavy duty lines	205,824	131,618
Detailed costing of light duty lines	19,388	12,176
to associated companies		
Theoretical cost	225,212	143,794
Forecast cost		<u>147,528</u>
Waste established		<u>3,734</u>

(ii) Factory labour

In 1989 PKG processed 106,000 tons and the level fell to 86,800 tons in 1990. Factory labour was not retrenched. The deputy MD estimated that 159 labourers were excess to manufacturing requirements. Therefore the number of labourers required for light duty lines are calculated by deducting budgeted labour and excess labour from the forecast for 1990.

(iii) Maintenance

PKG had subcontracted maintenance to a third party and have not decided to carry out the function internally at a cost saving of R2,258,000. Again the cost of maintenance for light duty lines is established by deducting budgeted maintenance and excess maintenance from the forecast of maintenance for 1990.

(iv) Factory handling

The forecast for 1990 includes a pallet write off of R444,000 which will not occur again and is highlighted under waste eliminated.

(v) Other factory costs

- These expenses are detailed under Appendix E. A number of expenses are labour related and the total of these are apportioned to excess labour in order to arrive at a cost for waste.

Other factory expenses were examined line by line and wastage, where applicable, was identified.

The cost of factory handling and other factory costs for light duty lines was arrived at by deducting budget costs and waste from the forecast for 1990.

5.2.1.4 Discussion

Figure 20 is resummarised in Figure 21. Wastage is itemised in a separate category. The budgets for rent and property and for insurance are not related to the strategy of divesting light duty lines. To ascribe the difference between forecast and heavy duty lines to light duty costs will be a distortion. They have therefore been categorised under "others".

The budget has identified that light duty products are unprofitable and that there is wastage both in material usage and in expenses. With respect to light duty lines the management of PKG did not believe that labour could be engineered downwards, or that machines driving maintenance, depreciation and other factory costs could be reduced or that selling expenses could be reduced. However wastage can be managed downwards.

FIGURE 21
(Case Study 2)

SUMMARY OF REVENUE AND COSTS BY PRODUCT TYPE
- ANALYSIS PER SCRATCH BUDGET

R'000	TOTAL FORECAST 1990	HEAVY DUTY SCRATCH BUD. 1990	LIGHT DUTY DIVESTED	WASTE ELIMINATED	OTHERS
TONS	86,826	79,921	6,902		
CUSTOMERS	300	102	198		
MACHINES	144	96	48		
FACTORY LABOUR	975	656	160	159	
SALES	225,212	205,824	19,388		
COST OF SALES	147,528	131,618	12,176	3,734	
CONTRIBUTION	77,684	74,206	7,212		
% Contr./Sales	34.5%	36.1%	37.2%		
EXPENSES					
FACTORY LABOUR	24,526	17,438	3,555	3,533	
MAINTENANCE	11,502	7,254	1,990	2,258	
DEPRECIATION	5,656	4,554	1,102		
RENT AND PROPERTY	3,920	2,804			
INSURANCE	1,810	1,936			
FACTORY HANDLING	2,382	1,430	478	444	
Maint to forklifts	448	360	88		
Lease rentals of forklifts	774	600	174		
Pallet purchases	716	500	216		
Pallet write off	444			444	
OTHER FACTORY COSTS	6,298	4,958	698	642	
People driven	1,814	1,220	298	296	
Others	4,584	3,738	405	346	
INTERNAL DISTRIBUTION	2,120	1,482	638		
SELLING	5,224	2,784	2,240		
FIN & ADMIN	8,640	8,540	100		
CENTRAL CHARGES	3,636	3,120	516		
TOTAL OF EXPENSES	75,514	56,430	11,317	6,877	890
OPERATING PROFIT	2,170	17,776	(4,105)	(10,611)	(890)
% to Sales	1.0%	8.6%	-21.2%	-4.7%	-0.4%

The budget has identified two key areas where, by application and revised strategy, profits can be improved.

5.2.2 Cost drivers

5.2.2.1 Introduction

Circumstances have not permitted a classification of costs into the activities of PKG's value chain and from this the costing of heavy duty and light duty lines on the basis of transactions generated by the two product groups. As an alternative costs deemed to be associated with factory labour, machine and related, and selling are grouped and summarized under Figure 22. These make up 70% of the total costs of the budget for PKG. The unit costs for each of these expense groups, or activities, are calculated for heavy duty and light duty lines. Labour costs are divided by persons, machine costs by machines, and selling costs by customers. In each area the unit cost for light duty lines is less than for heavy duty lines. These expenses are then divided by the number of tons. In each area the R/ton cost for light duty lines far exceed that for heavy duty lines.

It is assumed that the high frequency of chop and change in manufacture, the more complex operation and the wider customer base for light duty lines, as compared to heavy duty lines, have served to create a higher level of transactions and draw off on resources for light duty lines.

FIGURE 22 (Case study 2) EXPENSES GROUPED INTO COST DRIVERS

COST DRIVERS	EXPENSE DESCRIPTION	FOURCAST (R'000)	SCRATCH BOD. HEAVY DUTY (R'000)	DIVERTED LIGHT DUTY (R'000)	WASTE & UNEXPLAINED (R'000)
PEOPLE	Factory - salaries and wages Other factory costs - people driven	24,520 1,814	17,430 1,220	3,555 298	3,533 296
		26,334	18,650	3,853	3,829
MACHINES	Maintenance Depreciation Factory handling Internal distribution	11,302 5,056 2,332 2,120	7,354 4,554 1,460 1,462	1,990 1,192 478 638	2,250 444
		21,650	14,750	4,208	2,702
CUSTOMERS	Hollings	5,924	2,704	3,220	
TONNAGES	Insurance Other factory costs	1,010 4,466	1,936 3,738	400	(125) 360
		5,294	5,674	400	235
CUSTOMERS/TONS PEOPLE	Finance and Admin	8,540	8,540	100	
FIXED	Rent and Property Financial charges	3,920 3,934	2,904 3,120	310	1,016
		7,854	6,024	310	1,016
	TOTAL	75,514	56,430	11,312	7,767

UNIT AND TONNAGE COST COMPARISONS

SCRATCH BOD. HEAVY DUTY (R'000)	DIVERTED LIGHT DUTY (R'000)	SCRATCH BOD. HEAVY DUTY 75924 tons R/TON	DIVERTED LIGHT 6902 R/
Person 656	Person 160		
R/unit 20,442	R/unit 24,081	223	55
Machine 96	Machine 48		
R/Unit 153,646	R/unit 87,667	105	86
Costs R/unit 27,294	Costs R/unit 14,313	35	32

5.2.2.2 Discussion of specific costs and possible cost drivers

Specific examples of product and customer complexity with respect to light duty lines and how they drive costs are examined below. The discussion is based on Figure 22 which groups PKG's costs into various categories.

(i) Labour

	Heavy duty <u>lines</u>	Light duty <u>lines</u>	Ratio of Heavy <u>duty to light duty</u>
Tons	79,924	6,902	
Labourers	656	180	
Tons/Labourers	122	43	2.8

Labourers achieve 2.8 times more through put for heavy duty lines than for light duty lines. Set up times take up 30% to 40% for any one production run as all boxes are printed and the set up time for printing is a lengthy process. It is evident from Figure 19 that production runs for light duty lines are smaller in volume and occur more frequently. This explains the lower tonnage to person output for light duty lines compared to heavy duty lines.

Other Factory costs, which are grouped with labour include expenses such as first aid and canteen that are people driven and therefore are apportioned to products on the basis of the people they employ. As labour is costed directly to heavy duty and light duty lines an ABC exercise would have arrived at a similar cost allocation.

(ii) Machine related costs

	Heavy duty <u>lines</u>	Light duty <u>lines</u>	Ratio of Heavy <u>duty to light duty</u>
Tons	79,924	6,902	
Machines	96	48	
Tons/Machine	832	144	5.8

The production process is more complex for light duty lines than for heavy duty lines, particularly with respect to the printing operation. Therefore each box goes through more processes and machines for light duty lines than for heavy duty lines. Even though the machines are smaller and less expensive to maintain the number required for the light duty process generates a greater R/ton cost than that for heavy duty lines.

Maintenance and depreciation are costs incurred directly by machines and therefore no allocation method is required.

Included in factory handling is the cost of maintaining and running of forklifts and the costs of purchasing pallets. This activity is not exclusively determined by tonnages as materials are delivered from machine to machine during the production process. Therefore the number of machines will also determine the use of this resource. One method of allocating these costs is to weight 50% of the use of this resource to tons and 50% to machines. The allocation between heavy duty lines and light duty lines is therefore determined as set out below.

	Heavy duty <u>lines</u>	Light duty <u>lines</u>
Tons	79,924	6,902
% split	92%	8%
50% weighting	46%	4%
Machines	96	48
% split	66%	34%
50% weighting	<u>33%</u>	<u>17%</u>
% allocation for ABC	<u>79%</u>	<u>21%</u>

The wages and salaries paid to persons employed in maintaining a job routing and works order system make up the cost centre of internal distribution. To allocate these costs on tons would be an over simplification. Job runs are longer, and are routed through fewer machines for heavy duty lines than for light duty lines and therefore require less administration, planning and paperwork per ton processed. In the absence of job routing details the number of machines employed for heavy duty lines and for light duty lines is considered to be a more realistic cost driver than the number of tons. Each machine loading generates administration work and therefore will be a transaction that draws on the internal distribution activity.

Assuming that waste was identified then the cost of machine related expenses for light duty lines is established below using machines as a cost driver. These costs are compared to the budget.

	Total cost	Heavy	Light	Budget for
R'000	before waste	Duty	Duty	Light duty
Machines & tons	100%	79%	21%	
Machines	<u>144</u>	<u>96</u>	<u>48</u>	
Directly costed				
Maintenance	9,244	7,254	1,990	1,990
Depreciation	5,340	4,554	1,102	1,102
Allocated on machines and tons				
Factory Hand.	1,938		406	478
Allocated on machines				
Internal Distr.	2,120		<u>706</u>	<u>638</u>
			<u>4,204</u>	<u>4,208</u>

The cost for "machine driven" by allocation for light duty lines is within 1% of costs derived by the budget. This small difference is ascribable to the high proportion of direct allocations and compensating differences in factory handling and internal distribution. It is assumed that an ABC analysis would have arrived at a cost allocation similar to that arrived at by the budget with respect to the above expenses grouped as machine driven, providing waste was identified.

(iii) Selling expenses

If the cost driver for selling expenses is the number of customers then expenses would be allocated as set out below.

	Customers	Selling costs allocated on customers	Selling costs per budget
		R'000	R'000
Heavy duty	102	1,708	2,784
Light duty	<u>198</u>	<u>3,316</u>	<u>2,240</u>
	<u>300</u>	<u>5,024</u>	<u>5,024</u>

When interviewed the deputy MD said that PKG wanted to service the remaining customers more intensively and that is why the expense level did not decrease proportionately to the number of customers.

Alternatively selling costs could be driven by the number of calls and it is not unreasonable to assume that the customers purchasing greater quantities would be called on more frequently than customers purchasing small quantities. If it is assumed that salesmen call on customers two times a month for customers purchasing heavy duty and once a month for customers purchasing light duty lines then the above allocation is recalculated as below.

	Customers	Selling costs allocated on customers	Selling costs per budget
		R'000	R'000
Heavy duty	204	2,549	2,784
Light duty	<u>198</u>	<u>2,475</u>	<u>2,240</u>
	<u>402</u>	<u>5,024</u>	<u>5,024</u>

In either analysis, i.e. allocating by customers or by budget, it is evident that the wide customer base is driving a disproportionate level of selling expenses for light duty lines in relation to the tons sold for that line when compared to heavy duty lines.

5.2.2.3 Conclusions

Whilst transactions have not been extracted and analysed there is sufficient evidence in paragraph 5.2.2.2 above to demonstrate that an ABC analysis would have arrived at a similar result to the budget providing that major wastage in labour and maintenance were identified and excluded from the analysis. An absorption analysis of PKG's revenues and costs is reflected in Figure 23 as an alternative method in determining costs for the two product lines. Light duty lines are also identified as making a loss in this analysis. The high level of labour for light duty lines identifies it as being unviable with existing selling prices.

5.3 Discussion and conclusions

The scratch budget has identified that the elimination of material waste and non value adding expenses can increase profits by R10,611,000 or 4,7% of forecasted sales. This is a significant improvement over the forecasted profit of R2,170,000 p.a. In addition the budget has identified that losses are incurred for the light duty product range. The budget is a valuable strategic tool in enhancing profits for PKG.

FIGURE 23 (Case Study 2)

ABSORPTION COST ANALYSIS

R'000	TOTAL FORECAST 1990	HEAVY DUTY SCRATCH BUD. 1990	LIGHT DUTY DIVESTED	WASTE ELIMINATED	UNEXPLAINED
SALES	225,212	205,824	19,388		
COST OF SALES	147,528	134,828	12,700		
CONTRIBUTION	77,684	70,996	6,688		
% Contr./Sales	34.5%	34.5%	34.5%		
EXPENSES	75,514	64,165	11,349		
FACTORY LABOUR	20,993	17,438	3,555		
SURPLUS LABOUR	3,533	2,935	598	Spread on factory labour	
OTHER FACTORY COSTS	31,568	26,222	5,346	-----"	
INTERNAL DISTRIBUTION	2,120	1,760	360	-----"	
SALES EXPENSES	5,024	4,591	433	Spread on sales	
ADMIN AND OTHERS	12,276	11,219	1,057	-----"	
OPERATING PROFIT	2,170	6,831	(4,661)		
% to Sales	1.0%	3.3%	-24.0%		
COMPARED TO SCRATCH BUDGET	2,170	7,776	(4,105)	(10,611)	(890)
% to Sales	1.0%	8.6%	-21.2%	-4.7%	-0.4%
DIFFERENCE	0	10,945	556	(10,611)	(890)
% to Sales	0.0%	-5.3%	-2.9%	4.7%	0.4%

FIGURE 24 (Case study 2)

SUBSTITUTE FOR ABC ANALYSIS

R'000	TOTAL FORECAST 1990	HEAVY DUTY SCRATCH BUD. 1990	LIGHT DUTY DIVESTED	WASTE ELIMINATED	UNEXPLAINED
SALES	225,212	205,824	19,388		
PROFIT PER SCRATCH BUDGET	13,671	17,776	(4,105)		
WASTE AND OTHERS	(11,501)	(10,510)	(991)		
REVISED PROFIT	2,170	7,266	(5,096)		
% to Sales	1.0%	3.5%	-26.3%		
COMPARED TO SCRATCH BUDGET	2,170	17,776	(4,105)		(890)
% to Sales	1.0%	8.6%	-21.2%		-0.4%
DIFFERENCE	0	10,510	991	(10,611)	(890)
% to Sales	0.0%	5.1%	5.1%	-4.7%	0.4%

It is considered that an ABC exercise would have identified light duty products as unprofitable. In Figure 24 waste and others from Figure 21 are prorated to heavy and light duty lines on the basis of sales to arrive at a profit split which includes waste costed into the two products. For discussion purposes only the results are used as a substitute for an ABC analysis.

It is apparent that the costing of wastage across both heavy duty and light duty lines is a weakness in ABC methodology. The differences between the budget and analysis on Figure 24 are summarised below.

	Difference in Profit per Budget and ABC	% to Sales
	R'000	
Heavy duty lines	10,510	-5,1%
Light duty lines	991	-5,1%
Waste	(10,611)	4,7%

Either under ABC analysis or by a more detailed cost allocation process light duty lines appear to be unviable and without increases of up to 26% on selling prices they will not breakeven. Heavy duty lines reflect a profit of 3,5% to sales under ABC analysis and 8,6% from the budget exercise. Customers are sensitive to prices as the volume offtakes are large for any one order. The budget exercise provides an additional 5,1% selling price elasticity for heavy duty lines over the ABC

analysis and this could make the difference in obtaining or losing orders. The elimination of waste of 4.7% to sales identified in the budget exercise can either enhance profits or give PKG an opportunity to compete by further reducing selling prices.

It is probable that labour and possible that maintenance would be costed direct to the two product lines using ABC. Therefore R5,791,000 or 55% of the total waste could be eliminated from the ABC analysis reducing the distortion effect in spreading waste over products. In this respect ABC would have emerged as a superior methodology to absorption costing in allocating costs to products.

In this case study ZBB has identified significant areas of waste which constitutes a problem of greater magnitude than the losses incurred by light duty lines. For this reason ZBB is of greater benefit to PKG than the employment of ABC. Further, alternative cost allocation methods (including direct allocations) will identify light duty lines as making losses. The incidence of a high value of excess waste at PKG has led to ZBB being of greater benefit in cost control than ABC.

6. COMPARISON OF CASE STUDIES. COMPARISON OF CASE STUDIES TO THE SURVEY OF LITERATURE. AND CONCLUSIONS.

6.1 Restatement of objectives

Any enterprise will wish to spend money productively and the purpose of this report has been to show that ZBB and cost driver analysis, or ABC, are both cost control techniques that can be employed to maximise outputs for cost inputs. The theories underlying ZBB and ABC were examined in the review of literature. ZBB and ABC were applied to a greater or lesser extent in the two case studies.

The results of the case studies are first discussed and then compared and contrasted with the survey of literature.

6.2 Case study 1

ZBB focused on the financial department of a division, selling Unix and PCs, of a large computer company. The division operates with minimum resource. The ZBB therefore did not identify unnecessary persons or facilities within the financial division. It did, however, justify the employment of a business controller who was demonstrated to generate income greater than the cost of her employment. As she is a candidate whom the holding company wishes to make redundant ZBB has assisted in preventing the discontinuation of a revenue producing resource. Other than this

little benefit was gained by using ZBB.

ABC, on the other hand, clearly demonstrated the problems in selling PCs from a strategic point of view and highlighted the need for serious consideration to be given to the continuation of the PC line.

In this case study ABC is considered to be of greater value than ZBB in promoting cost control as all expenditure for PCs is questionable as the revenue generated by PCs provides an inadequate return. Whilst ZBB has been demonstrated as able to identify expenses for Unix only or PCs only, it does not consider overall product profitability whereas ABC does.

Because detailed cost control is not a problem, and because product profitability is a problem for the PC range, ABC has been of greater value than ZBB in this case study.

6.3 Case study 2

ZBB built up all expenses from scratch in the light of a specific strategy to manufacture and sell the heavy duty lines of a packaging company and to divest light duty lines. The budget was not a bottom up process, decision packages were not employed and a ranking procedure was not used to consider options in resource employment. But then the ZBB was an exercise to determine the minimum resource required to support a revised product, sales and manufacturing strategy rather than an exercise on how to optimise

discretionary expenditure. This exercise identified areas of significant wastage. The value of this wastage was quantified as R10,611,000 which is five times as much as the profit of R2,170,000 achieved by the company. The ZBB, or scratch budget, also identified light duty lines as being unprofitable.

It is considered that ABC would have identified light duty lines as being unprofitable. However an absorption cost analysis also arrived at a similar conclusion. Further a non value productivity analysis, such as tons per person, would also have identified light duty lines as a problem area.

In this case study ABC is an allocation method that does not provide any significant benefit to PKG over that employed by other costing methods. ZBB, or a scratch budget, has identified areas of excessive wastage, some of which would likely have escaped notice in cost allocation methods.

Because wastage is material, and because alternative costing methods were able to identify light duty lines as making losses, ZBB has been more beneficial in promoting cost control and profitability than ABC.

6.4 Comparison of Case study 1 to Case study 2

ABC was of greater benefit than ZBB in case study 1 and ZBB was of greater benefit than ABC in case study 2.

In case study 1 the department examined did not employ unnecessary resource and therefore little benefit could be obtained from the employment of ZBB. Whereas in case study 2 a number of areas of waste were identified by ZBB thus promoting this method as a beneficial technique.

Whilst it was apparent that PCs were not as profitable as Unix in case study 1 it took ABC to demonstrate that PCs were unviable and that a strategy needed to be put into place to make the line economic. Neither marginal costing or absorption costing arrived at this conclusion. Whereas in case study 2 absorption costing was as effective as ABC in identifying the unviability of light duty lines.

6.5 General conclusion from the case studies.

The case studies lead to the conclusion that the value of ZBB and ABC are dependent on the cost structure of a company. Where wastage is minimal the value of ZBB diminishes and where wastage, or non value adding expenditure, is excessive the value of ZBB increases. Where revenue, cost and volume relationships are obvious the value of ABC decreases but where cost interrelationships are complex, and not apparent through simple cost allocation methods, the value of ABC increases.

6.6 Comparison of conclusion arrived at from the case studies with those arrived at in the survey of literature.

6.6.1

ZBB

From the survey of literature it was concluded that the main purpose of ZBB is to assist an organisation in maximising benefits for discretionary expenditure and that ZBB is superior to traditional budgeting in achieving this end. There was little scope for cost reduction in case study 1 and therefore the use of ZBB was limited. However the decision package for employing a business controller highlighted the net income generated by the activity. This activity could have been arbitrarily discontinued under a traditional budget. Excess waste was identified by ZBB in case study 2. The forecast, which extrapolated costs forward for the year, was similar to a traditional budget and this failed to identify wastage.

ZBB identified both areas of waste and opportunities for profit in the case studies, that would not have been identified by traditional budgeting. The case studies therefore confirm the conclusion of the literary survey that ZBB is a viable technique to maximise outputs for cost inputs.

The survey of literature did not discuss the degrees of usefulness for ZBB but arrived at a general conclusion for ZBB whereas the case studies highlighted that the applicability of ZBB depends on the circumstances pertaining to a company.

6.6.2

ABC

The survey of literature concluded that the main purpose of ABC is to segment a company by product, customer or market with a view to isolating areas of favourable or poor profitability. This strategic information will enable a company's management to enhance profitability. The literature affirmed that ABC is a superior method in tracing costs back to the source that drive them over alternative cost allocation methods such as marginal or absorption costing.

The case studies indicate that circumstances unique to each company influence the usefulness of ABC. The theme developed in the survey of literature was that overheads have increased and the number of products manufactured and sold have also increased in many companies. Simplistic cost allocation methods, such as marginal and absorption costing, adequately serve a company with low overheads and a small range of products but are inadequate for the more complex cost structures of modern business. ABC was examined and found to be an appropriate and effective cost allocation technique for these complex cost structures.

Cost relationships were not immediately apparent in case study 1. A financial department is viewed as fixed in traditional costing systems and is therefore arbitrarily spread over products using absorption costing. ABC however identified that PCs were the predominant cost driver of this department despite the fact that sales are marginally lower for PCs than for Unix. ABC also identified that the cost of holding stock was almost entirely attributable to the PC range. Thus PCs were identified as an

unviable line under ABC whereas profitability for PCs was acceptable using absorption costing.

Therefore case study 1 supports the findings of the literary survey to the effect that ABC is a valuable strategic tool and more beneficial than simple cost allocation techniques.

In case study 2 it was demonstrated that absorption costing was as effective in identifying light duty lines as making losses as that identified by using ABC (or the surrogate in place of ABC). Because the two product lines are discreet in PKG, and because many costs can be directly allocated, the cost structure could be considered simplistic. Therefore ABC is not necessary as a technique to allocate costs. Absorption costing is sufficient. This supports the findings in the literature, namely that simple cost systems are adequate for simple cost structures.

Both case studies support the findings and conclusions drawn from the survey of literature on ABC.

6.6.3 Summary

The general conclusion drawn from the case studies is that the use of ZBB and ABC in promoting cost control depend on the circumstances of a company. How well are costs controlled in the first place and how complex is the revenue/cost structure of a company?

The background to ZBB in the survey of literature assumed that traditional budgeting could include hidden inefficiencies and this was the setting in which ZBB was discussed as a cost control technique. The efficient cost structure in case study 1 was not considered and therefore the use of ZBB, as developed in the literature, is not negated by case study 1. It is simply not strongly supported. Case study 2 identified areas of waste using ZBB and supports the literary survey which shows ZBB as a superior cost control technique over normal budgeting.

As discussed in para 6.6.2 the case studies support the findings of the survey of literature which highlights that ABC is necessary to understand complex cost/revenue structures but that simpler costing systems (such as marginal and absorption costing) are suitable as decision models for simple cost structures.

In summary the findings and conclusions from the case studies are in accord with the findings and conclusions arrived at from the survey of literature.

6.7 Validity and applicability of the survey of literature

ZBB is established in the survey of literature as a technique to improve resource allocation, improve decision making, reduce costs without sacrificing outputs and encourage innovative thinking by managers. Both case studies have affirmed these benefits. Innovative thinking was not discussed in the case studies but the process of preparing decision packages in the

case study 1 gave XYZ's management a clearer insight into its financial department and alternative options were examined as to how to provide a financial service to XYZ which had not been previously considered.

ABC is established by the survey of literature as a superior technique in cost allocation over traditional costing methods and therefore better able to identify product (and customer and market) profitability thus promoting superior decision making. The first case study confirmed the findings of the literature. Figure 8 in the survey of literature demonstrates that peripheral, or non-core, products can generate losses because the high level of transactions necessary to support these products create an expensive cost structure. Focus, or the discontinuation of these products, is recommended as a course of action to improve profitability. Case study 2 supports the findings from the literature. Para 2.3.4 discusses ABC as a methodology to identify non value adding activities and thus assist in eliminating unnecessary costs. Whilst this was briefly touched on in the case studies, neither of them examined ABC in detail as a method to assist in cost reduction.

The survey of literature showed both ZBB and ABC to be superior, but different, cost control methods to traditional cost control systems, such as normal budgeting and absorption costing, and this finding is supported in both case studies.

6.8 Were the objectives of this report achieved?

All three objectives have been met.

6.8.1 ZBB and cost driver theory, or ABC, have been examined from the literature and the two techniques have been compared and contrasted.

6.8.2 ZBB and ABC have been applied in two case studies and the similarities and differences in the methods have been discussed.

6.8.3 The case studies have been compared and contrasted with the relevant literature and conclusions have been drawn as to the applicability of ZBB and ABC.

6.9 Further research

The case studies showed that the usefulness of ZBB and ABC depends on the cost structure of a company. It could be advantageous to research areas where ZBB is of greater use and lesser use and areas where ABC is of greater and lesser use.

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1. Economies or diseconomies of scale

Economies of scale assume that activities operating at full capacity are more efficient on a large scale. Unit costs decrease because fixed and semi variable costs are spread over a greater number. Economies of scale vary widely from industry to industry. However there is a point where increased activity causes an increase in complexity and thus an increase in the cost of coordination resulting in diseconomies of scale. Porter (1985) cites Eaton as an example of where a company maximised scale economies by simplifying its product line.

2. Learning and spillover

Learning increases efficiency. It is probable that speed of throughput will increase on reduced labour and material wastage over a period of time. Companies that gain this experience should endeavour to keep the know how proprietary. Competitors try to circumvent the learning curve by taking ideas from their opposition. Pryor (1989) cites Xerox who copied LL Bean's warehousing and shipping systems (in which LL Bean excelled) and saved themselves learning costs.

3. Pattern of capacity utilisation

Two companies may have the same average utilisation. The company that achieves a constant throughput will enjoy lower costs than one that experiences peaks and valleys. Overtime, or alternatively recruiting and laying off labourers, generate additional costs. The use of subcontractors is recommended to handle surges in demand as capacity utilisation can be kept level.

4. Linkages

Activities in a company are not discrete but impact on each other. For example the purchase of cheap components may result in downtime on the production line, rework, scrap, warranty work and legal fees. An appreciation of linkages could lead to high quality components being purchased, the cost differential being less than the hidden costs generated by poor quality. Porter (1985) cites the understanding of linkages as creating the opportunity to lower the total cost of linked activities and as potentially being a powerful source of cost advantage.

5. Interrelationships

If one company can share the services of another company, such as a distribution organisation or financial service, each company enjoys the service at half the competitors' cost.

6. Integration

Porter (1985) says "...every value activity employs or could employ purchased inputs, and this involves explicit integration choices." Backward integration can eliminate suppliers profit and transport costs which form part of purchase costs and a similar logic can apply to forward integration. But either option can increase complexity and distract the company from its core focus so that the benefits and disadvantages of integration need to be assessed. An example of a bad integration move is where a company decides to run its own truck fleet and disposes of its contractor. They then find that they are unable to administer the fleet with anywhere near the efficiency of the contractor and because the fleet is dedicated to the company they can experience idle capacity. Good integration is where a supplier has a monopoly on inputs and artificially raises prices.

7. Timing

Timing can either raise or lower costs relative to competitors. The company that moves first in launching a product on the market may have lower costs in establishing and maintaining their brand name. But the follower has the advantage of obviating research and development costs. Timing choices are individual and unique to each company.

8. Discretionary policies independent of other cost drivers

Policies have a significant bearing on costs and cost analysis must uncover their effect. Examples are

- wages paid and amenities provided to employees, e.g. the application in RSA of the Sullivan code
- product configuration
- level of service provided
- delivery time
- product quality

The benefits of lower cost versus differentiation need to be weighed up.

9. Location

Where a value activity is located affects costs in a number of ways

- prevailing cost of labour
- management
- scientific personnel
- raw materials
- energy
- taxes

The clothing industry in RSA provides an interesting example. The manufacturing process is labour intensive and most companies have established plants in homelands where labour is significantly cheaper than urban areas with the added benefit of being non unionised. A company setting up in Johannesburg would find it difficult to compete on a cost basis. But with increased unionisation in homelands and the possibility of wage bargaining shifting from plant to corporate level wage differences may reduce between rural and urban areas. The increased cost of transport may give cost advantage to plants in urban areas. Either way location is critical to the industry.

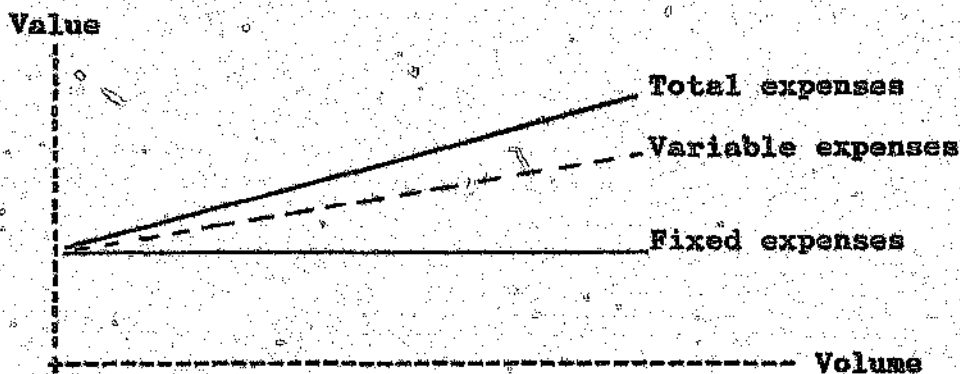
10. Institutional factors

Examples of institutional factors are government regulations, tax exemptions, unionisation, tariffs and local content policies. Favourable institutional factors can lower costs just as unfavourable ones can raise them. Whilst the formulation of these are outside a company's control they can optimise on them by intelligent positioning.

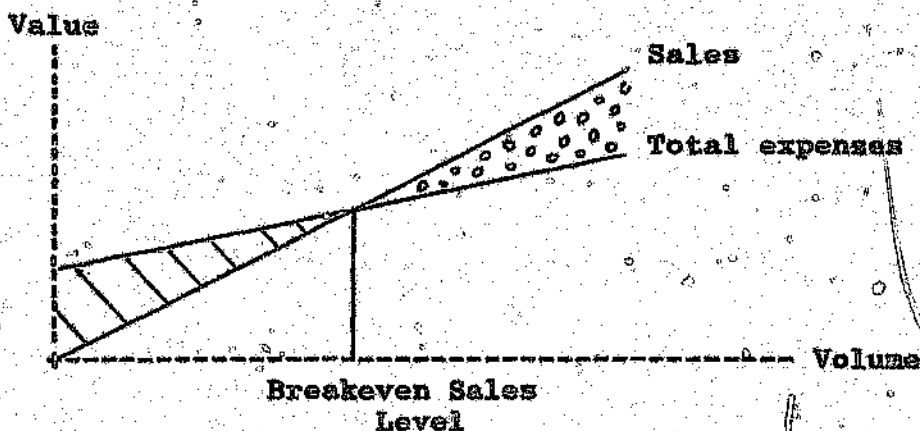
APPENDIX B

BREAKEVEN CHART

1. EXPENSE STRUCTURE

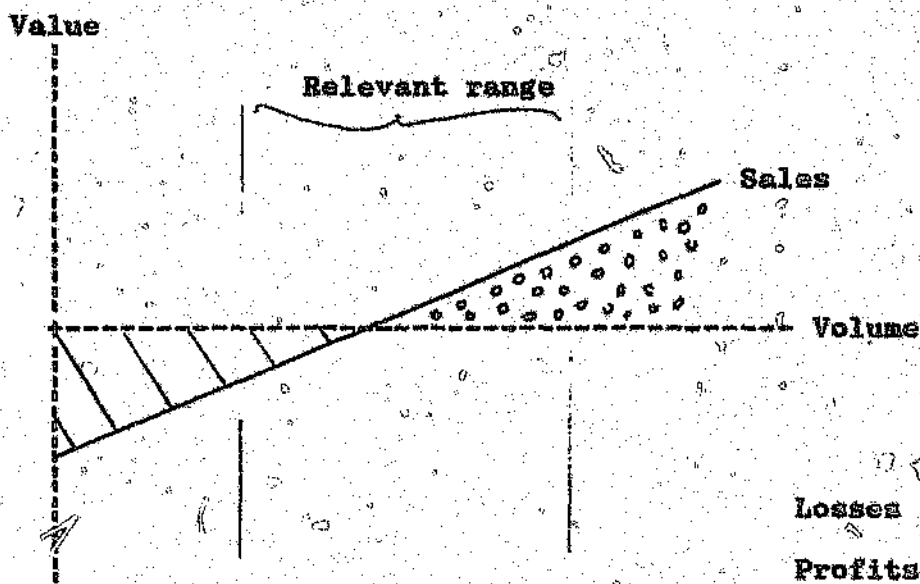


2. BREAKEVEN CHART (1)



3. BREAKEVEN CHART (2)

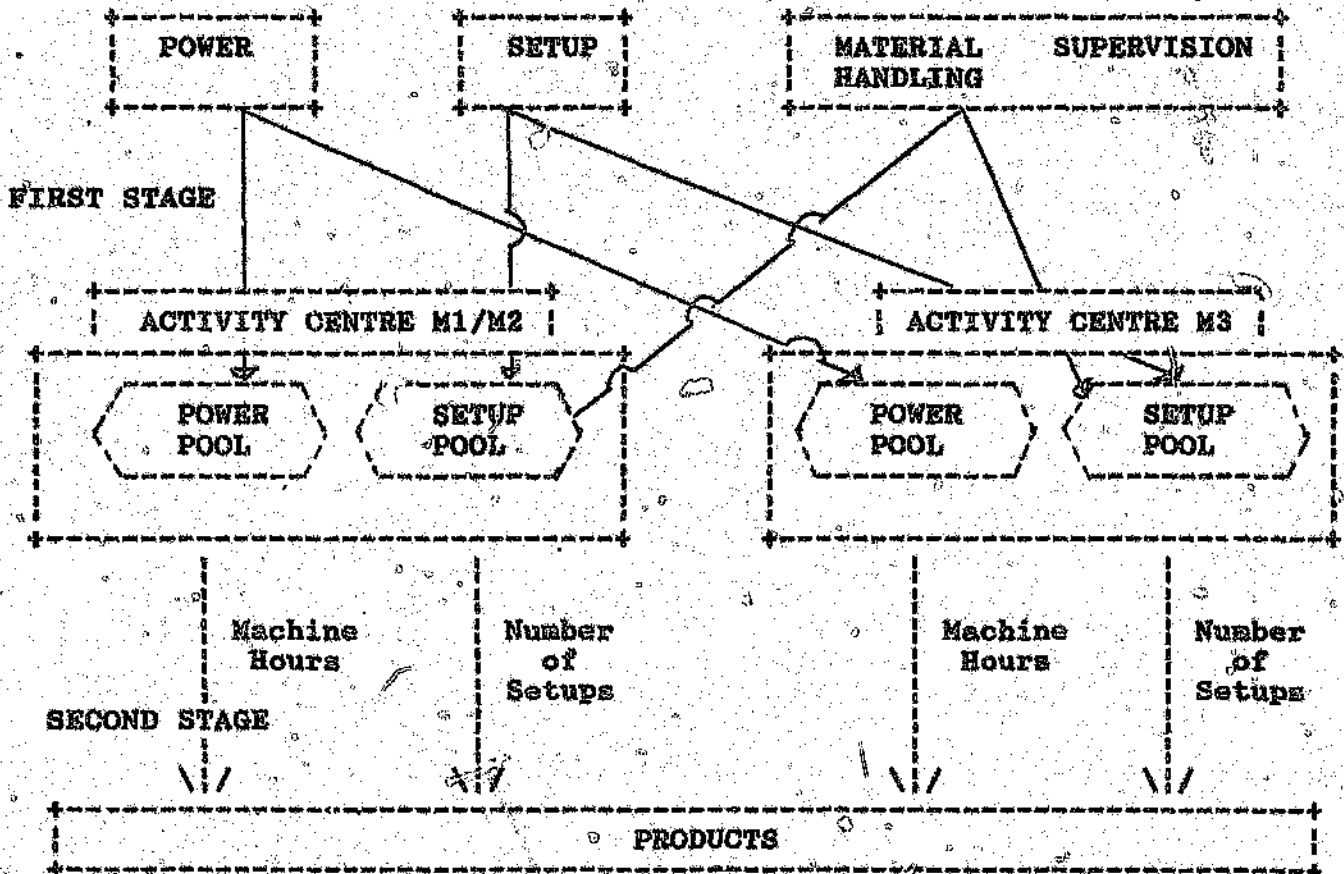
PROFIT/VOLUME GRAPH



APPENDIX C

ABC METHODOLOGY

BASED ON THE PEN COMPANY ACTIVITY COSTING SYSTEM
(Romano, 1989b, p65 ... Source; R.Cooper)



APPENDIX D DETAILED BUILD UP OF EXPENSES : FORECAST 1990 COMPARED TO SCRATCH BUDGET 1990
(Case Study 2)

R'000												
	OVERHEADS	WAGES	FORECAST SALARIES	MAINT & REPAIRS	OTHERS	TOTAL	OVERHEADS	WAGES	SCRATCH BUDGET SALARIES	MAINT & REPAIRS	OTHERS	TOTAL
VARIABLE COSTS												
RAW MATERIALS					136,802	1,36,802					121,702	121,702
DISTRIBUTION					8,044	8,044					7,180	7,180
POWER AND WATER					2,094	2,094					1,920	1,920
SETTLEMENT DISCOUNTS					2,778	2,778					2,020	2,020
WASTE RECOVERIES					(2,190)	(2,190)					(1,810)	(1,810)
	0	0	0	0	147,528	147,528	0	0	0	0	131,818	131,818
FACTORY COSTS												
SALARIES AND WAGES		19,492	5,034			24,526		14,482	2,978			17,430
MAINTENANCE (EX LABOUR)				11,562		11,562				7,254		7,254
DEPRECIATION				5,060		5,060				4,554		4,554
RENT AND PROPERTY	3,920					3,920	2,904					2,904
INSURANCE	1,810					1,810	1,936					1,936
FACTORY HANDLING	2,382					2,382	1,460					1,460
OTHERS												
Sundry	1,934					1,934	1,320					1,320
Clean & misc stores	700					700	440					440
LA tax	202					202	200					200
Stores	1,046					1,046	1,030					1,030
Paper handling	502					502	382					382
Security	1,046					1,046	812					812
Quality	46					46	44					44
Training	224					224	204					204
First Aid	70					70	80					80
Timekeeping	28					28	24					24
Canteen	502					502	342					342
	6,298	0	0	0	0	6,298	4,958	0	0	0	0	4,958
	14,410	19,492	5,034	17,158	0	56,094	11,258	14,482	2,978	11,808	0	40,504
SALES EXPENSES												
INTERNAL DISTRIBUTION		1,142	976			2,120	18	898	468			1,482
SELLING EXPENSES	1,678	16	3,490			5,024	760		2,924			2,784
FINANCIAL/ADMIN	2,282	1,208	5,170			8,660	1,932	1,082	5,528			5,540
CENTRAL CHARGES	3,636	0	0			3,636	3,120					3,120
	7,416	2,366	9,030	0	0	19,420	5,830	2,080	0,816	0	0	15,926
	21,028	21,850	14,672	17,158	147,528	223,042	17,088	10,542	10,992	11,808	5,618	180,048

APPENDIX E (Case study no 2)

OTHER FACTORY COSTS

		FORECAST 1990	RESTRUCTURE 1990	REASONS OTHER THAN DIVESTMENT OF LIGHT DUTY LINES BEHIND COST REDUCTIONS	
		R'000	R'000	IMPROVED EFFICIENCY	REDUCTION IN LABOUR
		-----	-----	R'000	R'000
LABOUR RELATED	SERVICE AWARDS	30	20		
	UNIFORMS	180	120		
	TRANSPORT	368	200		
	STAFF WELFARE	178	80		
	ENTERTAINMENT	26	18		
	XMAS PARTY	130	80		
	RSCs	294	278		
	1st AID	70	80		
	TIMEKEEPING	26	24		
	CANTEN	602	342		
		1,614	1,220		
OTHERS	EFFLUENT	390	140		
	STATIONERY	244	200		
	PAPER HANDLING	602	382		
	CLEAN & MISC STORES	700	440		
	DEPRECIATION	218	222		
	RECRUITMENT	0	60		
	LOCAL TRAVEL	10	8		
	SUBSCRIPTIONS	2	8		
	MINOR ASSETS	88	12		
	STEREOS & DIES	1,048	1,030		
	SECURITY	1,048	912		
	QUALITY	46	44		
	TRAINING	224	204		
		4,484	3,738		
		8,298	4,958		
		-----	-----		
				260	Tightening up in issue of materials from consumables store
				4	Less travel allowed
				44	Employees made to operate on less resource
				16	Nominal saving budgeted
				2	Nominal saving budgeted
				20	Minor reduction in courses
				348	

Pro rata of 182 persons
to total of 978 employees
(150/978 * R1814k)

Author: Borthwick John Alistair Stewart.

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