THE CONTENT OF OVERHEAD COSTS

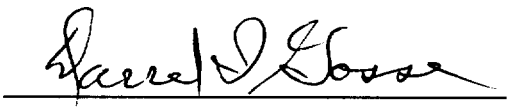
A Survey of Indiana Manufacturers

An Honors Thesis (HONRS 499)

by

Kenneth E. Diggs

Thesis Advisor: Darrel I. Gosse



Ball State University

Muncie, Indiana

July 18, 1994

Expected Date of Graduation: July 23, 1994

PURPOSE OF THESIS

The purpose of this thesis is to determine whether "overhead costs" in Indiana manufacturing companies can be classified by major types of resources and support activities. In order to accomplish this purpose, a survey of Indiana manufacturing companies was conducted. The results of the survey were then compiled and analyzed. This work includes an extensive background discussion, a summary of the methodology used, the results of the survey and the conclusions made, and a detailed discussion of responses to individual questions.

THE CONTENT OF OVERHEAD COSTS
A Survey of Indiana Manufacturers

INTRODUCTION

The purpose of this thesis is to determine whether "overhead costs" in Indiana manufacturing companies can be classified by major types of resources and support activities. The findings of this work are relevant to recent movements toward the use of Activity-Based Costing (ABC) methods by manufacturers.

BACKGROUND -- OVERHEAD IN MANUFACTURING COMPANIES

In traditional cost systems of manufacturing companies, "overhead" is the descriptive term for all production costs not otherwise classified as either "direct materials" or "direct labor." Traditional costing systems use allocations to assign overhead costs to products. Most commonly, the overhead costs are allocated to products based on the products' proportionate direct labor costs, although some companies use the products' proportionate direct labor hours or machine hours. The accounting methods for allocations of overhead costs were developed during the mid-1800s by U.S. railroad companies. These methods have been satisfactory for many years.

Dramatic changes have occurred in manufacturing in the past decade, including: (1) computer-aided design of products and manufacturing processes, which reduces the life cycle of products because introduction of new designs is more feasible; (2) expansion of international competition among manufacturing companies, which reduces the life cycle of products; and (3) revised strategic objectives for manufacturers, with a greater focus on high quality in output, reduced dependence on inventories, and more flexible equipment. These important changes in the characteristics of modern production have also changed overhead costs. The overhead costs in modern factories include significant technological costs for equipment, tooling, and information, as well as increased labor for technical support required from workers. In

such modern factories with overhead costs that include significant technological resources and support activities, traditional allocations of overhead to products are likely to distort the costs of products, under-costing low-volume, newly-introduced products and over-costing other high-volume products [Cooper and Kaplan (1988)].

EMERGENCE OF ACTIVITY-BASED COSTING

Concerns for reliable measures of product costs have led many manufacturers to use activity-based costing methods for overhead costs. Activity-based costing (ABC) is a way of allocating overhead costs to products in two stages [Cooper (1987)]. In the first stage, the overhead costs are grouped or "pooled" into two or more activity groups. Examples of activity groups include machine setups, tooling maintenance, or parts assembly. In the second stage, the pooled overhead costs are assigned from the activity pools to products based on the proportionate use of the activities to make the products.

Some research has questioned the sufficiency of existing ABC methods regarding the content of overhead costs. The criticism of the research is that existing ABC methods focus mostly on the second stage, assigning activity costs to products, but are not well focused with respect to the first stage, the pooling of overhead costs into activity groups. To assign costs from activities to products helps managers to manage the cost consequences of product-focused competitive strategies, but the managers are left unaware of specific information about their use of resources to carry out the activities [Greenwood and Reeve (1992)]. In other words, assigning activity costs to products tells managers the cost results of their strategic decisions but does not reveal the causes of the costs.

CLASSIFYING OVERHEAD BY TYPE OF RESOURCES AND SUPPORT

These criticisms are the motivating basis of the present study. When users of ABC pool overhead costs into activity pools

(the first stage), can the poolings be based on specific knowledge of the kinds of resources and support costs provided to the activities? Gosse (1993) defines six kinds of resources commonly found in manufacturers: materials, workers, equipment, tooling, information, and facilities. Overhead costs include each of these resources, except for direct costs of materials and workers, which are separately classified as direct materials and direct labor.[1] In addition, each of the resources requires support costs, such as materials handling, supervision and training, maintenance, repairs, data processing, and custodial services.

The research question addressed in the present study was: can the overhead costs of a sample of manufacturing companies be classified by type of overhead resource?

METHODOLOGY

Using the Harris Directory of Indiana Manufacturing Companies, a sample of 443 companies was selected. The sample included all (378) manufacturers with 250 employees or more plus 65 companies with 150-249 employees. The 65 smaller-sized companies were randomly selected from the Indiana population of such companies and were included to assess whether the replies from the smaller companies were significantly different from the 378 larger companies (they were not). The rationale for selecting companies with at least 250 employees was that such companies were likely to have significant overhead costs and adequately developed methods for accounting for overhead.

A copy of the research questionnaire is attached to this paper. The questions include fourteen demographic questions designed to reveal the relative significance of the types of resources of the company, followed by six questions directed at

---

[1]Information provided on engineering "bills of materials" and "operations routings" is used as the basis for establishing direct materials and direct labor.

each type of resource. The purpose of the last six questions was to determine the composition of overhead by type of resource.

The initial questionnaire was mailed to each company's address (taken from the Harris directory), to the attention of the President or Chief Executive Officer. A post card follow-up was sent to the same address two weeks later. Two months after the first mailing, a third follow-up post card was sent to the same address, but to the attention of the Controller or Chief Financial Officer. In both post cards, the recipient was encouraged to FAX for another copy of the questionnaire if the first one had been misplaced.

RESULTS AND CONCLUSIONS

Out of 443 questionnaires sent, 185 (42%) replies were received, all of which were usable. My analyses indicated no non-response bias. Several exhibits summarizing the replies are attached to the paper. My general conclusions, based on the replies, were:

1. Overhead costs can be classified by type of resource (materials, workers, equipment, tooling, information, and facilities).
2. However, a rather significant proportion of the respondents' overhead costs are unclassified.

The fact that a significant proportion of the overhead costs could not be classified by resource type suggests that some overhead costs are incurred to support production activities broadly rather than to support particular kinds of resources. This conclusion is consistent with some recent literature which describes a hierarchical structure of production costs: unit-level, process level, product-level, and facility-level costs [Cooper, 1988].

Detailed comments about each of the questions in the questionnaire follow.

DETAILED DISCUSSION OF RESPONSES TO INDIVIDUAL QUESTIONS

The results of questions 1 and 2, the ones concerned with product cost and weight, are not very surprising when compared to each other. Most of the companies that make light weight products (under five pounds) also make low cost products. Only 12% of the companies surveyed make light weight products costing $100 or more. The companies in the 5 to 20 pound category fall heavily into the low cost (24%) and medium cost (64%) categories. Products weighing from 20 to 100 pounds are mostly in the medium cost (58%) and costly (26%) categories. Nearly all of the products weighing 100 pounds or more are in the costly and high cost categories. These results follow the common assumption that in most cases the cost of making a product increases as its weight increases i.e., a product that weighs 500 pounds usually costs more to manufacture than a product weighing only 5 pounds.

Questions 3, 4, 5, and 6 are concerned with the percentage of the company's main product's manufacturing costs that are associated with materials. Purchased materials make up an average of 29.3% of the main product's manufacturing costs. Products in the medium weight, costly category have the lowest percentage of purchased materials at 20.4% while the medium weight, medium cost category has the highest percentage, 32.7%. A product's weight and cost do not appear to have a large affect on the amount of purchased materials used in the manufacturing process.

The amount of purchased components used varies greatly depending upon the main product's weight and cost. Purchased components make up 22.9% of the heavy, costly products' manufacturing costs. The percentage is only 8.6% for medium weight, medium cost products; 15.7% for medium weight, costly products; 13.8% for low weight, medium cost products; and 11.3% for light weight, low cost products. The average percentage is 17.1% for all products, but the large variance between product categories reduces the usefulness of this number.

The amount of fabricated components used in the manufacturing process also varies greatly among the five major product categories. The survey defines fabricated components as components "made in-house." Fabricated components make up 20.9% of the light weight, low cost products' manufacturing costs and 27.5% of the medium weight, costly products' manufacturing costs. The low weight, medium cost category percentage is 11.4%, the heavy, costly category 16.5%, and the medium weight, medium cost category is only 4.6%. The medium weight, costly products' fabricated components percentage is approximately 6 times the percentage for medium weight, medium cost products. This large difference may indicate that the use of fabricated components in products as a percent of manufacturing costs tends to increase as the cost of the product increases. The average percentage for fabricated components is 16.9%.

According to the survey, packaging materials costs are, in most cases, a very small percent of a products' manufacturing costs. The average percentage is just 1.6%. The light weight, low cost products have the highest percentage of packaging materials by far at 4.1%. The other four categories all have percentages of 1.0% or less.

Questions 7 through 11 are concerned with the percentage of the company's main product's manufacturing costs that are associated with labor and overhead. The average percentage for direct labor wages is 10.4%, but the medium weight, medium cost; medium weight, costly; and the light weight, low cost categories are all within 0.3% of 12.0%. The low weight, medium cost category has a direct labor wages percentage of 8.7% and the heavy, costly category has a percentage of just 7.9%.

The percentages for direct labor benefits vary greatly. The low weight, medium cost category percentage is 3.7%; the heavy, costly category percentage is slightly smaller at 3.6%. These two percentages are well below the average percentage of 5.9%. Low percentages would be expected for these categories because both have low direct labor wages percentages. The other three

categories all have direct labor wages percentages of approximately 12%. It would be expected that the three categories' direct labor benefits percentages would be close together. Surprisingly the three percentages have a range of 6.10%. The light weight, low cost category has a percentage of 6.6%, the medium weight, medium cost category percentage is 10.8%, and the medium weight, costly percentage is 4.7%. These results mostly support the idea that the direct labor benefits percentage is not directly related to or affected by the direct labor wages percentage.

The indirect labor wages percentages range from 3.7% for heavy, costly products to 8.1% for light weight, low cost products. Low weight, medium cost products have a percentage of 5.3% while Medium weight, medium cost products have a percentage of 7.9%. The medium weight, costly category has a percentage of 4.4% which is similar to the percentage of 3.7% for the heavy, costly products. The overall average is 6.1%. The survey results do not indicate any clear relationships between a product's weight and cost and the percentage of indirect labor wages.

The indirect labor benefits percentages vary from 4.5% for light weight, low cost products to 2.0% for heavy, costly products. Low weight, medium cost products have a percentage of 2.8%, medium weight, medium cost products a percentage of 2.5%, and medium weight, costly products a percentage of 3.4%. These percentages do not support a strong relationship between the amount of indirect labor wages and the amount of indirect labor benefits. For medium weight, costly products the amount of indirect labor benefits is over 75% of the amount of indirect labor wages. The indirect labor benefits/indirect labor wages ratio is only slightly more than 30% for medium weight, medium cost products, however. The other three categories have ratios of approximately 53%, 54%, and 56%.

Question 11 asks the respondent what percent of product costs are manufacturing costs other than direct materials, direct

labor, indirect labor, or employee benefits. In other words, the amount of manufacturing overhead that is not indirect labor or employee benefits. The amount of "other overhead" ranges from 11.4% for heavy, costly products to 19.4% for low weight, medium cost products. The light weight, low cost products have a percentage of 17.5%, medium weight, medium cost products a percentage of 12.4%, and medium weight, costly products a percentage of 13.7%. The overall average percentage for other overhead is 14.6%.

Questions 15 through 20 ask the respondent questions about the composition of the main product's overhead costs. The six questions divide the overhead costs into six areas or groups.

Question 15 asks the respondent what percent of overhead is materials related, including indirect materials and materials handling. The average percentage is 8.1%, but the five categories range from 12.4% for the medium weight, medium cost category to 6.1% for the heavy, costly category. The light weight, low cost category percentage is very close to the heavy, costly category at 6.1%. The medium weight, costly percentage is 10.4%, similar to the medium weight, medium cost category. The only percentage that is relatively close to the average is the low weight, medium cost category's 8.8%. There appear to be no strong relationships between product weight and/or cost and the amount of materials related overhead.

Question 16 asks the respondent what percent of overhead is labor related, including indirect labor, employee benefits, supervision, and training. The average percentage is 25.1% with the medium weight, costly category being the highest at 36.1% and the low weight, medium cost category the lowest at 20.0%. The medium weight, medium cost percentage is 21.2%, the heavy, costly percentage 25.0%, and the light weight, low cost percentage 25.8%. The range between the five categories is 16.1%, which is a significant range, but all five categories' labor related overhead percentages are at least 8.0% higher than the percentages of the other five groups. According to the survey results,

labor related costs are by far and away the largest group of overhead costs.

Question 17 asks the respondent what percent of overhead is equipment related, including depreciation, maintenance, and setup costs. The range in this category was relatively small with the light weight, low cost category percentage the highest at 16.8% and the low weight, medium cost category the lowest at 11.0%. The heavy, costly category percentage is the second lowest at 11.9%. The medium weight, costly category percentage is 14.7% while the medium weight, medium cost category percentage is 13.2%. The average percentage for all five categories is 14.3% and is fairly representative of the categories.

Question 18 asks the respondent what percent of overhead is tooling-related, possibly including amortization or depreciation, expensed tooling, and maintenance. According to the survey results, tooling-related costs is not a large part of overhead costs for any of the five categories. The low weight, medium cost category has the highest percentage at 5.7%. The next highest percentage is 5.4% for the medium weight, costly category. The percentage for the light weight, low cost category is 4.8% and the percentage for the heavy, costly category is 3.7%. The percentage for the medium weight, medium cost category is 2.8%, the lowest of the five categories. The overall average is just 4.2%.

Question 19 asks the respondent what percent of overhead is information-related, including engineering information, production information, and cost accounting information. The overall average is 4.1%, very similar to the average for tooling-related costs. The range for this question is fairly large at 9.3%. The lowest percentage is the medium weight, medium cost category's 1.8% The low weight, medium cost category percentage is 2.8%, the light weight, low cost category percentage 3.2%, and the heavy, costly category percentage is 3.8%. The percentages for these four categories are very close together, but the percentage for the medium weight, costly category is more than twice as much

at 11.1%. Excluding the medium weight, costly category, information-related costs are not a large part of overhead costs according to the survey results.

Question 20 asks the respondent what percent of overhead is facilities related, including costs related to space, conditions, security, and property. The range for this question is very small at 2.9%. The average percentage is 6.8%. The heavy, costly category has the highest percentage at 7.6%, while the low weight, medium cost category has the lowest percentage at 4.7%. The light weight, low cost percentage is 6.6%, the medium weight, medium cost percentage is 5.0%, and the medium weight, costly percentage is 5.4%. Interestingly enough, the medium weight, costly category's percentages for tooling-related costs and facilities related costs are both 5.4%.

WORKS CITED

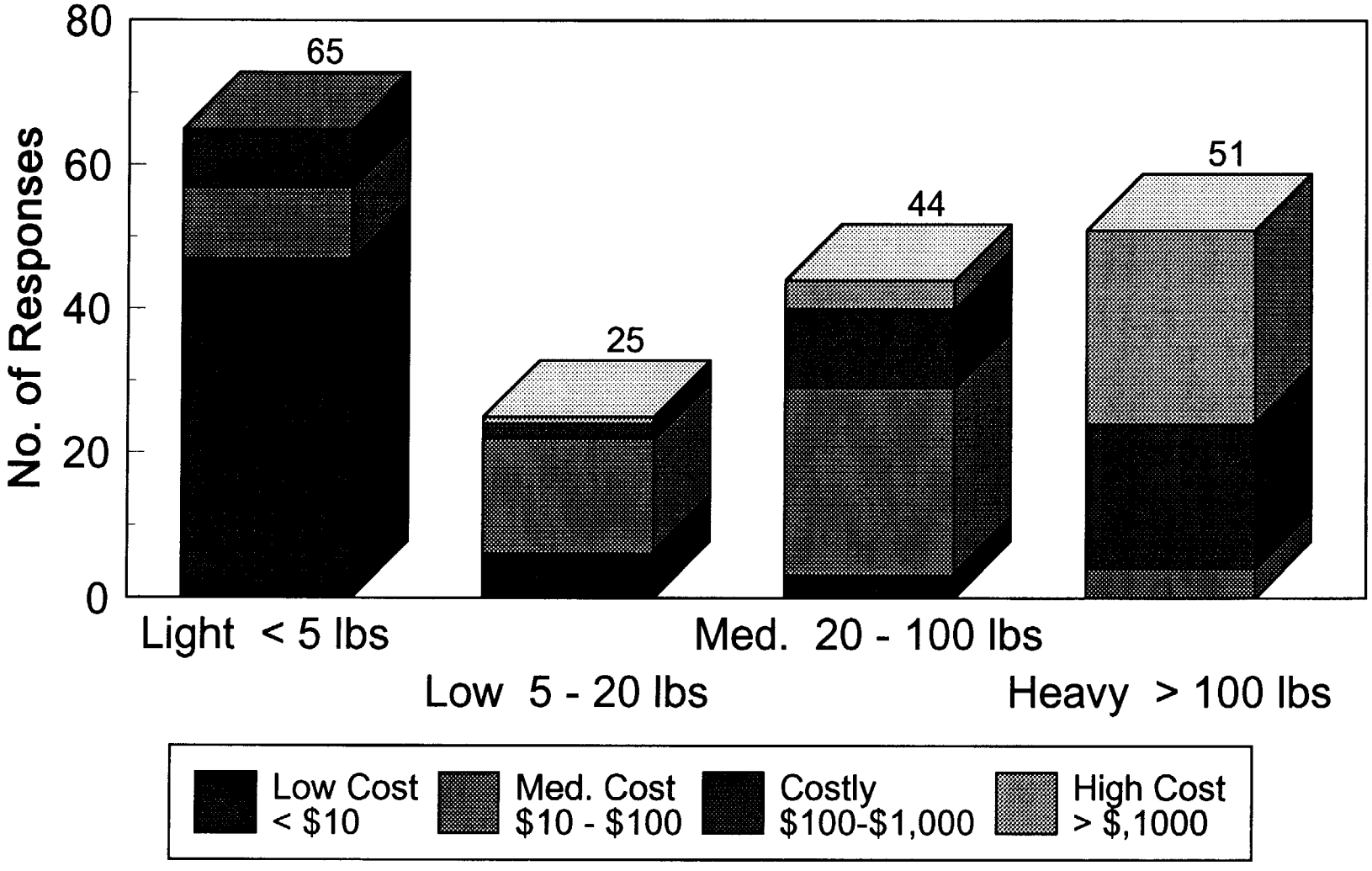
Cooper, R. "The Two-Stage Procedure in Cost Accounting," Journal of Cost Management, Vol 1, No. 2 (Summer 1987), 43-51, and Vol. 1, No. 3 (Fall 1987), 39-45.

Cooper, R. and R.S. Kaplan. "Measure Costs Right; Make the Right Decisions," Harvard Business Review, Vol. 66, No. 5 (Sept-Oct 1988), pp. 96-103.

Gosse, D.I. "Cost Accounting's Role in Computer-Integrated Manufacturing: An Empirical Field Study," Journal of Management Accounting Research, Vol. 5 (Fall 1993), 159-179.

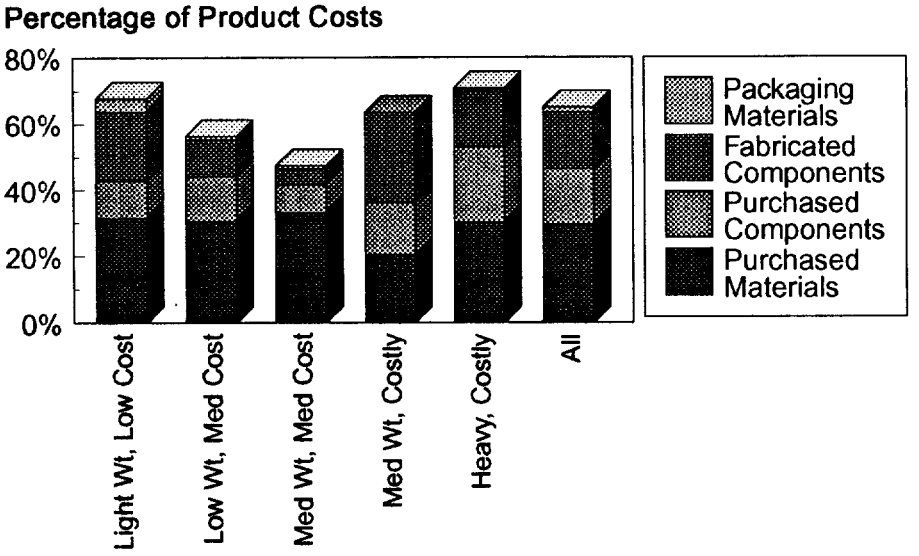
Greenwood, T.G. and J.M. Reeve. "Activity-Based Cost Management for Continuous Improvement," Journal of Cost Management, Vol. 5, No. 4 (Winter 1992), 22-40.

Product Weight and Cost (N = 185)



N=185 09/26/1993

Materials Costs

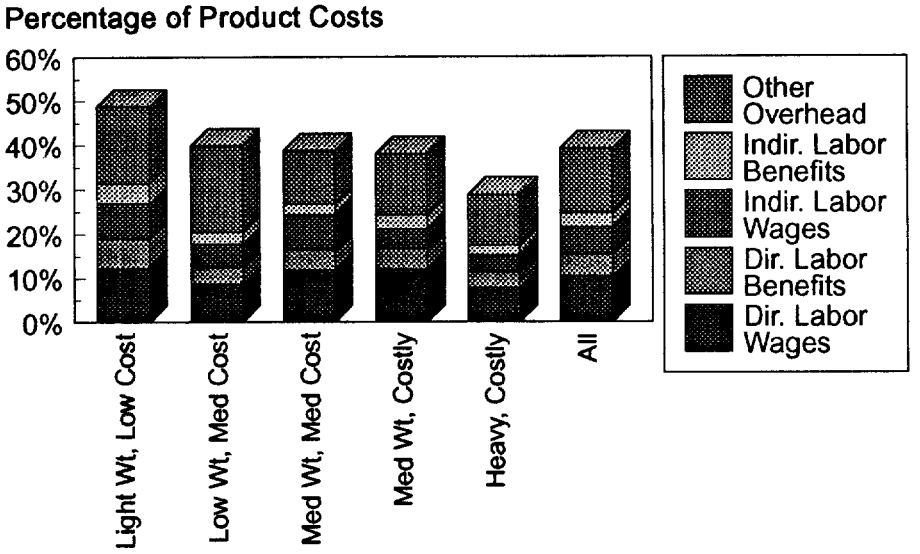


Materials Costs

	Purchased Materials	Purchased Components	Fabricated Components	Packaging Materials
Light Wt, Low Cost	31.4%	11.3%	20.9%	4.0%
Low Wt, Med Cost	30.3%	13.8%	11.3%	0.9%
Med Wt, Med Cost	32.8%	8.8%	4.8%	0.8%
Med Wt, Costly	20.3%	15.7%	27.5%	0.0%
Heavy, Costly	30.0%	22.8%	17.3%	0.7%
All	29.3%	17.1%	17.0%	1.6%

N=185

Labor and Overhead Costs

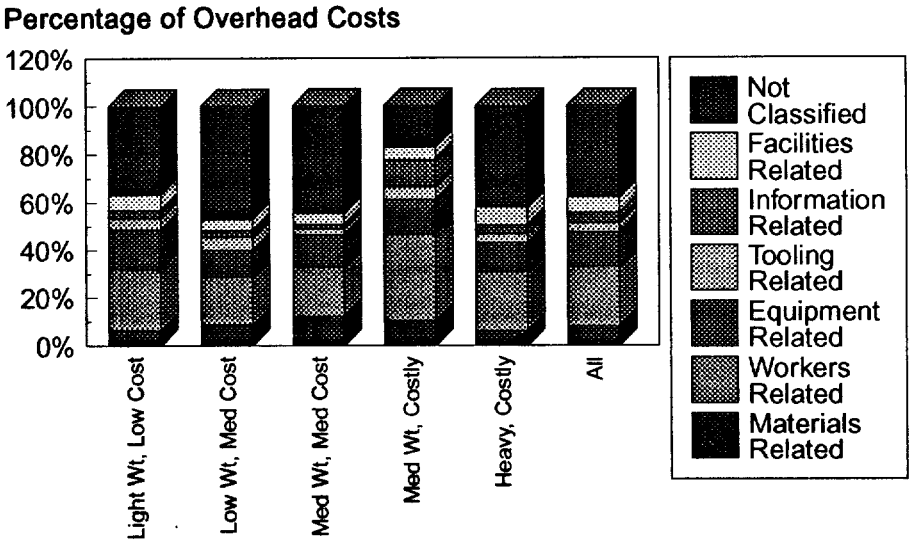


Labor and Overhead Costs

	Dir. Labor Wages	Dir. Labor Benefits	Indir. Labor Wages	Indir. Labor Benefits	Other Overhead
Light Wt, Low Cost	12.2%	6.6%	8.1%	4.5%	17.4%
Low Wt, Med Cost	8.7%	3.7%	5.3%	2.8%	19.4%
Med Wt, Med Cost	11.8%	4.6%	8.0%	2.4%	11.9%
Med Wt, Costly	12.0%	4.7%	4.3%	3.3%	13.7%
Heavy, Costly	7.8%	3.5%	3.9%	2.3%	11.4%
All	10.3%	5.0%	6.1%	3.2%	14.5%

N=185

Composition of Overhead Costs



Composition of Overhead Costs

	Materials Related	Labor Related	Equipment Related	Tooling Related	Information Related	Facilities Related	Not Classified
Light Wt, Low Cost	6.2%	25.8%	16.8%	4.8%	3.2%	6.6%	36.6%
Low Wt, Med Cost	8.8%	20.0%	11.0%	5.7%	2.8%	4.7%	47.1%
Med Wt, Med Cost	12.1%	21.0%	13.3%	2.7%	1.8%	4.8%	44.5%
Med Wt, Costly	10.4%	36.1%	14.7%	5.4%	11.1%	5.4%	17.2%
Heavy, Costly	6.1%	25.0%	11.9%	3.7%	3.8%	7.6%	42.0%
All	8.0%	25.2%	14.3%	4.1%	4.1%	6.7%	37.8%

N=185

Ball State University

College of Business
Department of Accounting

(317) 285-5113
FAX: 285-8024

Darrel I. Gosse, CPA, Ph.D.
Assistant Professor

A study of the composition of factory overhead in Indiana manufacturing companies

We are interested in updating our instructional case materials on cost accounting and we want to be sure we are using reasonably authentic information to help make the cases realistic. In that connection, we have selected a sample of companies to ask for descriptive information about the composition of their overhead costs. Please consider and answer the questions listed below by checking ✓ the box for your answer. Only about 10 minutes of your time should be required to answer the questions. *Your answers are important to us and we thank you for your contribution.* A postage-paid envelope is enclosed for your reply, which should be returned to:

Mr. Kenneth Diggs
Bureau of Business Research
College of Business
Ball State University
Muncie, IN 47306-9987

All the questions refer to your firm's main product only. If your firm has several main products, then please use the product that generates the most sales revenues.

1. For your main product, what is the product's shipping weight per unit?

☐ Under 1 lb. ☐ 1 up to 5 lbs. ☐ 5 up to 10 lbs. ☐ 10 up to 20 lbs.
☐ 20 up to 50 lbs. ☐ 50 up to 100 lbs. ☐ 100 up to 500 lbs. ☐ Over 500 lbs.

2. What are the total *manufacturing* costs per unit to <u>produce</u> your main product as a finished good?

☐ Under $10 ☐ $10 up to $100 ☐ $100 up to $500
☐ $500 up to $1,000 ☐ $1,000 up to $5,000 ☐ $5,000 up to $10,000
☐ $10,000 up to $20,000 ☐ $20,000 up to $50,000 ☐ Over $50,000

Questions 3 - 12 are concerned with the proportionate cost composition of the costs per unit referred to in question 2.

3. What percent of the product's manufacturing costs are *purchased* <u>raw materials</u>?

☐ less than 5% ☐ 5% up to 10% ☐ 10% up to 15% ☐ 15% up to 20%
☐ 20% up to 25% ☐ 25% up to 30% ☐ 30% up to 35% ☐ 35% up to 40%
☐ 40% up to 45% ☐ 45% up to 50% ☐ 50% up to 55% ☐ 55% up to 60%
☐ 60% up to 65% ☐ 65% up to 70% ☐ 70% up to 75% ☐ 75% or more: _____

4. What percent of the product's manufacturing costs are *purchased* <u>components</u>?

☐ less than 5% ☐ 5% up to 10% ☐ 10% up to 15% ☐ 15% up to 20%
☐ 20% up to 25% ☐ 25% up to 30% ☐ 30% up to 35% ☐ 35% up to 40%
☐ 40% up to 45% ☐ 45% up to 50% ☐ 50% up to 55% ☐ 55% up to 60%
☐ 60% up to 65% ☐ 65% up to 70% ☐ 70% up to 75% ☐ 75% or more: _____

5. What percent of the product's manufacturing costs are *fabricated* components ("made in-house")?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

6. What percent of the product's manufacturing costs are packaging materials?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

7. What percent of the product's manufacturing costs are gross pay (excluding employee benefits -- see the next question) for direct labor?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

8. What percent of the product's manufacturing costs are employee benefits for direct labor?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

9. What percent of the product's manufacturing costs are gross pay (excluding employee benefits) for indirect labor?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

10. What percent of the product's manufacturing costs are employee benefits for indirect labor?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

11. What percent of product costs are manufacturing costs other than: direct materials, direct labor, indirect labor, or employee benefits?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

12. The preceding questions focused on the costs of manufacturing a product. Of course the *total* costs of a product include additional shipping and selling costs. Assuming "Total Product Costs" are defined as [manufactured costs + direct shipping and/or selling expenses], what percent of *your* "Total Product Costs" are direct shipping and/or selling expenses?

☐ less than 5% ☐ 5% up to 10% ☐ 10% up to 15% ☐ 15% up to 20%
☐ 20% up to 25% ☐ 25% up to 30% ☐ 30% up to 35% ☐ 35% up to 40%
☐ 40% up to 45% ☐ 45% up to 50% ☐ 50% up to 55% ☐ 55% up to 60%
☐ 60% up to 65% ☐ 65% up to 70% ☐ 70% up to 75% ☐ 75% or more: _____

Questions 13 - 20 focus on "overhead" costs, which we define as: *the product's manufacturing costs - [direct materials (or components) and direct labor wages].*

13. At what level is your firm's production overhead rate applied?

☐ Factory level ☐ Department level
☐ Activity level ☐ Machine level
☐ Other (Please specify) _____

14. What application base is used for the overhead rate?

☐ Direct labor hours ☐ Direct labor dollars ☐ Machine hours or usage
☐ Other (Please specify) _____
If more than one base is used, please explain:

_____
_____

15. What percent of overhead is *materials*-related, such as indirect materials or materials handling, etc.?

☐ less than 5% ☐ 5% up to 10% ☐ 10% up to 15% ☐ 15% up to 20%
☐ 20% up to 25% ☐ 25% up to 30% ☐ 30% up to 35% ☐ 35% up to 40%
☐ 40% up to 45% ☐ 45% up to 50% ☐ 50% up to 55% ☐ 55% up to 60%
☐ 60% up to 65% ☐ 65% up to 70% ☐ 70% up to 75% ☐ 75% or more: _____

16. What percent of overhead is *worker*-related, such as indirect labor, employee benefits, supervision, training, etc.?

☐ less than 5% ☐ 5% up to 10% ☐ 10% up to 15% ☐ 15% up to 20%
☐ 20% up to 25% ☐ 25% up to 30% ☐ 30% up to 35% ☐ 35% up to 40%
☐ 40% up to 45% ☐ 45% up to 50% ☐ 50% up to 55% ☐ 55% up to 60%
☐ 60% up to 65% ☐ 65% up to 70% ☐ 70% up to 75% ☐ 75% or more: _____

17. What percent of overhead is equipment-related (includes depreciation, setup costs, maintenance, etc.)?

☐ less than 5% ☐ 5% up to 10% ☐ 10% up to 15% ☐ 15% up to 20%
☐ 20% up to 25% ☐ 25% up to 30% ☐ 30% up to 35% ☐ 35% up to 40%
☐ 40% up to 45% ☐ 45% up to 50% ☐ 50% up to 55% ☐ 55% up to 60%
☐ 60% up to 65% ☐ 65% up to 70% ☐ 70% up to 75% ☐ 75% or more: _____

18. What percent of overhead is *tooling*-related, such as amortization or depreciation, expensed tooling, maintenance, etc.?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

19. What percent of overhead is *information*-related, such as engineering information, production information, cost accounting information, etc.?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

20. What percent of overhead is *facilities*-related costs related to space, conditions, security, property, etc.?

☐ less than 5%	☐ 5% up to 10%	☐ 10% up to 15%	☐ 15% up to 20%
☐ 20% up to 25%	☐ 25% up to 30%	☐ 30% up to 35%	☐ 35% up to 40%
☐ 40% up to 45%	☐ 45% up to 50%	☐ 50% up to 55%	☐ 55% up to 60%
☐ 60% up to 65%	☐ 65% up to 70%	☐ 70% up to 75%	☐ 75% or more: _____

21. Did questions 15 - 20 cover most, if not all, of your overhead costs? If not, please list and explain below.

_____

_____

_____

THANK YOU FOR YOUR TIME! *Please return your survey in the postage paid envelope provided.*