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## **THE DEVELOPMENT OF MANAGERIAL ACCOUNTING IN GERMANY: A HISTORICAL ANALYSIS**

*Abstract:* During the second half of the nineteenth century, managerial accounting development in Germany was based on micro-economic theory. In the twentieth century, the emphasis shifted to techniques and later to determination of "true cost", resulting in a highly developed system that had a major impact on other European countries. The major difference between the German developments and those in the USA is the separation of cost (consumption/utilization of physical resources) from expenses. After WWII, interest centered on cost theory based on limitational rather than substitutional production functions. Gutenberg demonstrated various cost adaptation patterns as managements responded to output changes and created a sophisticated theory using indirect rather than direct output/cost relationships. This theory is little known in the USA and might stimulate theory research, particularly in the area of activity costing.

Managerial accounting as a tool for management decision making in Germany is closely tied to the development of accounting in general. In analyzing its development, it will be necessary to refer to financial accounting occasionally. To show distinctive steps in managerial accounting development, several periods will be analyzed: these include (1) the time before 1900, (2) the period of early academic efforts until the mid-1930s, (3) the period of government standardization and control until 1945, and (4) the period after WWII leading up to today's decision-oriented management accounting. Since this paper addresses an audience familiar with USA managerial accounting practice, only a survey is given and differences rather than common ground will be emphasized to show the developments in Germany, which are independent — at least to a certain extent — of USA approaches.

## MANAGEMENT ACCOUNTING BEFORE 1900

### *Cost Behavior Analysis*

As long as merchants have kept records, their concern has been to relate expenses to certain activities and to determine how much profit has been made with each transaction. Initially, this was regarded as a secret procedure and carefully guarded. Early on, it was realized that expenses might decline with growing quantities. As Schneider [1981] points out, these ideas can be found as early as 1613 in the writings of Antonio Serra, and later Adam Smith and others. In the German accounting literature, May [1770] mentions “disproportionate” overhead (*disproportionirte Unkosten*) and Leuchs [1804] divided acquisition expenses into sales-related and independent (presumably “fixed”) costs. On the other hand, economists concerned with agriculture, such as Turgot, Thuenen, and others, pointed out that increasing efforts do not necessarily yield larger returns, thus laying the foundation for increasing marginal cost as a cost behavior pattern. It is, therefore, safe to assume that the distinction between different classes of costs has been used much earlier than most nineteenth century authors claim.

### *Differentiation of Internal and External Accounting*

The differentiation between financial and factory accounting records has been traced to the end of the fourteenth century by Penndorf [1930]<sup>1</sup>; it becomes more frequently mentioned as the result of industrialization in the late eighteenth century [Klipstein, 1781; Jung 1786; and Fredersdorff 1802]. At this time, the terms “*Fabrickbuchhaltung*” (factory accounting) and “*Handlungsbuchhaltung*” (financial accounting) were being introduced. Factory accounting consisted of determining how much was spent on the merchandise or product and for how much it had to be sold to make a profit. Practical examples, however, remain rare because the attitude of secrecy still prevailed. The first comprehensive description of a price determination system (*Kalkulation*) is attributed to Ballewski [1877], who also deals with the issue of cost behavior at different output levels. This is soon reinforced by Tolkmitt’s [1894] discussion of the central role of costing for all

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<sup>1</sup>Penndorf reports on an Italian approach from 1395, which parallels closely today’s manufacturing account. This is based on material at least one century older than Luca Pacioli’s treatment of accounting, although he does not mention such approaches.

forward looking management decisions. Dorn [1976] describes all these attempts as a preliminary stage of cost accounting; most publications contain substantial details and give technical advice on how to handle certain procedures, but none systematizes the material nor attempts to critically evaluate procedures found in various businesses.

## MANAGEMENT ACCOUNTING DURING THE PERIOD 1900-1933

### *General Trends*

Increasing industrialization along with the recognition of business as an academic subject (business schools were founded in Leipzig and Cologne in 1898) focused interest on the issue of cost determination. The first major systematic analysis was published by Leitner in 1905. A complete description of the system used by a well known company appeared in 1907 [Lilienthal]; the Association of German Equipment Manufacturers (VDMA) surveyed procedures of an entire industry and published these results in 1908. All these publications concentrated on procedural and technical aspects. In addition, the causation principle, the recommended bases for allocation of overhead among departments, and the redistribution of costs to products were discussed. It is interesting to note that already at this time the viability of labor cost as an allocation basis was questioned [Bruinier, 1908].

Initially, internal and external accounting were viewed as a continuous flow through the company and thus a unified system. Much of the material published was not very different from cost accounting procedures still discussed in modern text books.

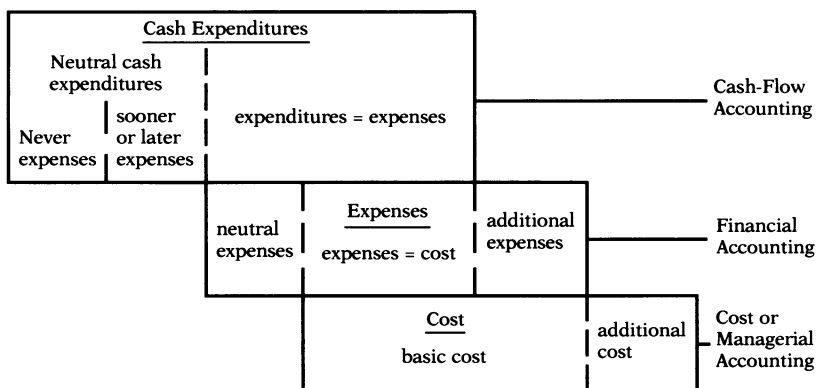
### *Separation of Expenses and Cost*

It was Schmalenbach, then a dominant figure in academia who made several suggestions that later had a major impact on practical accounting. His major conceptual contribution was the argument to clearly distinguish between *cash expenditures*, *expenses*, and *costs*. He observed that accountants should not only observe the well known distinction between cash flows and expenses by allocating expenses according to the matching concept, but that cost should represent a summary of real resource input quantities (rather than money) into the production process. By not separating cost from expenses, traditional accounting — particularly under inflationary circumstances — is unable to establish a basis for pricing of products. If, however, consumption of goods

are represented in the internal accounting process, values (prices) for cost may be introduced at a later date (e.g., at the time of sale). Under such circumstances, financial accounting expenses and costs will differ. The relationship of Schmalenbach's three categories is shown in Exhibit 1.

### Exhibit 1

#### Relationship Between Expenditures, Expenses and Costs [Schoenfeld, 1974]



He sees the discrepancies between expenses and costs as caused by (1) temporal differences and (2) material differences. Temporal differences are introduced by different usage assumptions underlying depreciation (frequently linear in financial accounting, but preferably usage-based in costing and thus potentially chargeable to other time periods; both will eventually result in the same total, if calculated from acquisition cost). Other temporal differences are triggered by delayed repairs and overhauls; if not recorded in the period when they were caused, then cost may be understated for a time and overstated when these items lead to chargeable expenses (resulting in cost fluctuation in spite of the fact that 'real' costs remained the same and were only delayed). Obviously, such ideas will raise objections from U.S. accountants, because they may create a possibility for income smoothing. Nevertheless, if assessed strictly in terms of actual resources consumed for manufacturing and classified as a necessary part of prices for cost recovery, such items should be allocated to periods in which they were caused.

Even more important are material differences, which may fall into two classifications: (a) expenses which will never become cost or vice versa, and (b) costs that are different from expenses due to

different accounting (valuation) bases. These require some illustration. There are business activities not connected with manufacturing, such as speculation, financing and other activities, which are not part of the company's usual business purpose. Although nobody would dispute their nature as business expenses, these items do not represent purpose-oriented consumption of resources — thus they should never become costs of a specific product and should be recovered separately from gross profits. These items are Schmalenbach's "(cost) neutral expenses". Conversely, there is the possibility of resource consumption — such as the use of equity capital — not reflected in financial accounting expenses. He recommends to record such items as "imputed cost" and be added to total cost to measure 'true' resources used for manufacturing. Other examples are self-insurance "premiums" and management efforts by owner(s) in private enterprises for which no salaries are paid. Schmalenbach insists on the need to adjust expenses before these will represent actual input consumption and can be regarded as cost [Schmalenbach, 1925].

#### *Uniform Systems of Accounts*

It is again Schmalenbach [1927] who contributes to the development of managerial accounting in his work concerning uniform systems of accounts. He views managerial accounting as representing internal transfers and transformations which are imbedded into the external transactions of an enterprise: consequently, all internal transactions should be shown as an integral — but separate — part of the accounting system. Based on this concept, he recommends a set of accounts, which at the same time provide for internal control and external reporting. Such a system has to account for any adjustments needed to properly measure expenses and cost as defined above. This view prevailed in the following period and became an integral part of government imposed accounting requirements (details discussed below).

#### *Other Issues*

During this same period several other issues emerged, such as attempts to improve the accuracy of the costing system by standardizing terminology, improving the definition of cost centers and breaking these down into their smallest units (*Platzkostenrechnung* = accounting for work stations). Even early developments of standard costing (*Plankostenrechnung*) emerged. At the same time hyper-inflationary developments triggered de-

mands for “up-to-date valuation” of costs (easily accomplished, if original data are simply regarded as quantity measurements, to which new prices assuring the maintenance of the physical substance are attached). It is by-and-large the work of Schmidt [1923], which brings out these aspects (eventually resulting in the Dutch use of reproduction values). Schmalenbach’s imputed cost procedures facilitated the integration of such adjustments in the regular accounting system. It should be noted, though, that Schmalenbach himself never agreed to the use of reproduction cost — he rather settled for indexing, because he regarded inflation as an abnormal rather than a normal development.

### MANAGEMENT ACCOUNTING DURING THE PERIOD 1933-1945

#### *Accounting and Pricing Regulations*

This period with its disastrous political developments had a strong effect on accounting, because rather than nationalization of industry, the German government chose indirect control of industry as the route towards a government controlled economy. This resulted in a codification of prior ideas to develop measurement procedures and thus assured comparable data for controlling all segments of the economy. The major regulatory measures (passed as decrees) were the following:

- (1) *Wirtschaftlichkeitserlass* (efficiency decree) of November 11, 1936;
- (2) *Buchfuehrungsrichtlinien* (accounting guidelines) of November 11, 1937;<sup>2</sup>
- (3) *Leitsaetze fuer die Preisermittlung aufgrund der Selbstkosten bei oeffentlichen Auftraegen [LSÖ]* (pricing guidelines for all public contracts) of November 15, 1938;
- (4) *Kostenrechnungsgrundsaeetze [KRG]* [Fischer et al., 1939] (cost accounting guidelines) of January 16, 1939.

The Decree of November 11, 1937 prescribed the organization of accounting systems, made the adoption of the *Uniform Charts*

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<sup>2</sup>*Grundsaeetze zur Organisation der Buchfuehrung im Rahmen eines einheitlichen Rechnungswesens* regulated accounting procedures for companies by size. All accounting records had to be based on the mandatory Uniform System of Accounts (*Kontenrahmen*) prescribed for each ‘Group of Industry’ to which a company was assigned. Standard Uniform charts of accounts could be enlarged by adding accounts through extension of digits in the numbering system; this provision kept the system flexible.

of *Accounts* mandatory, and specified a fourfold purpose, which had to be met by every accounting system:

- (1) accounting and financial statements (accounting for period results),
- (2) cost accounting (accounting for pricing and per unit valuation),
- (3) business statistics (for internal and external comparison), and
- (4) planning (projection for future periods).

Requirements #2 particularly, introduced major changes into German accounting practice by mandating the use of imputed cost items and tying financial and managerial accounting together into one system.

#### *The Impact of Government Regulations on Cost Accounting*

The new system was designed to accomplish measurement at the individual business and the overall economic level at the same time. It adopted a strict input resource consumption definition for costing, as proposed by Schmalenbach. For example, interest expenses paid to third parties were no longer regarded as sufficient to measure cost. Instead capital utilization — regardless of source — for a certain process became the accepted definition because it measured efficient input factor utilization in a single firm as well as in an overall economic context. These requirements were regarded as minimal comparative information, to provide “true” performance-based guidance for entrepreneurial and governmental decisions. Comparative data required that the standardization of all cost measures which might cause differences similar to those in financing (borrowed versus equity capital), legal organization (corporation v. sole proprietorship), asset utilization patterns (systematic balance sheet depreciation v. machine-usage-based consumption), and specific — often uninsurable — risks. Four new groups of imputed cost were introduced to assure this standardization:

- (1) imputed management salaries,
- (2) imputed interest,
- (3) imputed depreciation, and
- (4) imputed risk charges [Fischer et al., 1942, pp. 266-304].

Uniformly all actual expenses requiring adjustments were debited to “neutral” expense accounts in class 2. At the same time,



these items (often with different values) were debited to imputed cost accounts in class 4 and credited to separate accounts in class 2. Since the accounts of classes 4 and 2 — after some intermediate steps — were closed out to the income statement, original and adjusted entries remained traceable, neutralizing each other before financial accounting profits were calculated. By routing manufacturing cost including imputed cost through a special “*Betriebsergebnis*” (operations) account, the procedure remained transparent (for details of the procedures used see Schoenfeld, 1974, p. 31).

The principle of a single write down to zero was maintained for depreciation in financial accounting, using (largely tax based) guideline lives, whereas for costing purposes other procedures (such as output related depreciation or a valuation basis different from financial records) were admissible; inflationary developments in some or all cost items could easily be accommodated — as well as delayed repairs and similar events. Over- or underestimation of actual life spans were treated as a special depreciation risk.

#### *Separation of Specific Cost Items*

The system attempted to measure “normal” manufacturing cost, and to separate cost items occurring only in connection with specific orders [*Sondereinzelkosten und Sonderkosten*; Funk, 1937, pp. 50-5]. Normal cost were defined in relationship to capacity utilization and corresponded to practical capacity. However, the system was geared towards actual rather than standard costing. It also prescribed specific steps for overhead cost allocation and distribution (at normal capacity).

In determining the admissible capital usage charge, the notion of “required capital” (*betriebsnotwendiges Kapital*) was developed, which assumed the possibility of assessing capital needs for certain types of production (established by comparison on an industry-wide basis). This idea may even today offer some interesting possibilities to compare actual capitalization with a “most efficient” procedure, although it is admittedly difficult to determine optimal levels.

In addition to accounting standardization, the system provided pricing guidelines for all government orders (*LSÖ — Leitsätze fuer die Preisbildung bei öffentlichen Aufträgen*). For this purpose a general costing scheme shown in Exhibit 2 was adopted.

**Exhibit 2****Cost Accumulation Steps for Pricing  
[Schoenfeld, 1974]****Materials (*Stoffkosten*)**

Direct Material

+Material Overhead

+Processing Cost (*Fertigungskosten*)

+Direct Wages

+Overhead (percentage of wages, preferably separate for all participating production departments)

+Specific Processing Cost (only if costs exist which are related to individual products or orders)

+Research and Development Cost (*Forschungs- und Entwicklungskosten*)

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**=Total Manufacturing Cost (*Herstellkosten*)**

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+Administrative Cost (*Verwaltungskosten*)+Marketing Cost (*Vertriebskosten*)

+Special Marketing Costs (such as taxes and commissions)

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**=Total Cost to Company (*Selbstkosten*)**

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In order to keep records at a comparable level reflecting all typical cost, special cost items (*Sondereinzelkosten*) were not routed through regular accounts but treated as items chargeable directly to the special orders or products. The *LSÖ* also represented improvements with respect to the separation of materials overhead from general production overhead.

*Systematization of Cost Accounting*

The application of all requirements incorporated in the decrees resulted in a systematic partitioning of the managerial accounting into three major parts, namely

- (1) cost accumulation (*Kostenartenrechnung*), for purposes of cost classification and adjustments,
- (2) cost distribution to consuming departments according to the causation principle or established distribution ratios (*Kostenstellenrechnung*), which can be seen as the major departmental control procedure, and
- (3) cost allocation to products, jobs, or output batches (*Kostentraegerrechnung*) for purposes of pricing.

This approach is still maintained in all textbooks and costing regulations. It can also be found in most other European and in East Bloc countries (with the modifications required by political doctrine).

## MANAGEMENT ACCOUNTING AFTER 1945

### *Voluntary Continuation of Costing System*

After the end of the war invalidated all previous government measure, the Association of German Manufacturers (*Bundesverband der Deutschen Industrie*) reissued its own voluntary recommendations between 1949 and 1951 (*Grundsätze*), which retained the same rules; however, instead of acquisition cost, the new system permits revaluation at market price levels. Practically all German companies use this system or some variation. Such widespread voluntary usage by industry of systematical cost accounting can be taken as an indication that the underlying concepts of the system are regarded as theoretically sound and not merely the results of government control.

The only challenge to the strict resource consumption definition of cost emerged after WWII. The so-called “pagatoric cost view”, that is, a payment-based cost definition which would not classify inputs as cost if these had been acquired for free or are priced different from the actual payments (such as inflation adjustments), was propagated by Koch. The “pagatoric” view objects to the hypothesis, that “resources are acquired at the day of consumption” rather than at the real acquisition date and, therefore, defines costs similar to financial accounting expenses. This view was never accepted by German business practice.

With the re-introduction of a market economy, two distinct trends developed in managerial accounting. First, the research emphasis changed from measuring “true cost” for purposes of a cost-plus pricing to the development of decision tools. During the following 40 years, the emphasis on decision-making tools was gradually shifted from short-term to long-term strategic decision-making. Second, management accounting followed the prevailing trend in business administration theory from a mere interpretation of government rules towards a science of ‘optimal’ behavior of business entities in a free market. As a consequence, managerial accounting turned towards the empirical and theoretical study of cost behavior and the analysis of specific cost items to guide firms towards profit maximization. However, the German development focused specifically on theory rather than practical procedures.

### *Trends Emerging from Decision Making Emphasis*

Initially, traditional absorption costing was replaced with a direct costing view. As it turns out, that did not constitute a real innovation because Schmalenbach [1899] had already suggested

the use of direct cost in 1899. His idea was strongly reinforced by the assimilation of direct costing concepts from the USA which were somewhat changed by introducing multiple levels of cost influencing factors (rather than assuming that variable cost were exclusively output dependent) by Riebel [1961]. He developed the distinction between direct and indirect cost by introducing a hierarchy of allocation bases, for which contribution margins should be measured. This required the definition of direct cost at several levels; direct costs are measured with respect to output, departments, lot size, time consumption etc. Depending on the allocation basis used, some cost items change from direct to indirect. This approach enables management to define and utilize more than one 'contribution' margin to analyze its decisions, thus gaining deeper insights into the behavior of all indirect cost.

Another development — often overlooked — is the work of Schnutenhaus [1948]; he suggests that certain types of fixed cost are not allocable, because these are only related to (caused by) future products and activities ("survival cost" such as R&D and similar items). He, therefore, recommends as the only logically possible basis for their distribution short-term (specific activity) or long-term (present volume or profit) survival contributions of existing products or activities. This method is currently practiced by many high-tech manufacturers. Earlier and more widespread recognition of this classification would have made decades of futile discussions about overhead allocation partially unnecessary.

Another development is the incorporation of standard costing. Initially standard costing was adopted as it existed in the USA. Subsequently, attempts were made to develop this system into what is known today as "double" or "multiple" flexible standard costing. Instead of tracing cost behavior to volume as the only independent variable, systems emerged which incorporated additional independent cost influencing factors such as lot size, production program, processing techniques, routing, input factor quality, processing speed, and other technological criteria. This produces a substantial number of new variances, which require analysis of their significance before being included into practical systems [Kilger, 1981].

Since the end of the 1970s, it was recognized, that overly emphasizing a short-term orientation might create misinformation for strategic purposes, especially as far as pricing is concerned. Particularly, capital-intensive technologies render the traditional managerial accounting system inadequate and required new approaches. Indirect cost had to be remeasured and allocated

to various activities encompassing more than one cost center. This approach permits not only a separate efficiency measurement for activities but also the definition of typical 'activity cost' for the allocation of cost to products [Berkhoff et al., 1983; Waescher, 1987]. These new procedures eventually lead to the identification of cost drivers — as presently discussed in the U.S. literature. The process/activity costing approach has been applied by many German firms since the 1970s. It was facilitated by Riebel's "relative" direct costing approach (mentioned above), and the development of multiple flexible standards in standard costing. These changes were partially caused by the in-depth analysis of production and cost theory resulting from Gutenberg's contributions.

The rediscovery of market prices gave rise to the question whether such market mechanism could also be applied for global optimization purposes in firms with decentralized decision making. Again, it was the pioneering work of Schmalenbach on transfer pricing which led to the adoption of procedures utilizing alternatively market prices, variable cost and shadow prices.

#### DEVELOPMENTS IN COST THEORY

On the conceptual level — referred to as "cost theory" in the German literature — several major post-war developments should be noted. Traditionally, scholars recognized the "law of diminishing returns" (*Ertragsgesetz*) and derived their cost hypotheses from these ideas, resulting in the assumption of an S-shaped cost curve (as used in microeconomics). Due to lack of empirical evidence, the accounting literature frequently replaced this notion with the simplifying assumption of straight line break-even point analysis. In 1950, Gutenberg [1983] re-examined this approach. He coined the term "production function of type A" for traditional S-shaped approaches and explained different — empirically observed — types of cost behavior. His analysis was based on the earlier observation by J. Deans, which were not pursued any further in the USA. He called his approach "production function of type B."

##### *Production Function of Type B*

Gutenberg dispenses with the assumption of peripheral substitution of production factors and replaces it with the observation that in real life 'limitational' production conditions prevail. Under these circumstances, a direct cost-output relationship does not exist. Therefore, no singular production cost or cost function can be defined. The analysis of cost behavior is possible only by studying

the consumption of production (that is, input) factors, which in turn are governed by the technology employed, such as existing equipment or processes. To summarize his approach in non-mathematical terms, Gutenberg elaborates on a multi-stage production function from which appropriate cost functions may be derived. He classifies input factors as consumable (traditional variable cost such as material which is directly output dependent) and "potential" factors (machines, processes, or production cells which were treated as a combination of fixed, semi-fixed and variable overhead). In addition he recognizes a "dispositive" factor, that is management actions. According to him, the output of a single "aggregate" (e.g. machine or self-contained production unit) basically depends on three variables:

- (a) the economic consumption function for all input factors related (that is influenced) by this aggregate;
- (b) the economic performance in a given time period (by-and-large operating speed called "intensity");
- (c) the utilization time of a given "aggregate".

#### *Cost Adaptation to Changing Output Demands*

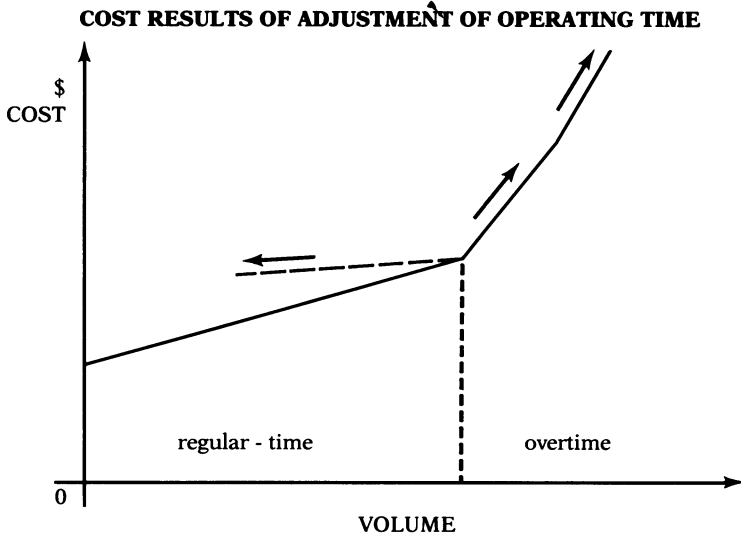
These conditions are the starting point of his hypothesis. The basic idea is that costs do not vary automatically with output levels, but are influenced by management's decisions responding to different demands for output. It is evident that the following options are available for such a response: (1) adaptation of operating time, (2) adaptation of operating intensity, and (3) adaptation of the quantity of input factors.

(1) If the quality and quantity of input factors (so-called potential factors) is assumed to be fixed for the period of observation, then the company is able to respond by adjusting usage time (overtime, reduced shifts etc.) or by changing intensity of usage (faster or slower machine runs). This will lead to progressive cost, once normal capacity is exhausted. The types of cost behavior resulting from these adaptations are shown in Exhibit 3.

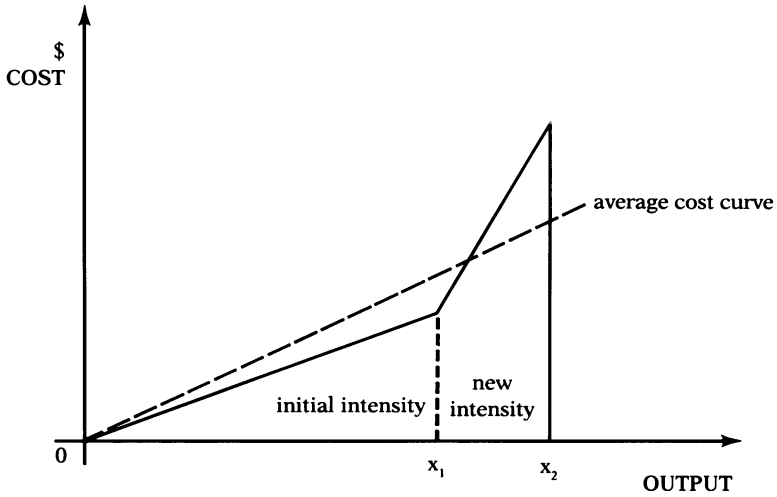
(2) A quantitative adaptation occurs, when the quantity of aggregates (machines, employees) is adjusted. This may be done either on a short-term or a long-term basis. Total cost will increase/decrease following these actions; resulting per unit cost in case of capacity increases will depend on whether new aggregates will be fully used or remain partially idle. In case of capacity reductions, costs depend on whether aggregates will remain or will be sold (Exhibit 4).

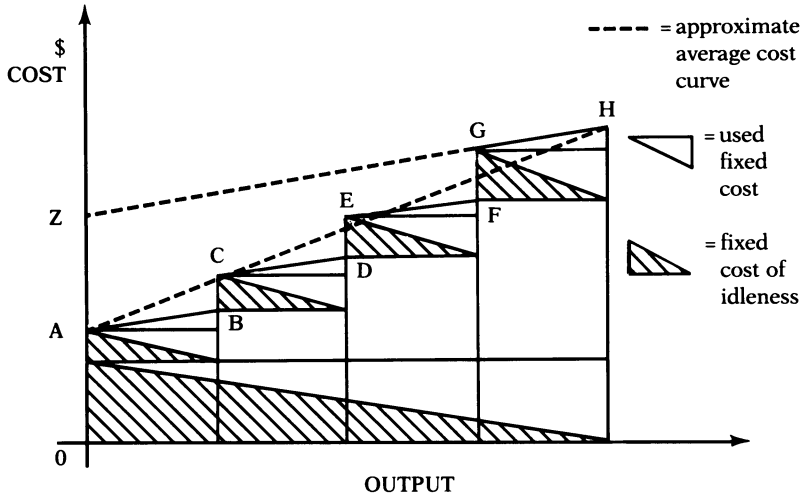
**Exhibit 3**

**Cost Behavior Resulting from Adaptations to Different Output Levels (Gutenberg's Theory)**



**APPROXIMATION OF COST CURVE AFTER INTENSITY ADAPTATION**



**Exhibit 4****COST DEVELOPMENT IN CASE OF QUANTITATIVE  
(CAPACITY) ADAPTATION**

(3) Other forms of adaptation result whenever there is a change in the qualitative combination of input factors. Since lower quality of input factors (which are utilized last, because management prefers to use its best available resources first) results in higher cost, the emerging cost curve tends to be progressive in case of output increases. In case of decreases, it should reduce quickly, whenever there is a possibility to reduce utilization of low quality input factors.

If there is a permanent increase of capacity, usually new technologies and improved (or different) qualities of input factors will be employed. This will result in a so-called mutative adaptation, which establishes an entirely new cost level.

Gutenberg's theory obviously explains reality much better than earlier hypotheses, because it accounts for the fact that a given output does not necessarily result in a single cost function, but can be accomplished by several different input combinations. It also shows how and to what extent management is able to influence cost. However, it also has to be admitted that it may not always be possible to make an accurate prediction of cost levels, because of remaining practical measurement problems.



*Production Function of Type C*

Gutenberg's approach was utilized by practically all German scholars in the following decades, resulting in further sophistication by Heinen [1965] and others, who extended his analysis. Heinen — calling his "production function type C" — wants to go beyond Gutenberg's approach by using so-called "elementary input factor combinations" which measure basic segments of the production process in substantial detail by empirical observation. Once their costs and all cost determining factors (which today are called cost drivers) are known, the cost function for a combination of processing steps selected by management can be determined. The emerging total costs then depend on the number of times, such combinations need to be repeated to achieve the desired output quantity.

## SUMMARY

In summary, it can be said that German production-function-based cost theory went beyond the prevailing direct cost-volume relationship. It replaced the traditional approach with an in-depth cost behavior analysis thus relating cost more closely to input rather than output; it seems to succeed in explaining the impact of management's actions, especially the fact that the same output can be obtained with various cost levels. In this respect, it can be classified as a more comprehensive theory (or at least hypothesis) which — for a given task — provides for several different cost projections which are verifiable in the real world. It may not be going too far to conclude that in today's international competitive environment an enhanced understanding of cost behavior will contribute substantially to improve management's ability to reach a minimal cost combination in its decision making process. With a more detailed knowledge of cost behavior patterns, the ability to control cost, and to provide and monitor relevant data will be enhanced. This will permit improved analytic attempts to isolate, identify, and monitor cost drivers.

The German cost accounting developments may provide additional impulses for managerial accounting developments. Johnson and Kaplan [1987] argue that managerial accounting has lost its' relevance by largely stagnating in procedural approaches and not taking into account changes in production technologies and economies of scope. As a result, traditional overhead allocation procedures are providing insufficient information for cost management — particularly in view of the growth of fixed cost, short-

ened product life cycles and the need to identify strategic strengths and weaknesses in cost. To rescue management from this situation it appears necessary to fully understand cost behavior and enable management to perform cost analysis, which allows projection of cost for changing production programs. For this, there seems to be little material available in the literature. Combining statistical analysis techniques with the conceptual approaches found in the German literature may contribute towards better understanding of the problems. This appears to be true even if one assumes that available conceptual/theoretical approaches are still incomplete. They at least will provide additional paradigms for further research and prevent repeats of past incidents in which existing research in other countries has been ignored - thus leading to repeats of analytic work which had already been done elsewhere.

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