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Industrial Services in Austria

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I. Introduction

In the 1970s and early 1980s, the wave of fashion was that the mature economies would develop into service economies, thereby setting the stage for the post-industrial society. However, a few years later, these so-called post-industrial nations gradually lost ground in economic competitiveness. One discovered that "manufacturing matters"! However, at closer inspection, it was apparent that manufacturing could not go it alone - it demonstrated that new industrial services had a symbiotic relationship with manufacturing, and contracting out and make or buy were the then often used catch words.

Full recognition of the new division of labor between services and manufacturing has still not been reached. An in-depth understanding is hampered by both theoretical and empirical shortcomings. On the theoretical side most researchers still stick - often only half-heartedly - to the neoclassical concept of the firm and the market. Yet, more often than in the past a firm does not resemble the model of a fully integrated organization. It is evermore possible that parts of the organization are totally externalized, that parts are externalized to rigidly tied subcontractors, that parts are shared with strategically allied partners, and so on. The network company has been suggested as the model organization of the future but hitherto, is probably only an extreme example of possible developments. What needs to be analyzed is the set of firm, market and hybrid transactions which constitute modern organizations. Services play a crucial role within such patterns.

On the statistical/empirical side one has to deplore the backwardness of accounting standards. Cost accounting is based on procedures of physical production. Intangibles in investment and in the segments of the value-added chain create huge accounting problems when only the conventional framework is applied. Hence, it is no surprise that firms just do not know how much they spend on services or, for example, what a \$1 million investment in hardware would entail in software. As long as firms are unable to process relevant data an improvement of national accounts is impossible. Therefore, existing statistics and most important input-output tables only poorly reflect the true importance of services within a modern "manufacturing-services-continuum". This is particularly deplorable as today both firm strategies and economic policymaking are based on shaky grounds.

The following paper on industrial services in Austria tries to collect information on services from several sources. First, it places the country in the context of international comparisons. Second, it displays an empirical description of the manifold service branches. Third, it shows the sector in practice through case-studies of selected firms.

The case of Austria may be interesting since this small industrialized country is at the verge of entering the new stage of a manufacturing/services pattern. Empirical evidence is found that in this phase thorough overhaul of services necessary to industry is needed. On the whole, service companies tend to be too small, too dependent from foreign mother companies, too ill equipped with latest know-how as well as software, and too poorly financed in order to face adequately the demand for specialized and sophisticated services. However, a few outstanding companies show that breakthroughs may be achieved. Either demand creates a growing offering of competent services or services have to be developed in-house on a do-it-yourself basis. In any case, these trends enhance competitiveness of the Austrian economy significantly.

Executive Summary

Over the centuries, from mercantilism to marxism, services have been considered by many to belong to the non-productive sector of the economy. Only since the turn of the century have services been included in measures of national economic output.

Services are unique because consumption cannot be separated from production - they both occur simultaneously. The service industry can be organized into market and non-market services. Non-market services include the non-profit social services provided by government, health institutions, education services, and religious organizations. Market services are for profit, and can be broken down into the consumer services (retail trade, accomodations, food, and beverages, amusement and recreation, personal services, etc.) and the industrial services (consulting, accounting, engineering, software, advertising, etc.).

Industrial services are exchanged in intermediate markets, in which the services are purchased primarily by business and industry. Within the classification of industrial services, there is a further delineation between traditional industrial services, such as banking, insurance, and law, and "new" industrial services, particularly management consulting, accounting services, advertising, market research, and engineering/technical services.

As a percentage of the economy in industrialized countries, the tertiary sector has been growing at a steady pace at the expense of the primary and secondary sectors. In 1980, most OECD-countries surpassed 55% as a percentage of the total value-added created by the tertiary sector. Today, most of these countries have surpassed the 60% mark and are approaching or surpassing 65%. Austria's tertiary development is in the lower third of the OECD ranking in terms of nominal GDP at over 60%.

Possible arguments for the tertiarization phenomcnon include unbundling, output and income growth, information technology, and an increasing complex environment. In effect, the tertiarization phenemenon can be considered the "industrialization" of the service sector. Such industrialization is occuring in services for the very same reasons as the industrial revolution at the turn of the century - centralization of the services increase specialization, standardization, and systematization of the process of delivery. As a result of the concentration of activities in a mass-production format, producer services contribute cost- and performance-effective activities to the firm that otherwise would not exist or would be performed at a lower level of effectiveness within the firm.

More often than in the past a firm does not resemble the model of a fully integrated organization. It is evermore possible that parts of the organization are totally externalized, that parts are externalized to rigidly tied subcontractors, that parts are shared with strategically allied partners, and so on. Reasons for less internalization and increasing externalization may include cost savings, levels of investment, confidentiality of company secrets and core competencies, vulnerability to suppliers of services, and technical capability of firm or suppliers to perform services.

A precondition to the development of the "new" industrial services is the existence of

demand by the goods-producers. In recent years, demand of producer services has increased as a result of increasing sophistication, internationalization, and complexity of the value chain.

A second precondition to the development of a "new" industrial services sector is appropriate skill levels of the employment pool. Formal training, especially for engineering, consulting, software, and accounting services, is an important requirement to feed these labor requirements. However, lower levels of training and education are also important requirements to the advancement of the "new" industrial services. These requirements, similar to the training requirements of "pink collar" labor in traditional industrial services, are necessary more for the "industrialized" or "standardized" industrial services geared towards high volume mass distribution.

A third precondition to the development of services is financing. As a result of the increased use of information technology and the importance of communications, capital requirements in producer services are significantly high and growing. One can expect this capital-intensity to continue to increase, increasing the service sectors reliance on financial markets for funding. Whereas for a manufacturing firm standard venture capital financing would be the most common form of financing, service firms have no on hand collateral such as heavy machinery and inventory. Therefore, financing is more than just conventional venture finance - it has to be based on firm cash flows.

Because of inadequate accounting practices, it can be difficult to quantify the full impact of services. The multiple standards of treating intangible assets as well as the intermingling of production and service costs within the balance sheet results in the inability to delineate the structural relationship between manufacturing and industrial services. In effect, different accounting procedures between countries hinder not only the ability to compare, but also to draw conclusions concerning the activities of firms based upon financial reporting.

Nevertheless, the statistics concerning Austria provide some insight to the country's service sector. While Austria ranks in the lower third of OECD countries regarding the development of the tertiary sector, it has realized strong growth since 1964. On average, the tertiary sector increased 3% to 3.5% as a proportion to GNP from 1964 to 1990. The largest leap was in 1980-1985 period, when the tertiary sector grew 3.6%. For the period 1964 to 1990, the service sector grew as a proportion of GNP 14.8%, which was thereby reciprocated by decreases of 7% and 7.8% by the primary and secondary sectors, respectively.

The fastest growing group of Austria's service industry is the producer service sector (i.e. financial services, software development, and accounting and consulting services). In producer services, taxable revenue grew from roughly 20 Billion ATS in 1974 to over 80 Billion ATS in 1988, representing an increase from 1.5% to over 2.7% of total revenues in Austria. Further, with annual value-added growth of 10.8%, the number of producer service firms in Austria almost surpassed the 15,000 mark in 1988.

Relative to other OECD countries, the average firm size in Austria is small. While size has increased moderately since 1983, Austrian firms have not yet reached the critical point to be considered competitive relative to other countries in Europe. In 1983,

average firm size was 5.3 employees. By 1988, the number of employees increased by only .2 employees per firm.

The "new" producer services in Austria rely to a great extent on international interdependencies, i.e. parent-subsidiary relationships. This is particularly true in advertising, where the top advertising firms in Austria have either American or British origins. Consulting services are represented by the large international organizations as well as the small domestic offices. Software services have strong ties to the large international software producers, such as Siemens and IBM. Engineering, on the other hand, can be characterized as a widely domestic industry.

In today's industrial sector, hardware is still a very dominant proponent to the end product. However, an increasing proportion of the input factors, whether produced in-house or contracted out, are becoming devoted to services. In effect, the movement towards services can be explained as follows. First, the product is developed as stand-alone hardware. Then, after-sales services are added, followed by services as a "new product," and lastly services as a major portion of the firms business. Through this cycle of evolution, the firm achieves the following within the marketplace:

- o exposure to labor cost-competition is reduced
- o entry barriers are established
- o new product/service lines are developed
- o new markets are penetrated
- o closeness to customers is improved

While the tertiary sector is growing significantly greater than the country's aggregate real GDP, Austria's low ranking in comparison to other OECD countries indicates that many services are still being performed inside the manufacturing companies, and hence there is only a limited market for sophisticated service companies. In such a limited market, service firms cannot not reach the critical size to achieve the necessary level of efficiency for survival.

To overcome Austria's low level of tertiarization relative to other industrialized nations, a revamping of accounting standards in the direction of international standardization is necessary; regulation, which tends to be too rigid and hampers the development of industrial services, must be changed to encourage industrial service development; the size structure of the service firm has to increase; and lastly, Austria's service sector, particularly the new industrial services, has to become less dependent upon foreign parent companies.

To the developing economies, "new" industrial services are especially attractive not only because the level of value-added is extremely high (it is rather the rule than the exception that real value-added in software companies attains levels of 80% to 90%), but also "new" industrial services are high skill labor absorbing businesses. The

notorious brain drain would be highly discouraged if domestic sources of employment for high skilled labor was available. Further, the combination of high skill employment combined with average salaries would make the ensuing industrial services both domestically and internationally competitive.

II. The Service Industry in an International Perspective

A. Cross-Country Comparisons

1. Services: Types and Trends

Over the centuries, from mercantilism to marxism, services have been considered by many to belong to the non-productive sector of the economy. Only since the turn of the century have they been included in measures of national economic output. Even then the service sector was considered the residual to the primary (agriculture, fishing, forestry, and mining) and secondary (manufacturing and construction) sectors. As a result, the word "tertiary" arose without any particular meaning.

Whereas a good is considered a physical object which is transferable between producer and consumer, a service is defined as a change in the condition of an economic unit

resulting from the activity of another unit. Consumption cannot be separated from production - they occur simultaneously. The key distinctions between goods and services are: 1) tangibility vs. intangibility; 2) no direct contact vs. direct contact between the producer and consumer; 3) transferability vs. nontransferability; and 4) storability vs. nonstorability.

The service industry can be organized into market and non-market services as seen by Table 1. Non-market services include notably the non-profit social services provided by government, health institutions, education services, and religious organizations. Market services, however, are for profit, and can be broken down into the consumer services (retail trade, accommodations, food, and beverages, amusement and recreation, personal services, etc.) and the industrial services (consulting, accounting, engineering, software, advertising, etc.). (NOTE: the titles industrial services and producer services have the same meaning and are used interchangeably).

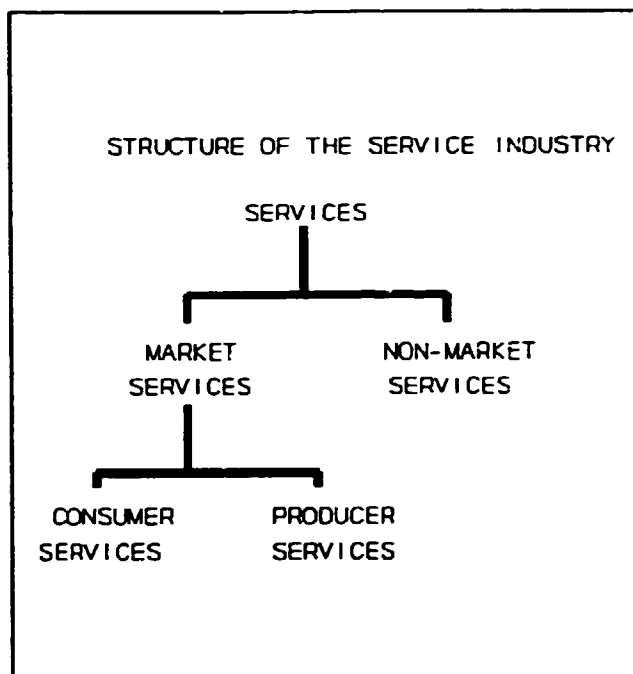
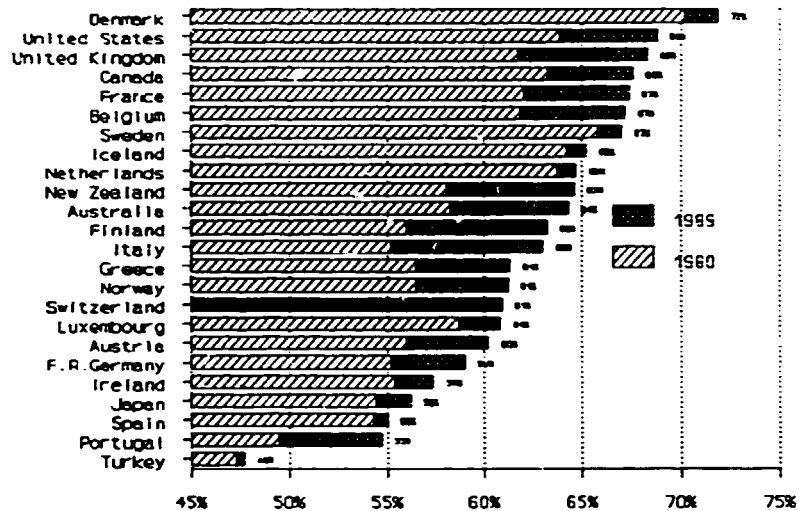


Table 1

International Comparison of the Tertiary Sector Proportion of Nominal GDP



Source: OECD

Table 2 - International Comparison of Tertiary Sector

Industrial services are exchanged in intermediate markets, in which the services are purchased primarily by business and industry. Classification of the industrial services are as follows (International Competition in Services, 1987, p.36):

Financial Services	Banking Insurance Leasing
Shipping and Distribution	Ocean Rail Trucking Air Freight Warehousing, Distribution, Wholesale Trade
Professional and Technical	Technical Licensing and Sales Architecture, Engineering, and Construction Management Services Legal Services Accounting
Other Industrial Services	Information Technology Services Franchising Advertising Other...(Commercial Real Estate, Business Travel, Security, Trade Fairs, Postal Services)

Within the classification of industrial services, there is a further delineation between traditional industrial services, such as banking, insurance, and law, and "new" industrial services, particularly management consulting, accounting services, advertising, market research, and engineering/technical services.

In order to gain insight into the importance of the service sector, we need to look at the worldwide trend of the service industry before we look specifically at industrial services. The increasing importance of the tertiary sector in domestic and world economies is demonstrated by its growth as a proportion of the aggregate economy (see Table 2). In 1980, most OECD-countries surpassed 55% as a percentage of the total value-added created by the tertiary sector. Today, most of these countries have surpassed the 60% mark and are approaching or surpassing 65%. Denmark's service sector comprised well over 70% of its value-added gross domestic product in 1990, while the tertiary sector of the United States comprised over 68% of the economy. Austria's level of tertiarization ranks in the lower third of OECD countries, ahead of both Germany and Japan. It should be noted that both Germany and Japan's tertiary sector is proportionately low as a percentage of GDP in relation to other OECD countries for two reasons - 1) the bias of the large manufacturing sectors, and 2) unique national business classification systems.

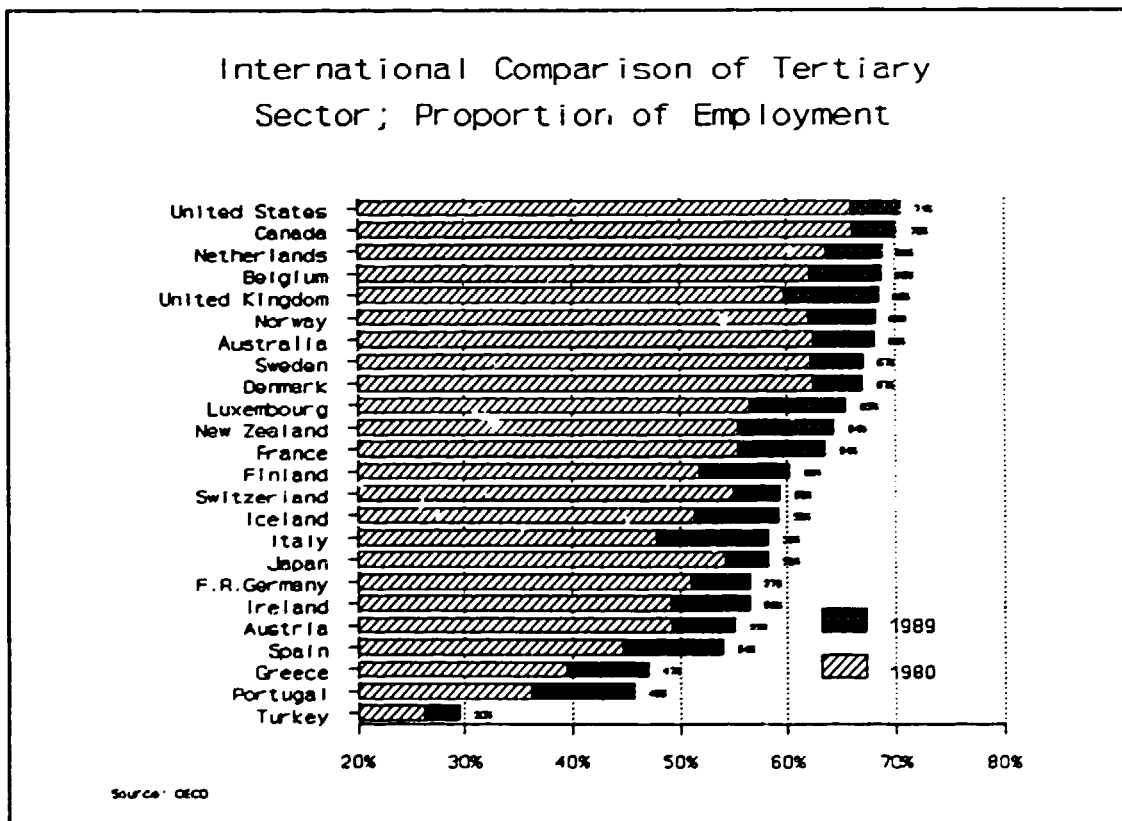
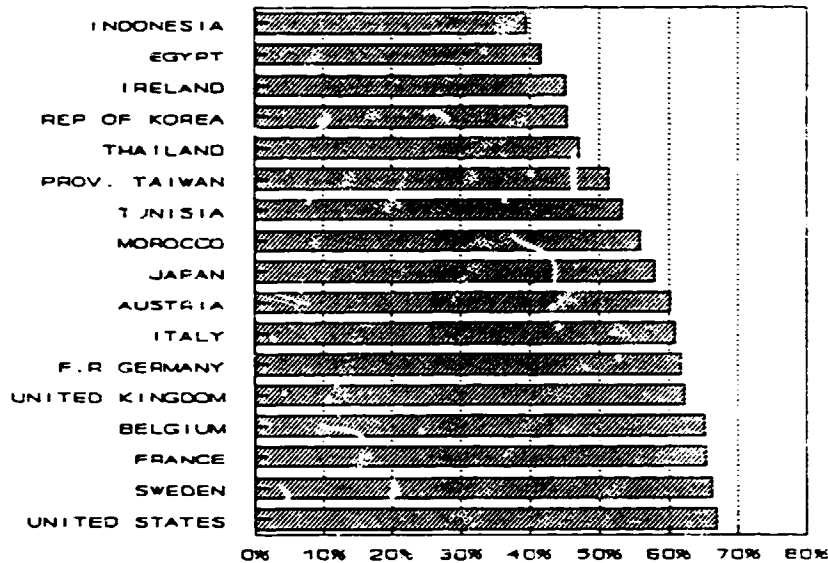


Table 3 - Tertiary Sector's Proportion of Employment

Employment figures indicate that half of the OECD countries have a service sector

**% OF VALUE-ADDED
GENERATED BY TERTIARY SECTOR**

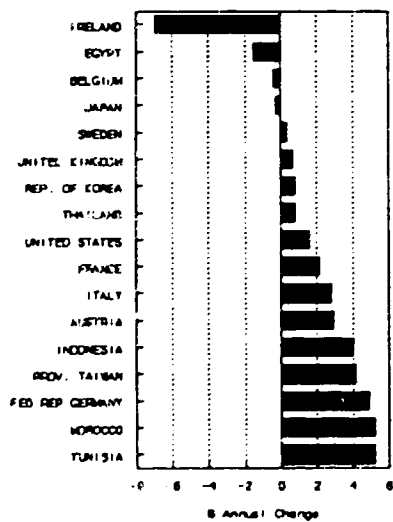


Source: UNIDO Database

Table 4 - Percent of Real Value-Added Generated by Tertiary Sector 1981.

workforce greater than 60% of the total workforce (see Table 3). Austria's tertiary development in employment is in the lower third of the ranking at 55%, below both Germany and Japan.

**AVG. ANNUAL CHANGE OF REAL VALUE ADDED
OF THE TERTIARY SECTOR 1981-1999**



Source: UNIDO Database 1981-1999

Table 5: Avg. Annual Change of Real VA

Because of their low-cost, high volume manufacturing orientation, the recently-developed and developing countries are experiencing lower levels of tertiarization than the OECD countries. Table 4, which shows the level of tertiarization using figures on value-added GDP for a sample of 17 selected countries, including developed, developing and recently-developed countries, suggests that tertiarization is a function of development. While the percentage of value-added attributed to the tertiary sector is above 60% for all the OECD countries in the sample (with the exception of Japan at 57.9%), the developing countries have significantly lower levels of tertiarization. The lowest in the sample are Indonesia and Egypt, which experience tertiary levels of 39.5% and 41.6%, respectively. Significantly

higher are Morocco and Tunisia, which have tertiary levels of 55.9% and 53.4%, respectively.

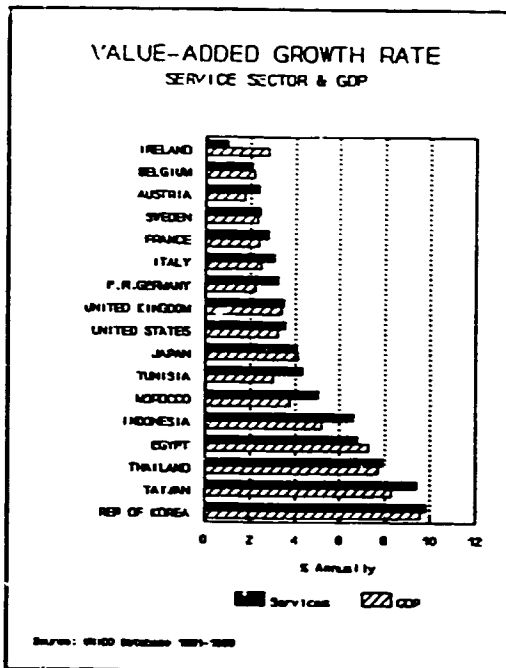


Table 6 - Real Value-Added Growth

While the OECD countries maintain high levels of tertiarization, the tertiary sector for the developing countries is experiencing higher levels of growth. As Table 5 indicates, the tertiary sector grew as a proportion of value-added at 0.6%, 1.56%, and 2.91% per year for the United Kingdom, the United States, and Austria, respectively, whereas Tunisia, Morocco, and Indonesia realized growth rates of 5.2%, 5.17%, and 4.1%, respectively (comparison for the periods 1981 and 1989). Composition of services is also an important aspect to consider when analyzing tertiarization. For example, a large proportion of the revenues generated by the service sector in Austria and Morocco is tourism, whereas the United Kingdom and the United States have a more even distribution of all the services.

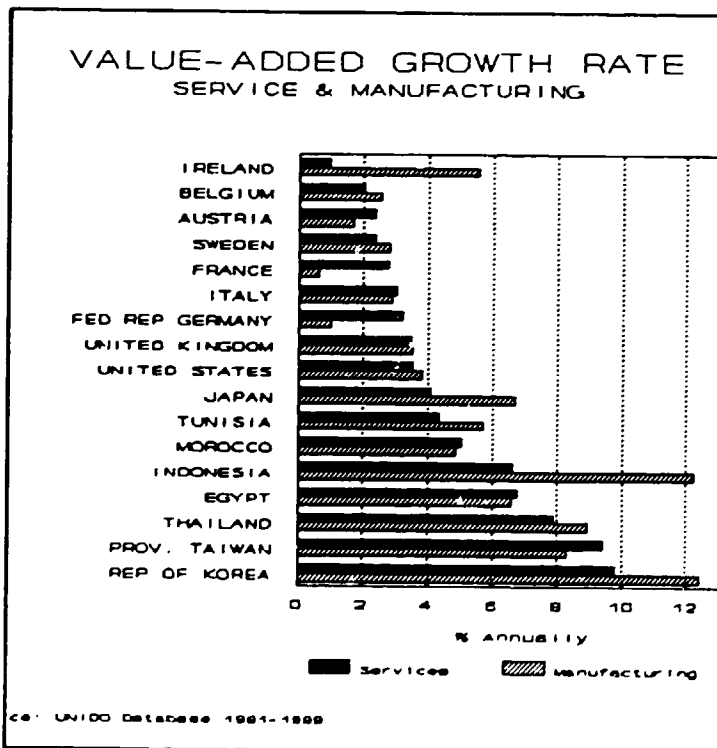


Table 7 - Real Value-Added Growth

In order for such expansion to occur, the services sector has to be growing faster than other sectors of the economy. In almost every case in the sample, the tertiary sample grew faster annually than the aggregate economy (see Table 6). Of the OECD countries, Germany's and Austria's tertiary sectors are growing the fastest relative to the aggregate economy. In only four cases in the sample did the growth of the aggregate economy surpass the growth of the tertiary sector: Ireland, Egypt, Japan, and Sweden. Tunisia's and Morocco's tertiary sectors grew 1.33% and 1.27% faster than the aggregate economy, whereas Austria's service industry grew .63%.

Table 7 compares the value-added growth rates between services and manufacturing. As assumed, those countries with "positive levels of tertiarization" (i.e. the tertiary sector is growing faster than the combined primary and secondary sectors) have value-added growth rates greater for the service sector versus those of the manufacturing sector.

B. The Rationale of the Tertiarization Phenomenon

1. Explanation

The theoretical literature forwards a host of explanation for the growth of tertiary activities. This is not the place to give an account of these approaches; however, it may suffice to recall some of the main arguments. They include unbundling, output and income growth, information technology, and an increasing complex environment.

Unbundling

The rationale behind "unbundling" is the manufacturer has found it cheaper to purchase services outside the company than to provide these services in-house. In effect, savings are realized by the specialization of services and the economies of scale, and as a result the manufacturing firm becomes more competitive in domestic and international markets.

Because of the transfer, increases in output and employment in producer services would reciprocate decreases in output and employment in goods-producing (all other variables held constant). The net transfer or "unbundling" would have no contribution to aggregate output in real terms. In fact, with the increased economies of scale and efficiency from specialization, employment and output could possibly decrease in real terms. However, it can be said that the economies realized may decrease the unit cost of the services considerably, and thus increase the customer base on a wide scale.

Nevertheless, there are some earlier studies which reject the unbundling argument as being responsible for an insignificant part of the recent employment growth of industrial services industries. In particular, the one paper (Tschetter 1987) has shown that US employment within manufacturing have actually increased in the managerial and professional levels, and have decreased in the clerical level. The analysis indicates that the decrease in employment was not the result of unbundling, but broad occupational trends, changes in industrial composition, and changes in industry staffing patterns. However, the continued growth of the industrial service sector in recent years has decreased the significance of the unbundling argument.

Real Output and Income Growth

A significant contributor to the growth in services is real output growth. There are two parts to output growth which could have a positive effect on tertiarization. First, there is growth proportionate to the increase in output for manufacturers. For example, for the case of Austria, the annual rate of real growth for the gross domestic product (VA) was 1.71% between 1981 and 1989. For the same period, Austria's GDP for services (VA) grew at 2.36%. Therefore, output growth could explain for roughly three quarters of the growth in services. Second, a by-product of output growth is increased income, which also can increase the purchase of producer services. The logic here is that as income increases for the manufacturing sector, their expenditures shift to non-essential goods, i.e. producer services.

Information Technology (IT)

The introduction of the personal computer and various data processing technologies in the 1980s has made information widely available to industry at affordable prices. In many industries, creation and maintenance of advanced information systems is necessary to remain competitive. Information technology keeps management informed of such variables as inventory levels, sales, market share, as well as intelligence information concerning the competition's products. Further, the increased demand of these "new" services have allowed the service providers to diffuse the costs of the information technology and know-how. Therefore, IT has contributed to the tertiarization of the economy, especially in consulting, accounting, and engineering services.

Complex Environment

Another reason for the increase in producer services, especially in consulting and accounting services, is the complexity of the business environment which has arisen as a result of a greater number of firms with increased leve's of diversification into different products and product-markets worldwide. The environment has become even more complex with a greater amount of government laws and regulations to govern banking practices, labor safety and conditions, environmental threats, construction codes, and transportation.

2. Framework Conditions for the Development of Industrial Services

Demand

The first and most important precondition to the development of producer services is the existence of demand by the goods-producers. In recent years, demand of producer services has increased as a result of increasing sophistication, internationalization, and complexity of the value chain. Value-added partnerships, a network of individual contributors within a value chain, improve efficiency and responsiveness to the marketplace, and also decrease the level of complexity within the firm. They are a driver behind the growth of producer services, in which producer services are offered outside the firm as efficient, cost-effective, and responsive contributors to the finished product.

Producer services are being "industrialized" for the same reasons as the goods-producing predecessors of the industrial revolution. Centralization of the services increase specialization, standardization, and systematization of the process of delivery. As a result of the concentration of activities in a mass-production format, producer services contribute cost- and performance-effective activities to the firm that otherwise would not exist or would be performed at a lower level of effectiveness within the firm.

The development of producer service firms has to complement the development of demand, i.e. the goods-producing sector. While the delivery of services is standardized, it still has to provide customer-specific/tailored solutions to the producers. In many cases, the quality of the product is a function of how demanding customer is.

While services require that consumption and production occur simultaneously, both parties of the transaction are privy to determining where consumption takes place. In other words, demand can go to where the services are provided. The following is the classification of consumption of services (Porter, 1999, p.249):

1. Mobile buyers travel to a nation to have services performed. Services would include tourism, education (MBA education in the US), ship repair, warehousing, and airport services.
2. Firms from one nation provide services in other nations using domestically based personnel and facilities. The home country firm provides the know-how, training, and possibly the management to the foreign subsidiary, and recruits personnel from the foreign subsidiary's country.
3. A nation's firms provide services in other countries via foreign service locations, staffed with either expatriates or local nationals. For example, television advertising spots are usually shot in foreign settings, and are cut and edited in London, New York, or Milan.

Human Resources

On the whole, the workforce within the producer services sector is white-collar. Within

white-collar occupations, there are three separate types of occupations:

- o managerial and administrative;
- o professional and technical;
- o clerical, sales, and service.

Within this typology, the first two, managerial/administrative and professional/technical are considered high-skilled occupations, whereas clerical, sales, and service are considered medium- and low-skilled occupations. The majority of occupations in producer services would lie in the high-skilled categories.

Formal education, mainly at the university level, is the most common form of education, especially for the engineering, consulting, software, and accounting services. Advertising, meanwhile, would require the lowest level of formal education, however, is nevertheless supplied in many western economies by formally-educated workers (for example, MBAs in the United States).

Capital Requirements

As a result of the increased use of information technology and the importance of communications, capital requirements in producer services are significantly high and growing. Computer and communication technology is a necessary input to producer services. IT-capability is necessary in addition to equipment itself, and can be considered part of the investment. Further, competition, technological advancement and demanding customers require the producer service firm to produce new and improved services, thereby requiring an R & D effort.

Annex I: Externalization - the Microeconomic Decision

The decision whether to internalize or externalize a service is a microeconomic one - it depends upon the conditions of the marketplace and the firm. There is no set rules concerning the externalization decision; however, there are the obvious factors within every decision:

Costs	externalization may result in lower costs via specialization, economies of scale and scope, and lower input costs (i.e. labor).
Investment	internalized services require a significant level of investment, which depends upon the firm's financial situation (cash, debt, etc.).
Confidentiality	propensity of disclosure of company secrets increases considerably when contracting out services.
Vulnerability	the risk of supply shock in all forms increases via externalization.
Capability	the complexity of the service and whether the firm has the know-how (or wants the know-how).

Annex II: The Problems of Accounting

One of the major problems with developing theories concerning producer services and developmental economics is heterogenous accounting practices worldwide. In effect, different accounting procedures between countries hinder not only the ability to compare, but also to draw conclusions concerning the activities of firms based upon financial reporting.

Further analysis of the problem indicates that one of the largest problems with corporate reporting on a worldwide basis concerns intangible assets. Firms rely upon both tangible and intangible assets to gain a competitive advantage on competitors. In recent years, the investment in intangible assets has been outstripping that of tangible fixed cost investment.

Some of the most important investments to a firms competitiveness is intangible assets. However, because of a bias towards non-reporting of intangible investments and the incongruity of accounting principles towards the reporting of intangibles, it is almost impossible for policymakers to make conclusions without the complete reporting of investments.

The dearth of information exists in areas essential to the development of policy. Such "unreported" intangibles include domains such as patents and licenses, information systems, research and development, organisational restructurings, marketing, and trade marks and brand names. While there is wide agreement among policymakers that the problem exists, there is widespread disagreement concerning solutions.

One step proposed as a solution is the disaggregate reporting of all intangibles without the specification of whether they are discerned as an asset or investment for balance sheet purposes. This would certainly be a first step. Disaggregation should be to the point to where they do not disclose corporate strategy and secrets.

Additional reporting of information should be explored outside the periphery of the formal financial statements. Information could also be in a quantitative form as well as qualitative form, thereby giving the investor a better perspective on the actual prospects of the business.

Nevertheless, one of the major differences in opinion concerning intangibles develops in regard to the recognition and measurement of intangibles as assets for balance sheet purposes. First, recognition concerns the determination of when an expenditure is a long-term investment. The first approach is the "traditional approach. Traditional conservative accounting tends to discern intangible expenditures as period costs. Tax laws, for example in Japan and Germany, which allow considerable deductions, encourage the conservative accounting treatment. Another approach is separability, which involves whether the intangible can be sold to another firm. The last approach is pointed towards the recognition of acquired and internally generated intangibles according to future economic benefits. Naturally the last approach is the most sensible, however it can be very subjective in nature in the control of the accountant and the stockholder.

Concerning measurement principles, the major conflict is between the cost-based approach and the valuation approach. The cost-based approach is based upon the theory that the balance sheet is a vehicle for the reflection of value in terms of solvency, whereas the the valuation approach is based upon the estimation of the valuation of the future cash flow an asset will generate. Certainly a criteria for choosing the approach should be sensitive to the various uses to stockholders, creditors, and other interested parties. The choice can be characterized as a spectrum stretching from the prudent German/Japanese approach on the right to the flexible risk-taking UK approach on the left.

In any case, the problem stated above exists, and until accountants find a solution, the net result is the difficulty of the policymaker to draw conclusions concerning producer services from corporate reports.

III. Service Industry in Austria

Within Austria's fast growing service sector, the new industrial services - consulting, engineering, advertising, accounting, software, market research, and trade shows and exhibitions - are growing at the fastest rate. Meanwhile, the traditional services - banking, insurance, etc. - realize more mature, decelerating growth rates.

A. Overall Statistical Trends*

While Austria ranks in the lower third of OECD countries regarding the development of the tertiary sector, it has realized strong growth since 1964. Overall services have been growing as a proportion of GNP while the producer sectors have been decreasing:

Breakdown of Sectors as a Proportion of
Austria's Gross National Product

Sector	1964	1970	1975	1980	1985	1990
Primary	10.6%	7.6%	6.0%	5.2%	4.0%	3.6%
Secondary	44.9%	44.8%	42.7%	40.9%	38.3%	37.1%
Tertiary	44.6%	47.6%	51.3%	53.9%	57.5%	59.3%

On average, the tertiary sector increased 3% to 3.5% as a proportion to GNP from 1964 to 1990. The largest leap was in 1980-1985 period, when the tertiary sector grew 3.6%. For the period 1964 to 1990, the service sector grew as a proportion of GNP 14.8%, which was thereby reciprocated by decreases of 7% and 7.8% by the primary and secondary sectors, respectively.

Industrial Services In General

The fastest growing group of Austria's service industry is the producer service sector (i.e. financial services, software development, and accounting and consulting services). In producer services, taxable revenue grew from roughly 20 Billion ATS in 1974 to over 80 Billion ATS in 1988, representing an increase from 1.5% to over 2.7% of total revenues in Austria.

There are three sources in Austria for economic statistics: the Betriebssystematik (BS), the Kammersystematik (KS), and the Tax Reporting system. Each source has a different legal purpose. On the whole, none of the systems are constructed exactly to our research specifications. However, the Kammersystematik, the most general of the three systems, has overall the best reporting structure for producer services. As a result, we will use the Betriebssystematik for the purposes of this study.

The official statistics portray an economic sector on the fast-track of growth. The source of the statistics in this section is the Austrian Betriebssystematik (Industriewissenschaftliches Institut an der Wirtschaftsuniversität, 1992, pp. 29-55). Please note that the "% chg" column in the following table is computed annually:

* the source of the following statistics is: IWI, 1992

Producer Services in Austria - Betriebsstatistik

	1983	1988	% CHG
Number of Firms	4,449	6,246	7.8
Employees	23,687	34,368	7.8
Self-Employed	19,743	28,759	7.8
Value-Added	8,887	14,858	10.8
Investment (mio. ATS)	1,589	2,765	11.7
Personnel Expenses (mio ATS)	5,358	9,327	11.7

With annual value-added growth of 10.8%, the number of producer service firms in Austria almost surpassed the 15,000 mark in 1988. Growth was fueled by 11.7% annually, surpassing the 7.8% average annual increase in the number of employees. As a result, it can be deduced that personnel compensation and training rose significantly during the period.

Table 8 indicates the growth of producer services as a proportion of the Austrian economy (note: GVA - gross value-added; NVA - net value-added). While the total number of Austrian firms in general increased from 186,000 to 190,000 between 1983 and 1988, the producer services sector increased from 4,449 to 6,246 firms in 1988.

This represented an increase from 2.4% to 3.3% of the number of firms in Austria for the period. Compared to the high increase in the number of firms, increases in the number of employees, investment, and even value-added were significantly lower. The most probable reason is because of the entry of multiple "one-man shop" producer service firms.

Supporting the "one-man shop" theory further is the figures concerning firm productivity. While nominal productivity for producer services increased almost 3% annually, real productivity dropped over 5% annually. In effect, the marginal increase in employment had a negative impact on productivity.

Most critical to the analysis of Austria's producer services industry is the firm-specific statistics - firm size, firm productivity, and average investment per firm. Relative to other OECD countries, the average firm size in Austria is small, and is a major point of contention concerning this sector's competitiveness in joining the European Community. While size has increased moderately since 1983, Austrian firms have not yet reached the

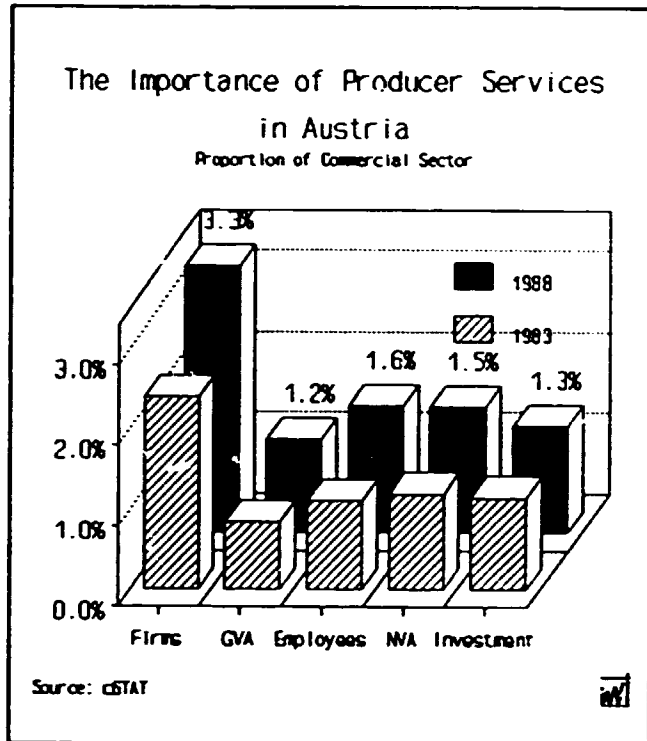


Table 8

critical point to be generally considered competitive in Europe. In 1983, average firm size was 5.3 employees. By 1988, the number of employees increased by only .2 employees per firm. However, what is to be remembered here is the large number of one-man shops which entered the sector in the period, which to a large extent disqualify our conclusions concerning the larger domestic and international concerns. The following table illustrates the situation further:

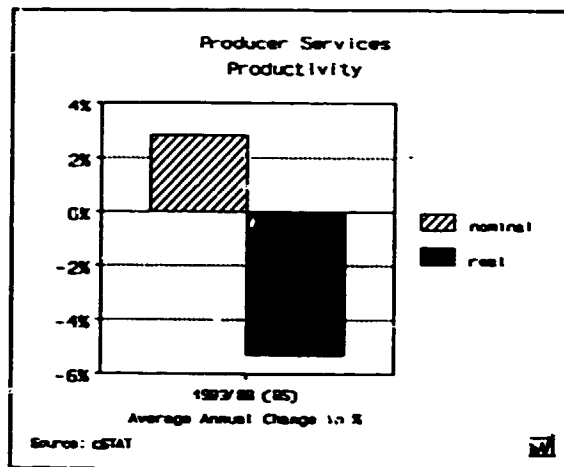


Table 9

Firm Size/Productivity Statistics - Producer Services

	1983	1988
Size of Firm		
Total Employees Per Firm	5.3	5.5
Non-Self-Emp. Per Firm	4.4	4.6
Net Value-Added per Firm (in thousand ATS)	2,000	2,300
Personnel Expenses per Firm (in thous. ATS)	1,200	1,490
Productivity		
Net Value-Added per Employee (in thous. ATS)	380	430
Personnel Expenses per non-self-employed Employee (in thous. ATS)	270	320
Value Creation Quota (%)	43.1	43.0
Investment		
Investment per Firm (in thousand ATS)	360	440
Investment Rate (Net VA)	17.9	18.6
Investment per Employee (in thousand ATS)	70	80

B. Structure and Development of the "New" Service Industry by Individual Branches

As opposed to the services performed for households and communities, industrial services are targeted towards the needs of the manufacturing organization. They are an extension of the value chain. While in many cases firms choose to internalize the service, externalization reaps the rewards of specialization and expertise. Within the industrial services sector, the "new" industrial services are becoming increasingly important as result of the information and telecommunications technology advancements of the 1980s and 1990s. As a result, development of a capable new industrial service sector is paramount to development of a competitive manufacturing sector in today's global economy.

Overall, one can conclude that the producer services rely to a great extent on international interdependencies, i.e. parent-subsidiary relationships. This is particularly true in advertising, where the top advertising firms in Austria have either American or British origins. Consulting services are represented by the large international organizations as well as the small domestic offices. Software services have strong ties to the large international software producers, such as Siemens and IBM. Engineering, on the other hand, can be characterized as a widely domestic industry.

The following is an overview of the new industrial services. The overview describes the international and the domestic aspects of the particular services. The purpose is to give an idea of each industry's domestic situation, and where it fits in an international context.

i) Consulting and Accounting

The number of firms for the 83/88 period increased moderately enough. However, the increase cannot be attributed to one-man operations, because the number of self-employed people dropped by 0.3%. Value-added increased 6.1% annually, and investment increased a whopping 26.6% annually, thereby indicating the capitalization of information technology by the consulting industry in Austria.

Consulting in Austria

	1983	1988	% CHG
Number of Firms	508	575	2.5
Employees	1,873	1,953	0.8
Self-Employed	1,500	1,479	-0.3
Value-Added	689	925	6.1
Investment (mio. ATS)	43	140	26.6
Personnel (mio. ATS)	461	523	2.6

The figures on the following page indicates that the consulting firm size in terms of the number of employees) decreased for both employees and self-employed personnel. Meanwhile, the net value-added per employee increased, and investment

increased by a multiple of 3!

Firm Size/Productivity Statistics - Consulting

	1983	1988
Size of Firm		
Total Employees Per Firm	3.9	3.4
Non-Self-Emp. Per Firm	3.0	2.6
Net Value-Added per Firm (in thousand ATS)	1,360	1,610
Personnel Expenses per Firm (in thous. ATS)	910	910
Productivity		
Net Value-Added per Employee (in thous. ATS)	370	470
Personnel Expenses per non-self-employed Employee (in thous. ATS)	310	350
Value Creation Quota (%)	50.6	51.6
Investment		
Investment per Firm (in thousand ATS)	80	240
Investment Rate (Net VA)	6.2	15.1
Investment per Employee (in thousand ATS)	20	70

Consulting

In 1991 approximately 900 Consulting Firms existed in Austria. They employed 2,500 employees and generated sales of 5 Billion ATS. The growth per year was between 6% and 7%. In some special consulting areas, such as Personnel and High Technology, annual growth was as high as 20%.

The largest entrance barrier to consulting in Austria is not financing but know-how and customer contact. Increasing competition is resulting from expansion into consulting by Banks, accounting firms (the "Big Six), advertising firms, and subsidiaries of foreign consulting firms. As the economies of scope and scale climb, international partnerships will increase in importance. Consulting solutions tailored specific to the customer will become increasingly important. Further, with the opening of Eastern Europe, expansion of Austrian consulting firms into Eastern Europe is expected.

According to an IWI-survey, the expense per employee for training and continuing education is between 10,000 and 38,000 ATS annually. Wages in 1988 increased 2.6% per year and averaged 350,000 ATS per employee. 25% of those working in consulting in Austria are self-employed. 88% of the consulting firms operate with 1 to 4 people, whereas the remaining 12% employ between 5 and 70 people.

The organization charged with the the training and continuing education for future current consultants is the Austrian Academy of Organizational Consulting. The

organization trains and tests 100 consultant candidates per year. 80% of the future consultants already have completed a degree in college education, mainly in the field of Business. After completing this program, 60% of this group will be self-employed.

Since 1983, investment in consulting has been growing dramatically. With annual investment growth of 26.6%, consulting firms in Austria invested more than 140 million ATS in 1988. Of the total, the three largest firms invested an average of 13.4 million ATS per firm. Overall, the average investment of 240,000 ATS per firm was in the form of information technology.

Consulting in Austria is conducted similar to traditional consulting in the United States and Great Britain. The market segments include Personnel Management, Organizational Analysis, Marketing, Technology and Innovation, Mergers & Acquisitions, and Tax, Finance, and Investment Planning. The extent to which a firm employs the services of a consulting firm is a function of size. The larger firms are more likely to employ the services on the consultant on a wide scale.

The consulting industry is expected to continue to grow at a rate between 7% and 10%. Growth will continue because 1) firms will continue to externalize the services provided by the consulting firms, and 2) increased demand as a result of the changes in business environment (Austria's entrance into the EG, EFTA/EG Economic Area, and the opening of Eastern Europe). While the small size of the Austrian consulting firms is not expected to change, international partnerships will grow to take advantage of a higher resource pool and capacity.

Accounting Firms

Austria's Accounting Services, offering the traditional services of bookkeeping, auditing, tax accounting, and certification of reporting, are under the auspices of the Austrian Chamber of Certified Public Accountants. As of the beginning of 1991, 4,114 Accountants belonged to the Chamber and generated revenues of 10.3 billion ATS in 1990. While the revenues of member firms have increased 30% annually between 1985 and 1990, the Chamber's membership has increased 16%.

The accounting industry is comprised of a large number of small accounting offices and a small number of large international accounting firms. Austrian accountants are classified as Tax Advisers, Auditors, and Certified Public Accountants. 73% fall under the Tax Adviser category, whereas 9% and 18% are Auditors and Certified Public Accountants, respectively.

Tax Advisers, who are concerned with the bookkeeping and tax reporting of small- and medium-sized business organizations, are grouped mainly into one-man business entities. Certified Public Accountancy, requiring the resources of the large accounting organization with highly-qualified personnel, is more the domain of the Big Six. The most important areas of involvement for Certified Public Accountancy are Cost Accounting, Auditing, Tax Advising, Management Consulting, and Bankruptcy. The relation of the activities of the C.P.A. firms to traditional consulting has caused the recent trend towards integration.

The largest accounting firms in Austria are:

- o KPMG Alpen-Treuhand Gruppe, with 500 employees;
- o Süd-Ost-Treuhand AG, with 284 employees;
- o Price Waterhouse AG, with 210 employees.

The average revenue per large accounting firm with over 150 employees is more than 100 million ATS, whereas the revenue for a firm with an average of 30 employees stands at 20 Million ATS. Surprisingly, the revenue per employee is approximately the same between the large and small accounting organizations. Investment is mostly self-financed, and according to an IWI-survey was between 27.5% and 60% of annual expenses.

While Austria's entry into the EC will bring more and larger clients to Austria, it will also increase competition in accountancy. In the international arena, only those firms also involved in management consulting, information technology consulting, personnel consulting, as well as innovation, subsidy, and financial consulting will remain competitive.

International Aspect

The international consulting and accounting industries during the 1980's were characterized by fervent growth, horizontal integration, and consolidation. In order to take advantage of synergy effects created by the combination of the two industries, consulting firm Ernst & Whinney merged with accounting firm Arthur Young, and consulting firm Deloitte, Haskins & Sell merged with accounting firm Touche Ross. The mergers changed the face of the industry by transforming the concentration of eight (the "Big Eight") to a concentration of six large international consulting/accounting enterprises (the "Big Six"). In 1989, the "Big Six" generated 40 Billion DM in sales and employed 350,000 people worldwide. The smallest of the six accounting/consulting groups, Price Waterhouse, is ten times larger than the largest German group, and more than one hundred times larger than the market leader in Austria (KPMG-Alpentreuhand: 350 employees).

Because of the importance of information technology (IT) in both industries, the accounting/consulting firms have been expanding their services to include IT services. For example, McKinsey acquired the Information Technology Group, an IT group with 200 employees. However, as synergy effect expectations are potentially unrealized, either due to the economic recessions or the over-inflated expectations of the existence of the so-called synergy effects, disaggregation may occur.

ii) Engineering and "Technical Services"

While the engineering sector experienced a 3.8% increase in the number of firms and a 3.5% increase in personnel, the figure for investment for the period dropped 10.1%. Value-added, meanwhile, increased at 6.1% annually.

Technical Services in Austria

	1983	1988	% CHG
Number of Firms	1,396	1,684	3.8
Employees	5,694	6,758	3.5
Self-Employed	4,428	5,182	3.2
Value-Added	2,134	2,868	6.1
Investment (mio. ATS)	664	390	-10.1
Personnel (mio. ATS)	1,391	1,830	6.2

Overall, the "technical services" sector did not realize any major change in firm size, however, productivity did improve with a change of net value-added per employee from 370 thousand ATS in 1983 to 420 thousand ATS in 1988 (see the following table next page).

Firm Size/Productivity Statistics - Technical Services

	1983	1988
Size of Firm		
Total Employees Per Firm	4.1	4.0
Non-Self-Emp. Per Firm	3.2	3.1
Net Value-Added per Firm (in thousand ATS)	1,530	1,700
Personnel Expenses per Firm (in thous. ATS)	1,000	1,120
Productivity		
Net Value-Added per Employee (in thous. ATS)	370	420
Personnel Expenses per non-self-employed Employee (in thous. ATS)	310	360
Value Creation Quota (%)	14.2	48.2
Investment		
Investment per Firm (in thousand ATS)	480	230
Investment Rate (Net VA)	31.1	13.6
Investment per Employee (in thousand ATS)	120	60

Engineering

Represented by the Federal Engineering Council and an arm of the Federal Chamber of Commerce, Austrian engineering firms are more inclined to specialize in niche engineering markets (such as road-building and resort construction), whereas foreign firms are more geared towards a multi-disciplinary approach. Currently the dual capability of civil engineering and technical planning is becoming increasingly important amongst Austrian firms, as well as the capability to conform to EC codes for engineering and construction.

In comparison to foreign firms, Austrian engineering bureaus are more inclined to specialize in certain engineering branches, whereas foreign firms are geared towards a multi-disciplinary practice.

Engineering is growing in importance in construction in Austria. Technical consulting, such as construction physics, technical chemistry, technical physics, and electronics, is the fastest growing area in engineering in Austria. Overall, the engineering branch consists of 1,500 technical firms with approximately 5,000 civil engineers, and in total employs 20,000 people. The structure of the engineering consulting branch is characterized mainly by small firms. Over 80% of all engineering firms have under five employees. The dependence of the engineering branch to the general economic situation is demonstrated by the decline in employment, production, and investment corresponding in the sector to the economic declines of 1985 and 1990.

Estimates of total sales generated by Austrian engineering firms oscillate between 7 and 50 billion ATS. According to federal tax statistics, taxable revenue amongst the engineering bureaus in 1988 was 17.3 billion ATS.

Austrian engineering firms are plagued by a shortage of qualified personnel and increasing personnel costs. According to an IWI survey, annual salaries averaged 300,000 AS per non-self-employed engineers. Meanwhile, training and continued education averaged 50,000 AS per employee per year for the small engineering firms, to only a few thousand schillings for the larger engineering firms.

Export of Austria's engineering services is relatively insignificant (appr. 1 billion ATS in 1985). However, there is a strong desire amongst the trade associations and Austrian policymakers to improve this situation.

Investment decreased dramatically for engineering firms between 1983 and 1988. The main reason is attributed to the largest investments incurred by the firms in building in 1985. Firms with more than 50 employees invested an average of 5.4 million ATS in 1988. The five largest firms invested an average of 9.3 million AS in the same year. Fifty percent of the investments is in machinery, whereas more the 25% is in real estate. 80% of the investment was self-financed by the engineering firms.

Austria's future opportunities exist in the eastern European market. The largest

competitive disadvantage is the small size of the austrian firms. However, because of their high education standards and excellent know-how, austrian firms have the advantage of an excellent reputation abroad. In the export of their services, "soft consulting services," such as financial engineering, are becoming more important in order to give the services are more comprehensive meaning.

International Aspect

The largest provider of engineering services in the world is the United States, followed by Great Britain. Within the EC, the engineering market has reached 23 billion ECU in revenue. While Great Britain followed by Italy have the largest sales volume generated by engineering services, Germany has the largest number of engineering firms.

Worldwide competition is ever growing in engineering. Competition is expected to increase with the realization of the EC's "frontierless" economic market after 1992. Overall, the most important foreign customers for engineering consulting has been the developing countries, which in 1985 accounted for 86.2% of the world export in technical consulting (Lamel, Mesch, Solka, 1990, p.xx). In 1985, 80% of the engineering revenues were by firms with annual sales greater than 50 million ATS. In the future, only the smaller firms with high competence in specialized areas will be able to compete with the large engineering enterprises.

Because of export opportunities, the small size of some national construction markets does not automatically breed small engineering bureaus. For example, large engineering firms with hundreds of employees exist in Finland, Norway, Sweden, and Denmark. Future opportunities will especially exist in environmental engineering, such as in recycling, environmental-conscious city planning, environmental-friendly construction material, and so on.

Software

The most important firms in the software market are:

- o Systems Houses: they offer compete systems for specific purposes, both software and hardware. Their market share on the software market is small.
- o Software Houses: specializing in the development and marketing of software. Despite their growing number and sales, they have not reached the prominence and dominance of the hardware producers.
- o Hardware Manufacturers: they dominate the austrian software market with almost 50% of the market.

The product portfolio of the software business includes:

- o Standard Software: this accounts for approximately 42% of the software

market. Standard software includes systems software, such as operating systems and databases, and standardized-use software, such as software for technical science and branch-specific programs.

- o Individual Software: accounting for 15% of the market, this is software developed for the specific needs of the customer.
- o Services: making up 43% of the market, services include software maintenance (13%), hardware maintenance (8%), and training and consulting (22%).

The representative trade union for the software industry is the Association of the Austrian Software Industry. In 1990, 35 firms were represented in the organization, with 5000 to 6000 software workers and 50% of the market sales. Between 1988 and 1990, software sales climbed at 32%, whereas computer services increased at 14%. Combined the branch grew at 24%. The sales for individual and standard software for 1990 is estimated at 12.6 billion AS, while the sales for software maintenance for the same period is estimated at 1.8 billion AS. Of the total 22.3 billion AS software and services market in Austria, 7.9 billion AS are attributed to training and consulting (5 billion AS) and hardware maintenance (2.9 billion AS).

Siemens' Program and Systems Development (PSE) subsidiary is the largest software firm in Austria with 2500 employees and 1990 sales of 2.3 billion ATS. This is in comparison to the entire software market of 4.4 billion ATS.

The strong expansion of the software market and the high qualifications necessary for employment has pushed the average wages to 390,000 AS per employee in 1988. Personnel expenses make up 60% of the total expenses for the software firms in Austria. Further, training per employee averages 20,000 AS in 1988.

The increasing complexity of technology and size of the software houses is raising the barriers to entry. In particular, investment volume for firms with employees between 10 and 19 employees stands at 1 million AS per firm. The seven largest firms had 485 million AS in investment in total, thereby making up over 50% of the total investment for the industry in Austria (70 million AS per firm).

The software industry in Austria is confronted with increasing competition, new technology, and the creation of the European common market in the future. Growth is expected to continue in double digits, possibly at the European average of 19%.

Increased competition in software is expected also from the consulting firms, the accounting firms, and the advertising agencies. Increased involvement in foreign markets by Austrian software firms, especially in the Eastern European market, is expected to increase competitiveness in preparation for the EC common market.

International Aspect

Software, the fuel which runs the engine, has continued to reinvent itself since the information technology revolution in the early 80s. As of 1989, software and related

computer services generated 135 billion ECU, of which a quarter was generated in the EC. Not surprisingly, the development and production of computer software is controlled by the hardware producers. The ten largest firms have a market share in Europe of 60%, of which only two of the firms produce software solely. Of these "purely software" producers, alliances with hardware firms have already diminished their marketplace power considerably.

The leading european software producer is the french firm Cap Gemini Sogeti. Integrated with Compact Data Systems, Systemation Inc., Accept Data, and Apsis, and United Research, Cap Gemini's sales of one billion ECU in 1989 were larger than the combined sales of the two most important competitors in the EC, Finsiel and Sema, and is expected to become even stronger with Daimler Benz as a stockholder.

The average annual growth of the software market in western europe is estimated at 15 to 20%. The market for software packages and customer-specific software is expected to increase from 20 billion ECU in 1998 to 54 billion in 1994. Groupware, software which links individual PCs into networks, is expected to continue to grow at an exorbitant pace. Some say that Groupware will be to the network systems in the 1990s what software was to the PC in the 1980s. Server-application sales are expected to grow to over 4 billion ECU in 1996 from under 500 million ECU in 1991 in Europe.

Increasing competition and saturation of the markets is expected to restructure the market. Strategic alliances, cooperation, and takeovers are expected to be prevalent in the software market of the 90s. Middle-size firms are expected to be either bought out or go out of business, leaving only the large software/hardware producers and the small niche-software outfits.

iii) Advertising and Trade Shows

The umbrella category "Advertising and Trade Shows" realized dramatic change across the board between 1983 and 1988. With the exception of the number of employees, average annual increases were in double-digits for the period:

Advertising and Trade Shows in Austria

	1983	1988	% CHG
Number of Firms	2,545	3,987	11.5
Employees	16,840	25,657	8.2
Self-Employed	13,815	22,098	7.9
Value-Added	6,864	11,865	11.7
Investment (mio. ATS)	822	2,235	12.5
Personnel (mio. ATS)	3,506	6,924	14.0

Meanwhile, firm size remained relatively stable, but increases in personnel expenses and investment, among other things, contributed to overall improved productivity (see following page).

**Firm Size/Productivity Statistics
Advertising & Trade Shows**

	1983	1988
Size of Firm		
Total Employees Per Firm	6.3	6.4
Non-Self-Emp. Per Firm	5.4	5.5
Net Value-Added per Firm (in thousand ATS)	2,380	2,780
Personnel Expenses per Firm (in thous. ATS)	250	310
Productivity		
Net Value-Added per Employee (in thous. ATS)	380	430
Personnel Expenses per non-self-employed Employee (in thous. ATS)	250	310
Value Creation Quota (%)	42.8	41.2
Investment		
Investment per Firm (in thousand ATS)	320	560
Investment Rate (Net VA)	13.6	20.2
Investment per Employee (in thousand ATS)	50	90

Advertising

There are approximately 550 advertising agencies in Austria, from which the 25 leading firms generate over 75% of the sales. Half of the revenues come from a group of 100 clients, and the 10 largest customers account for 16% of total advertising revenues.

The largest proportion of advertising revenues are generated by newspapers with 33%, followed by television (27%), magazines (21%), radio (12%), and posters/displays (6%). Advertising share in television and displays have displaced by increases in magazine advertising. Daily newspapers and radio shares have remained constant.

The "Big Seven" advertising firms at the present moment in Austria are GGL, Demner & Merlicek, Saatchi & Saatchi Wien/Linz, Lintas-Austria, Ogilvy & Mather, and Wirz. Each firm averages a net profit of more than 100 million ATS. As indicated by the firm titles, the international concerns are well-represented in Austria, serving as domestic offices for Austria as well as springboards into Eastern Europe. GGK, the largest Austrian advertising agency, is a domestic concern with a total 73 employees in Salzburg and Vienna. GGK's advertising budget in 1990 was 810 million ATS; net profits were 120 million ATS.

Overall, the advertising agencies yielded an increase of employment from 1985 to 1988 of 8%. However, since the number of firms increased at a 11.5% rate, the

average number of employees per firm decreased from 4.8 to 4.4 for the period. Meanwhile, personnel expenses reached 340,000 ATS per employee, and training/education ranged from 1,000 to 6,500 ATS per employee.

While advertising cannot be considered a capital intensive business, investment nevertheless increased from 330 million ATS to 470 million ATS for the period, respectively. In 1988 investment per firm averaged 270,000 ATS, or 60,000 ATS per employee.

As a result of expansion into the east and into the consulting branches, investment is expected to increase in the near future. Increasing trends towards public relations and direct mail is expected to continue. Meanwhile, strong divisions between the large international firms and the smaller firms are expected to become more noticeable. Comprehensive marketing programs from conception of the product to sales is continue to be the direction of competition.

International Aspect

The international advertising market is dominated by the large international advertising firms with branches spread out throughout the world. In total, advertising generated 45 billion ECU in the EC, 25 billion ECU in Japan, and 70 billion ECU in the United States in the 1989. In the 80s the advertising market boomed with growth in double digits. Growth was a factor of the increase in "consumerism," increased firm profits, intensification of competition and the availability of commercial media. As a result, the market expanded significantly: in the EC advertising as a proportion of GNP increased from .7% in the beginning of the 1980s to 1.1% at the end of the decade.

In recent years the advertising industry has realized a large amount of restructuring. Because the advertising market in recent years has been a slowdown in Europe, advertising agencies have been expanding into consulting and market research. Further, a large amount of mergers and acquisitions have taken place in the past 5 to 10 years. Saatchi & Saatchi in particular has followed an M & A strategy for the past 10 years, and five of the ten largest advertising firms in 1980 have been victims to takeovers. However, since Saatchi & Saatchi's financial problems, the M & A activity has come to a halt. Nevertheless, with the ascendance of the common market in the 90s, M & A activity is expected to resume, and the concentration of firms will become tighter.

Market Research

The market research industry in Austria is characterized by a few large organizations and many small firms. In 1990 market size was estimated at 665 million ATS with 670 total employees - i.e. sales of almost 1 million ATS per employee. While our interviews did not yield figures on personnel salaries, training and education was reported to be 5,000 ATS per employee annually.

The trade is represented by the Organization of Austrian Market Research (VMÖ),

representing over 270 members including market research institutions, corporate market research departments, advertising agencies, and university market research departments.

Since 1986, the market research industry has grown at a rate of 9% annually. 1988 and 1990 realized growth rates of 13.7% and 12%, respectively, while the average in the past 5 years has been 10.3% annually. The dominance of the large firms is demonstrated by the fact that the five largest firms make up over 70% of the industry's sales volume. A.C. Nielsen, a wholly-owned subsidiary of the U.S. firm A.C. Nielsen, is the market leader in Austria with 190 million ATS in revenues in 1989 (that is 30% of the market and 300 total employees). Meanwhile, Fessel and GfK are half the size of A.C. Nielsen. IMAS, Gallup, and IFES reported sales in 1989 of approximately 50 million ATS.

The important customers for market research in Austria are the brand goods industry, which is responsible for 61% of the business. Unilever, the British/Dutch concern, is the largest advertiser. Meanwhile, the media and communication industry is the second largest customer (13%), followed by the financial/insurance sector (7%) and public sector (6%).

The most important market research services are classical surveying and interviewing services, consumer panelling (now being computerized with the use of debit cards and scanners), and consulting, in which the firms provide answers in addition to the data. The classical surveying and interviewing services have been declining as a percent of revenues - from 1985 to 1990, from 65% to 54% (The surveying techniques are dominated by the personal interview (43%), followed by trade research (38%) and telephone interviews). Meanwhile, consulting now represents one-fifth of the total business.

The IWI-telephone survey indicated an average annual investment of 30,000 ATS per employee, with large firms (more than 20 employees) investing 60,000 ATS per employee. Investment was mainly financed by the firm, and was in the form of computers and communication equipment.

Overall, market research is a fastly growing market in Austria. With limited barriers to entry, an increase in the number of small firms is expected. Entrance of Austria into the EC will further increase competition. Austria firms are preparing for this increase with stonger employee education and expansion into public relations, marketing, advertising, and personnel businesses.

International Aspect

Market Research is a relatively new business function. Very few market research firms are older than 40 years old, and most were founded in the beginning of the 1980s. Through the low barriers of entry there is a high rate of fluctuation, especially amongst the smaller market research firms.

Since the 1950s the market research area has grown steadily. In 1989, the global

market was estimated at 5 billion ECU, of which the EC and the United States comprised 75%. Growth, caused by the inception of the EC common market and the addition of new customers from financial services, retailers, non-profit organizations, and the public sector, is expected to continue at 10% per year. Further, in the future the market research industry is expected to become more concentrated as a result of mergers and acquisitions. Therefore, the optimal size for the market research firm is expected to increase.

Trade Shows and Exhibitions

In Austria as in any country, many different kinds of firms are involved in the trade show value chain - engineering firms, advertising firms, PR firms, and government authorities. Trade show firms are in most cases controlled by the government, either contractually or directly.

While there is no reliable statistic concerning the number of employees involved in the trade fair industry, the average trade fair organizer employs between 5 and 50 employees. The Vienna Messe, for example, employs more than 500 people. In Austria, 200 regional and 60 national specialized and "universal" exhibitions took place in 1991. The largest trade fair organization, the Arbeitsgemeinschaft Messen (AMA), organized 60 fairs in 1990.

The trade show business in Austria has not yet reached its potential. As a result, it is expected that Austria will invest in trade show facilities at an increasing rate in the future. Already, the city of Linz is building a new Congress and Exhibition Center with 9000 meters squared. Vienna plans a modernization and improvement of traffic connections to the Exhibition in the Prater region, with investments of over 1 billion ATS by the year 2020. Further, St. Pölten plans to build an exhibition center.

As a result, trade exhibition firms are expected to grow at a rate of 10% per year. Adding particular thrust to the increase is Eastern Europe, who do not have the modern facilities to have a western-style trade show. Viennese firms will also have a hand in planning exhibitions in East Europe - the Hungarian Expo, for example, is a 50% joint venture of ECI (Exportconsult International), an Austrian concern.

International Aspect

Trade shows are becoming an important tool for the marketer to present new products to the trade and to the public. In almost every land, city and state governments are discussing proposals to build new exhibition facilities to attract trade shows to their cities.

Approximately 2,000 trade shows occur per year, of which 1,200 alone take place in Europe. The most important trade show locations are located in Europe, although Chicago, Atlanta, Tokyo, Hong Kong, Singapur, and Kuala Lumpur are increasing in importance as trade show locations. As a result of the climbing competition, investment has been climbing. Every year 140 billion ATS are invested worldwide, yielding an increase in a worldwide hall capacity from 5.4 to 6.5 million square

meters. Vienna has 112,000 square meters of space available, thereby ranking it 20th worldwide. Hannover, however, has the largest hall capacity with 472,000 square meters.

The strong competition and expansion into other worldwide locations is attributed to the increasing internationalization of the world economy and the increasing cooperation worldwide. However, only 150 of the 2,000 trade shows can be characterized as international trade shows. The main clients of these trade shows are the multinationals.

Conclusions

As a result of our analysis, a few generalizations can be made concerning the Austrian market and the "new" industrial service sector. First, regulation in Austria is too rigid. Austrian laws are very strict in controlling the performance of services. As a result, the rigid framework hampers development of the service sector, and limits the supply of services available to the producers. This in turn passes inefficiencies to the producers.

Second, the average size of the Austrian firm is too small. Firms tend to remain significantly under the 20 employee bracket. Therefore, with the few international service concerns over the 50 employee plus bracket, there is a "hole" in the size bracket of 20 to 50 employees.

Third, while employment and skill needs are ever-growing, the labor market remains sporadically segmented between highed-skilled jobs and low-skilled jobs. As a result, the term "pink-collar" labor, which is used often to define the skills of the traditional producer services, is also prevalent amongst the "new" industrial service firms.

Fourth, the dependency upon foreign parents companies, especially in advertising, is high in Austria. While this can be intimidating for domestic development, it should be noted that the international firms are less effective concerning local tastes and tailorization of services to the domestic client.

Lastly, because services produce intangible "products," financing is very different for service firms than financing for manufacturing firms. The goods-producing firm has the necessary collateral in order to obtain its financing via traditional capital sources. Service firms, on the other hand, have very limited or no collateral. Therefore, financial incentives have to be in place to promote lending to the service industry.

C. Case Studies

Because of the aforementioned problems with official statistics on services it is useful to add further insight into the tertiarization phenomenon by way of case-studies. The following case-studies concern machine-building, paper and lighting industries.

1. Machine-Building Industry in Austria

There are a total of 453 firms with over twenty employees in Austria's machine building industry. The industry can be divided into three product categories: factories, machine tools, and pumps. Since the industry can be characterized as heterogenous in nature, it is difficult to compare firms directly. Nevertheless, we surveyed six firms in the machine tool industry: Emco Maier & Co., Actual, Pumpenfabrik Ernst Vogel GmbH, Maschinenfabrik Heid, Grill & Grossmann OHG, and Schelling & Co..

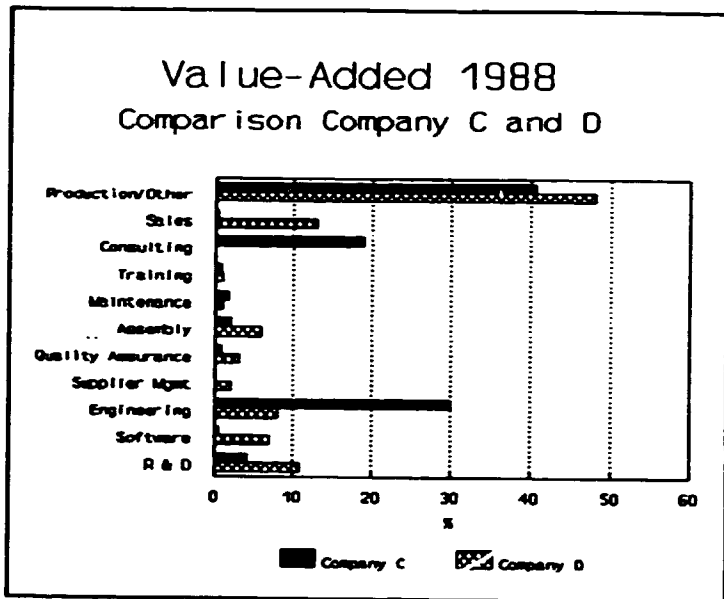


Table 10

Aggregate Comparison

On the whole, the percent of employees working in service positions for machine tool firms ranged from 13% to 30%. Results were different among firms concerning the question "what percentage of employment do you expect per function in 1988 and 1992?" For example, Company A and Company C expect decreases in production of 9% and 10%, respectively, mainly attributed to increased automatization, whereas

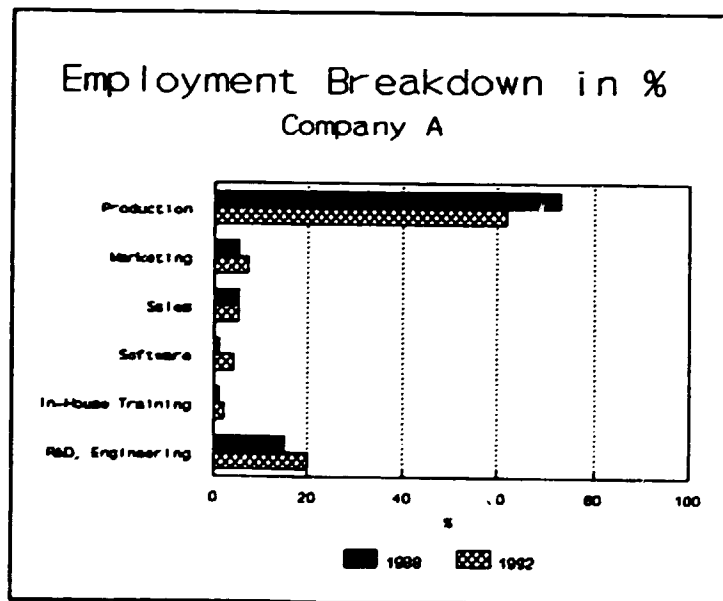


Table 11

Company B expects the percentage in production to double in four years (see Tables 10 through 13).

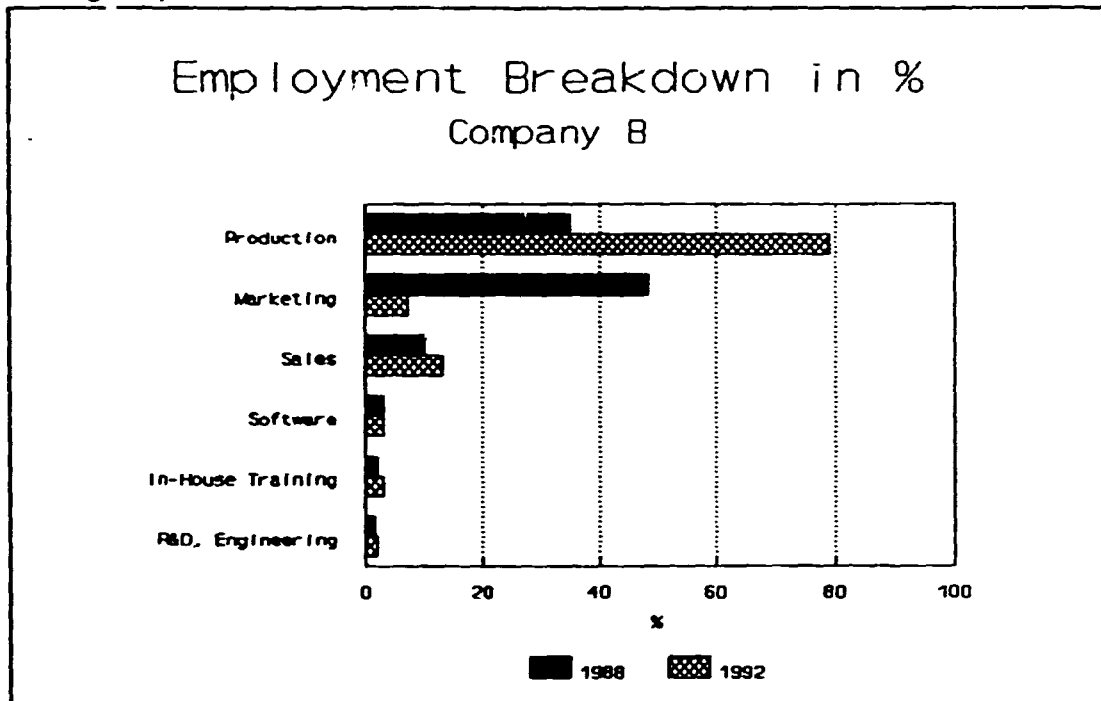


Table 12

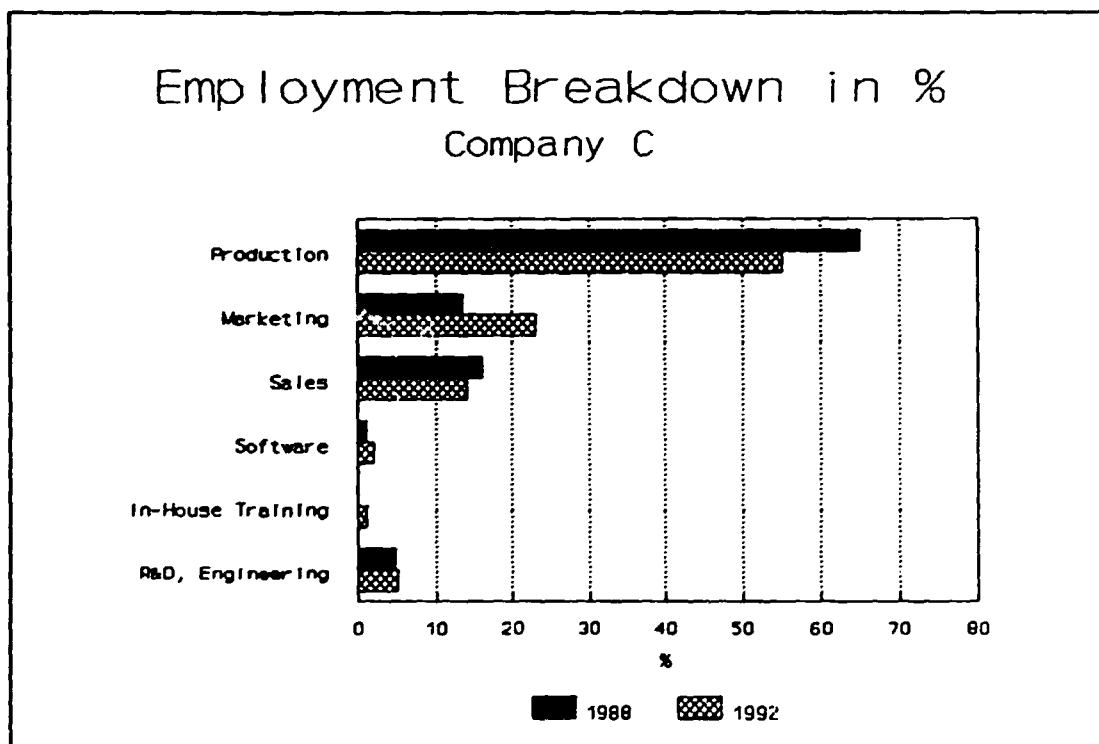


Table 13

The percent of sales for the different services branches can be characterized for the

surveyed firms in the following ranges:

Engineering	5% to 20%
Software	5% to 10%
Customer Svc/Consulting	1% to 12%
Research & Development	3% to 7%
Other	.1% to 3%

Emco Maier & Co

With sales of approximately one billion Austrian ATS in 1989 and an R & D share of 5% of sales, Emco's main focus is on service. Emco's product is not only lathe machines, milling machines, vertical tool cutters, wood cutting machines, laser cutting machines, and hardness-testing machines, but complete comprehensive systems to the customer - software, hardware, engineering, and customer training. Services are in effect Emco's main product.

Employing 900 people in Austria and 200 in foreign countries (approximately 82% of revenues come from exports), Emco follows a strategy of tailoring the product to meet the specific needs of the customer with the most advanced technology. Emco's traditional product, the machinery itself, makes up only 20% of total revenue. An additional 40% of revenue comes from the machinery driving the industrial application (i.e. automation) - CNC-technology. Also included in this figure is the software for automation, which is sourced 100% from Siemens and Fanuk. The remaining 40% of Emco's revenue is generated from Education and Training machinery, of which 10% represents software (more on this later).

Competition in the machine-building market is on the rise. In manual machines, increased competition is coming from the lower-wage developing countries in South Asia and South America. Meanwhile, competition in the automation market is coming from the United States and Japan. As a result of increased competition, product life cycles of 5 to 8 years are expected to decrease in the future. However, because of the complexity of the product, Emco needs a product life of at least 3 years to recover research and development costs. Therefore, a source of prolonging product life has been software updates.

A unique product development at Emco has been the training machinery, which is supplied to occupational training institutions. The training machinery is a complete system, which includes the traditional machine, control hardware and software, robotics, personal computer, CAD/CAM, graphic simulation, and training materials. In the training machine market, Emco enjoys a 33% market share worldwide and 85% market share in Austria alone.

Emco also offers training courses directly to the customer. Such courses include a beginner course in CNC-technology, CNC software training, and system maintenance. The courses are offered in schools located on the firms premises.

A key strategy has been to maintain close contact with the customer. In fact, the firm has 4 wholly-owned foreign subsidiaries set up abroad directly for this purpose. By working close with the customer, Emco is able to monitor the customer's environment and to discover new development ideas. Further, with engineering's close association to the customer, the department has been able to sell engineering services directly to the customer (as opposed to dedicating services solely for internal company purposes).

While Emco is relatively small compared to the competition, it has been able to overcome this disadvantage by concentrating on the market niche strategy. Tailored customer solutions, close customer contact, a stream-lined decision structure, and advanced technology has been Emco's strategy.

Actual

Actual has effectively partitioned the market between the products it offers and the "turn-key" operational services it provides to its customers worldwide. Actual Holding is the holding company for Actual Fenster (window) and Actual Maschinen- und Anlagenbau (machine and factory building). The firm was founded in 1970, and began with the manufacture of synthetic window frames. Later, the firm began machines and tools for manufacturing the window frames, as well as the soldering machinery. Now the firm supplies the complete system of automation, notably the software, hardware, and the "flexible" machinery.

The firm employs a total of 440 workers and generates sales of 500 million AS. The employment and revenue figures are approximately evenly split between the two divisions. The total R & D proportion to sales is reported to lie between 3% and 4%. 50% of machinery revenues are made in complete machine system sales. The other half of machinery revenues come from individual stand-alone machinery.

The firm attributes its current success of machine system sales to the development of software. Without the software, the sale of hardware and machinery would drop considerably. Services included in the total value chain include:

- . The firm provides the customer the necessary know-how for producing the synthetics, particularly the correct temperatures and the raw material inputs;
- . Feasibility-studies included with customers letter of intent;
- . CAD-system software used internally for the construction of the factory or machine system. The software is supplied from Hewlett Packard and Techsoft;
- . Licensing of know-how to customers;
- . Assembly of machinery systems, which can last up to 3 months;
- . Training for customer, both a time of sale and later in use;

- . Development of machine control software;
- . Quality-Assurance.

As software continues to grow as Actual's most important business, the firm has been experiencing problems with finding qualified personnel to develop the software. The development of software as a periphery-hardware product has produced significant barriers to entry.

Pumpenfabrik Ernst Vogel G.m.b.H.

"Vogel Pumpen" has erected serious barriers to entry in the worldwide pump industry by offering a wide array of high quality service not only at the point of sale, but also before- and after-sale planning, engineering, maintenance, and consulting.

Founded in 1909, Vogel Pumpen produces pumps in four product categories: industrial technology, household technology, cooling machinery, and factory construction. Products include low & high pressure pumps, submersible motor pumps, water supply works, sewage salvage machinery, swimming pool technology, heat pumps, heat exchanger and sun collectors, cooling machines, hydroelectric control gear, and so on. Vogel is Austria's leading pump manufacturer, offering not only equipment but also the software, hardware, and services that go along with it.

Vogel has manufacturing facilities in Stockerau and Wels, with sales and customer service offices scattered throughout Austria. Fifty percent of revenues come from exports abroad. Vogel's most important market in Hong Kong and China, where "Vogelpumpen," the brand name, have a 50% market share.

Vogel provides countless number of pump and pump combinations. As a result of the know-how retained within Vogel, the firm is involved in planning and engineering services to clients. Since most clients are planning bureaus, Vogel's consulting services enhance the services of the planning bureau. Therefore, total planning know-how is not often sold in entirety.

In terms of competitive strategy, Vogel follows a high performance-high price strategy with the philosophy that the high effectiveness and durability of Vogel's pumps will pay for itself in the long run - thereby being more economical than the cheaper alternatives. The future success of Vogel's products depends upon its ability to customize the products to customer needs. As expected, customization requires not only flexibility of the base product but extensive personalized services.

In terms of value-added, planning contributes a maximum of 15% to 20% to the total value-added of the machine works. The engineering contributes 30%. Planning and engineering are done in Vogel's "Construction Research & Development" department, which employs a total of 8 employees. Meanwhile, software programming is done in two departments: the pump control software development department, which employs 3 employees, and the R&D department, which employs 15 employees. In total, R&D makes up 3% of the firm's annual expenditures.

The firm's foundry, in which all large pumps are formed, is where customer specific tailoring and 30% of the casting takes place. Since this is where the client customizing takes place, this is where the bulk of know-how lies. The other significant proportion of know-how is required in the finishing area, which is highly automated and requires extensive software services. Both areas require a high degree of services for their own purposes, namely planning and engineering.

Services available to the customer include training, machine maintenance, and financing. The sales and customer service area, employing about 50 employees, is very personal-intensive. Each office has a PC with an installed program-system which guides the planning and calculation of installation easily and effectively. The hardware is purchased from the Firm Bull, the software developed in-house by Vogel, as is an installed database (often up-dated). This software system alone contributes 19% to Vogel's value-added, and 12% to revenue.

Training, which lasts for 2 to 3 days, is provided free, and gives Vogel additional advertising leverage. Financing is provided in conjunction with banks, which provide special leasing packets.

Vogel's future plans are to branch out into a new field, environmental technology.

Schelling & Company

Schelling produces specialized machinery to cut wood, synthetic, and metal sheeting. With a 50% market share of this market worldwide, the Vorarlberg/Austrian firm is an outstanding example of a company that has used services to outstrip the competition.

A preoccupation with the customer is considered the organization's overall philosophy to success. Under the premise "Nutzen Schaffen" ("create" and fulfill needs) -- for the customer first, and for the employee, the firm, and the community second -- Schelling has placed services at the heart of its competitive strategy.

As a result of the complexity of the problems and the advanced technology involved, the need for services to the customer in the special machine market is very high. However, Schelling doesn't want to provide the additional customer services in the classical sense, but high value services which add value to the customer's product as well as is profitable for the firm. The firm's goal is to reach a 50% level of sales for services within the next ten years.

The services Schelling provides are unique and in some cases against the industry standard:

- o guarantees its products for a duration of 30 years, versus the 10 years standard.
- o provides 24 hour repair service worldwide. In the US, repair calls can be answered in just a few hours since the North Carolina subsidiary has a corporate airplane.

- o has a telephone help line, which is supported by a computer diagnosis system.
- o as a strictly controlled company policy, sales engineers are required to spend 50% of their time with the customers, thereby providing personalized consulting and sales services.

As a result, Schelling does not just offer saws. Schelling offers a complete system, automated with an "Optimizer" office computer, a "Commander" machine computer, and the software developed in-house. Overall, the comprehensive system had excellent benefits to the customer - lower material costs, lower personnel costs, and better planning.

With 436 million ATS in sales in 1991, the company employs 380 people and has an R & D quota of two to three percent of sales. Of the total revenues, 82% come from exports. One-Third of the total sales come from the United States, where Schelling no longer has a competitor.

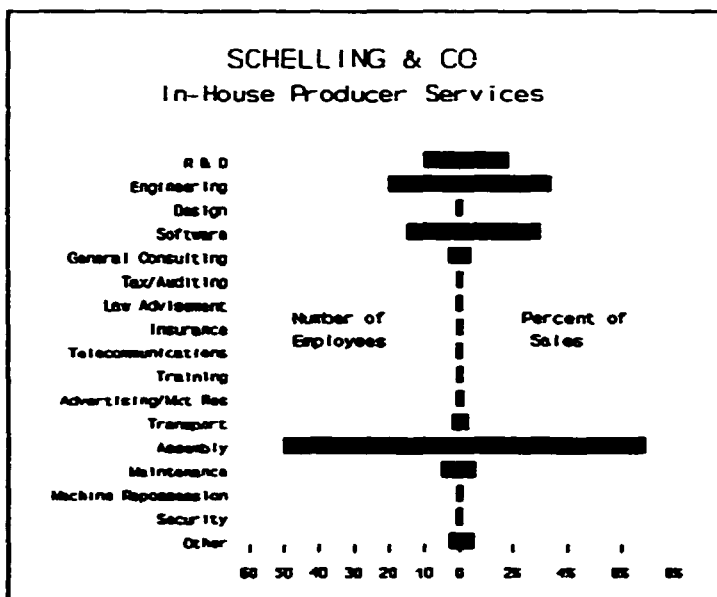


Table 14

According to the survey, of the services provided in-house, total expenses for Research and Development, Engineering, Software, and Assembly make up the largest proportion of the number of employees and the percent of sales (see Table 12).

Table 13 and 14 indicate the breakdown of in-house and out-of-house produced-services which were produced either for Scheller's own purposes and sold to others. Schelling's five sourced-out services are

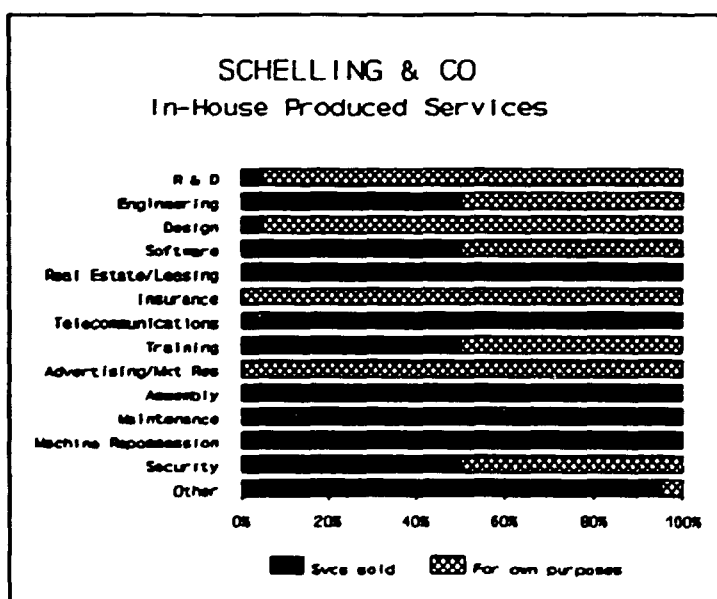


Table 15

design, management consulting, tax accounting and auditing, legal services, and transportation. In all cases the services are sourced-out for Schelling's own purposes, with one exception - transportation, which is sold directly to the customer.

The reasons for out-sourcing are:

Design - the production, costs, capacity, professionalism, and customer closeness were all considered "important" (survey question ranking 1 as "very important," 2 as "important," and 3 as "unimportant") reasons to source out for Schelling.

Management Consulting - production and professionalism were the only two reasons, characterized as "important" to Schelling.

Tax Accounting and Auditing - Production was considered an "important" reason, whereas costs, capacity, and professionalism were all considered "very important."

Legal Services - Legal services received the same reasons as tax accounting and auditing.

Transportation - Schelling listed all the variables - production capability, costs, capacity, professionalism, customer closeness, and "other," as reasons for out-sourcing transportation.

Lastly, concerning the question concerning a planned investment in Production Hardware, Schelling responded that an additional 35% investment in Software. The breakdown of the investment in software would be 40% installation, 30% training, and 20% software.

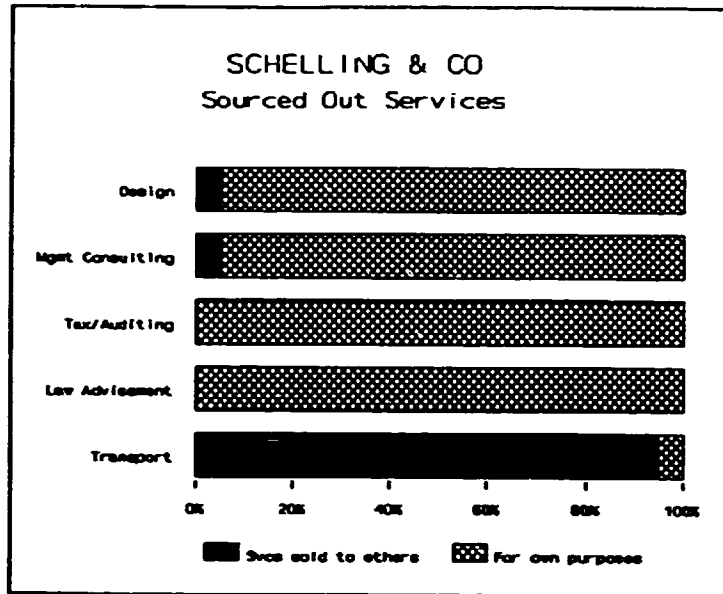


Table 16

2. Paper Industry

Mosburger AG

"Unser Weg zum Erfolg. Wir sind für unsere Kunden da. Nicht umgekehrt." The slogan - "we are there for our customers, and not vice versa" - is considered by Mosburger as their "way to success." Mosburger sees itself not as a manufacturer of corrugated cardboard and boxes, but as the problem solver for its customers. A "customer orientation" and "application support" are key phrases in the Mosburger operation. However, unlike many firms which attempt to bring a customer/market/quality focus into the corporate culture, Mosburger backs up its corporate slogans with real results.

Mosburger produces the paper, corrugated cardboard, boxes, cartons, and paper pallets to package anything from Philips lightbulbs to large industrial equipment. The product brands themselves exemplify Mosburger's customer attitude. As opposed to factory order numbers or bland industrial titles, Mosburger innovations have titles such as "Ready-Box," "Uni-Pal," and "Quick-Zip." Mosburger "systems" are based upon improvement: no product is optimal - products should be in continual evolvment. Formal R & D, which is only .3% of sales, is not the sole source of innovation - everyone in the organization is expected to contribute to the quality of the Mosburger system to the customer.

With 375 employees, 3 production facilities, and sales of 902 million ATS in 1991, Mosburger exports 33% of sales abroad. Boasting 100 years of know-how, Mosburger spells out what it means by customer service in an employee handbook. For example, for sales representatives and order-takers:

- o correct clarification of all contract details;

- o take all wishes and problems of the customer seriously;

- o offer expedient solutions;

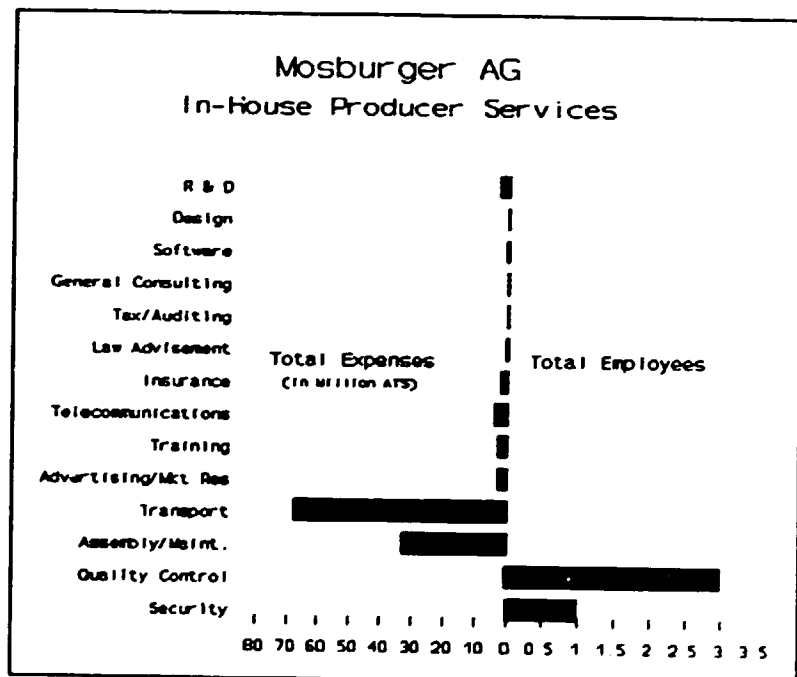


Table 17

- o friendly and helpful telephone service;
- o always follow-up with written correspondence to the customer.

Nevertheless, the use of producer services by Mosburger is predominantly contracted to outside companies. With the exception of R & D (100% in-house), assembly (32% in-house), and maintenance (also 32% in-house), all producer services are contracted outside the company. All producer services are for Mosburger's "own purposes" with the exception of design, which the firm claimed was 100% for "customer purposes."

Mosburger gives the following reasons for out-sourcing:

Service -----	Reason(s) -----
Design	Professionalism
Software	Cost, Professionalism
General Consulting	Technical Complexity, Cost, Professionalism
Tax/Accounting	Professionalism
Legal Advising	Professionalism
Insurance	Customer-closeness
Telecommunications	Customer-closeness
Training	Complexity, Professionalism, Customer-closeness
Adv./Mkt Research	Complexity, Professionalism, Customer-closeness
Transport	Cost, Capacity, Professionalism
Assembly/Maintenance	Cost, Capacity, Professionalism
Janitorial Svcs	Cost
Security	Cost

Of the workforce, 66.2% are considered "blue collar." Of the 33.8% "white collar" workers, .6% and 4.2% have doctorates or college diplomas.

3. Lighting Industry

Zumtobel AG

Zumtobel AG is a market leader in Europe in lighting systems and light components. With approximately 2400 employees, the firm generates 4 billion ATS in revenues per year. The success of the firm has been a result of exemplary technology and continual product innovation, and particularly Zumtobel's preoccupation with services. These services, which add enormous value to the final product, are expected to grow in importance in order to maintain Zumtobel's competitive advantage and market leadership in the industrial lighting market. Particularly interesting concerning the Zumtobel case is the various combinations of hardware and software produced for the customers. However, as an outsider, one gets the impression that product development is the result of market and production conditions, and not the result of anticipatory strategic planning.

By the beginning of the 1970s Zumtobel started to use computer programs to plan lighting systems. However, the breakthrough with the so-called "Cophos-Program" did not take place until the mid-1980s. The program did not only integrate the sales force with development and production, but was also used for customer training (i.e. for electricians, architects, planners, and wholesalers). Further, the software was also sold at the time as a product in its own right. Therefore, the software product has been transformed from technical planning to also include marketing and sales applications in addition to customer training applications.

Zumtobel concentrates on reaching a higher level of customer loyalty and product differentiation through integrated software. Further, the software is also employed as a customer "filter" - the expensive customer hotline is available only for customers who have completed the Cophos training program.

Newer services continue to be created, such as CAD applications (lighting simulations with VisuCAD), electronic catalogues, and customer information software. The customer information software allows Zumtobel to react very quickly to customer inquiries - application know-how is stored in a ready-accessible database.

Although there are only six people in the Cophos-Software department, the service function is nevertheless important. The most important aspects are highlighted as follows:

- o Instrument of Planning Efficiency and Standardization
- o Added-Value to Hardware
- o Marketing Tool - - Customer Loyalty
- o Market Segmentation and Advantages of Price Competition

- o Barriers to Entry - notably through the creation of software
- o Improvement of Technical Designs
- o Instrument of Training
- o Improvement of After-Sales Services
- o Additional Stand-Alone Software Product
- o Increased Quality of Hardware and Creation of Brand Name
- o Build-Up of Human Resource Capital/Know-How
- o Decreased Reaction Time - via feedback from customers i.e. close customer contact
- o Total System Solution for Customers

4. Concluding Remark

In today's industrial sector, hardware is still a very dominant proponent to the end product. However, an increasing proportion of the input factors, whether produced in-house or contracted out, are becoming devoted to services. In effect, the movement towards services can be explained as follows. First, the product is developed as stand-alone hardware. Then, after-sales services are added, followed by services as a "new product," and lastly services as a major portion of the firms business. Through this cycle of evolution, the firm achieves the following within the marketplace:

- o exposure to labor cost-competition is reduced
- o entry barriers are established
- o new product/service lines are developed
- o new markets are penetrated
- o closeness to customers is improved

IV. Trends To Be Observed and Likely Impact on Policymaking

Given its size and mix of products and services, Austria is an interesting case for the purposes of understanding the development of the industrial service sector. In particular, the case of Austria enables us to detect trends and patterns which can help to understand the economic developments in other countries.

The importance of the growth of the industrial service sector in complementing the intensification of the manufacturing sector can be considered a major postulate of this paper. The services used by the industrial sector make up a significant portion of real value-added. While Vogel Pumpen's software systems alone contributed 19% to the firm's real value-added, Emco's claimed an 80% contribution of services to real value-added. According to Joe K. Carter of Andersen Consulting Inc., the knowledge of how manufactured goods are built and how they work makes up 70% of their development costs (Schwartz and Treece, 1992, p. 48).

Services are interesting because consumption and production occur simultaneously. However, because of inadequate accounting practices, it can be difficult to quantify the full impact of services. The multiple standards of treating intangible assets as well as the intermingling of production and service costs within the balance sheet results in the inability to delineate the structural relationship between manufacturing and industrial services. Therefore, certainly a recommendation would be to gear up the standard of firm-specific and national accounting. As a result, awareness of the importance of services would be the consequence, as well as better decision-making and improvement of efficiency. As long as the data continues to be of poor quality, recognition of the manufacturing-services division of labor will be seriously biased. In addition, the idea that "benchmarks" pertaining to the role of services within economic processes will continue to be overly-ambitious as long as companies do not know the costs of service input, do not calculate the service content of the end product and, consequently, are unable to give an adequate price target in the invoice.

Nevertheless, the statistical data concerning Austria produces interesting results, particularly with regard to its level of tertiarization. At over 60% of Austria's nominal gross domestic product, Austria's tertiary sector is in its early stage of maturity. In comparison to other OECD countries, Austria is ranked 18th of 24 countries in terms of "tertiarization." While the tertiary sector is growing significantly greater than the country's aggregate real GDP, Austria's low ranking in comparison to other OECD countries indicates that many services are still being performed inside the manufacturing companies, and hence there is only a limited market for sophisticated service companies.

As a result, the service firms that do exist are relatively small. For example, the average size for engineering firms and advertising firms - 4.0 and 6.4 employees, respectively - is significantly below international standards, and indicates that services are being performed at or below the minimum level of efficiency required to remain competitive.

A suboptimal level of efficiency leads to a high "death rate" of start-up service

companies. Many newcomers try to enter a basically very dynamic market, and after an initial growth period, they face tough financial, management and sales problems. Only after having gone through a stage of consolidation do more healthy and bigger survivor firms re-emerge. Therefore, in Austria the distribution of the number of service companies is typically U-shaped, with a "hole" in the size-bracket of 20 to 50 employees.

Various reasons can be given for Austria's lower level of tertiarization in comparison to other industrialized economies. The strongest argument is the statistical reasons described above. Because of the lack of international accounting uniformity, accounting treatment for services are different in every country. As a result, the statistics for comparison purposes are less than optimal. A second reason for Austria's lower level of tertiarization is the content (i.e. degree of externalization) of services performed. Basically Austrian firms have a lower level of externalization of services, and thereby perform a large degree of services in-house. Lastly, Austria's lower level of tertiarization relative to other industrialized countries can be attributed to residual reasons, such as size of the market, size of the firms, and so on.

To overcome Austria's low level of tertiarization relative to other industrialized nations, a revamping of accounting standards in the direction of international standardization is certainly on the top of the list. However, there are some changes that can increase Austria's level of tertiarization in real terms. The first concerns regulation. Regulation in Austria tends to be too rigid and hampers the development of industrial services. Existing service firms in Austria, for example, build barriers to entry by influencing government to design laws to impede market entry. While the laws may be simple in design, the time and know-how required to meet the laws can discourage investment. Therefore, changing current regulations to encourage investment and externalization of services is a necessary step for further tertiarization.

As mentioned earlier, the size structure of the firm has to change. In particular, the existing hole between 20 to 50 employees has to be filled, and the number of firms at the size 10 to 20 employees has to increase. In effect, the small one- to five-man engineering bureaus and market research agencies have to increase in size to surpass the minimum level of efficiency of services required for international competitiveness.

Further, skill levels have to continue to improve. Formal training, especially for engineering, consulting, software, and accounting services, is an important requirement to feed these labor requirements. However, lower levels of training and education are also important requirements to the advancement of the "new" industrial services. These requirements, similar to the training requirements of "pink collar" labor in traditional industrial services, are necessary more for the "industrialized" or "standardized" industrial services geared towards high volume mass distribution.

To the entire service sector, financing is also a major issue for further tertiarization. One can expect that in the future, the capital-intensity of service companies will increase, mainly due to the increase of computer equipment. For a manufacturing firm, venture capital financing would be the most appropriate form of financing. However, financing intangible investment and services is more than just conventional venture finance. Service companies typically are not clients welcomed by bankers for commercial loans.

Thus, some public guarantee for such loans seem to be unavoidable under a risk-sharing device, and therefore necessary for the advancement of Austria's "new" industrial services. This often goes hand in hand with tax benefits or temporary tax exemption. It should be clear to banks however that loan repayment schedules should be made a function of cash-flow, which can be very dynamic for successful service firms.

Lastly, Austria's service sector, particularly the new industrial services, have to become less dependent upon foreign parent companies. There is no doubt that the increased intensity of international competition in services may be intimidating to countries considering the development of a service sector, particularly Austria. The introduction of many standardized and/or internationalized services (software, advertising, consulting, accounting etc.) through local subsidiaries can be viewed as an imminent threat to the development of a domestic industry, and therefore this threat discourages local investment. However, a major reason for implementing services for the sake of manufacturing is a high degree of localized, tailored solutions for the customer. One cannot always expect that these functions will be fulfilled by the subsidiaries of foreign companies, and it can be argued that an Austrian consulting firm is in better touch with the Austrian market than the local office of McKinsey. Therefore, strong domestic service firms promote local differentiation and consequently creates a niche for the domestic service industry.

To the developing economies, "new" industrial services are especially attractive not only because the level of value-added is extremely high (it is rather the rule than the exception that real value-added in software companies attains levels of 80% to 90%), but also "new" industrial services are high skill labor absorbing businesses. The notorious brain drain would be highly discouraged if domestic sources of employment for high skilled labor was available. Further, the combination of high skill employment combined with average salaries would make the ensuing industrial services both domestically and internationally competitive.

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