

CLOSING THE GAP BETWEEN U.S. AND GERMAN MANAGERIAL ACCOUNTING

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The effect of the continuous process of globalization on management functions like marketing and sales, production, or R&D is well researched. But the forces of globalization are also effective for management support functions. A good example is managerial accounting with its distinct standards and methods in different economies. Managerial, as well as financial accounting, are pretty different in German-speaking countries, compared to the United States. This may be surprising because the goals – giving the public a true and fair view, and supporting managerial decisions – are the same everywhere. Recently, a convergence between these systems can be observed in business practice, triggered by the development of ERP systems, by regulatory requirements, and by changes in management thinking. Our paper aims (1) to explain the deeper economic, legal and cultural reasons for the national differences in the design of accounting systems, and (2) to uncover the driving forces behind the recent development of convergence. In addition to summarizing the relevant literature, we draw from experience in implementing and assessing managerial accounting systems both in German-speaking countries and in North America.

Keywords: International accounting, Design of accounting systems, Integrated accounting, Dual-cycle accounting, GPK system, Resource consumption accounting, Mass customization, ERP system.

Introduction

Internationally active businesses are confronted with the fact that there are national differences in the design of accounting systems. International accountants live with these dissimilarities and accept them as given, although it is actually surprising that such differences exist. They may be explained for the part of financial accounting by legal regulatory interventions, but not for managerial accounting, which has the same set of purposes everywhere: budgeting and calculating the costs of products and services to support management decisions on short-term as well as long-term pricing, on assembling the product portfolio, on in- and outsourcing, and on other operative as well as strategic issues. In fact, the national differences are even greater in managerial accounting than in financial accounting, where the legal intervention is focused on valuation and therefore on the anticipation or deferral of profits between fiscal years while the basic task – providing a true and fair view – and the structure – generally accepted principles, accounts, balance sheet, and income statement – are basically the same everywhere since Luca Pacioli's (1494) description of the double-entry bookkeeping system.

National differences in managerial accounting can be perfectly illustrated with the methodologies in German-speaking countries (Germany and Austria in particular), and in the United States, respectively.

These differences have been researched in the last two decades, and we will summarize them in the next chapter. Academic literature has also described the history of the development of the German GPK-system of managerial accounting, but this analysis focuses on research and development history of GPK rather than on the economic, legal, and cultural factors behind the differences. And surprisingly, academic literature undervalues the main aspect: Accounting in German-speaking countries is characterized by a strict separation of financial and cost accounting, while the US model favors an integrated accounting system.

We propose that economic, legal, and cultural factors are a major reason for these differences. In our model, the reason can be broken down into four most important factors: The **legal system** (Common law versus Civil law), the **preferences in capital procurement** (equity versus debt), the **degree of uncertainty avoidance** (low versus high), and the **fundamental management thinking** (marketing-corporate versus production-entrepreneurial, and mass production versus sophisticated mass customizing).

Analysis of Previous Research

Research on international management accounting has been intensified for the last decades, and there are papers covering various aspects of the distinctions between national designs of accounting systems. We do not give a full literature review here because there are articles with very detailed reviews. Harrison & McKinnon (1999) summarize the cross-cultural research on management control systems since the 1980s and categorize the articles by method, structure of the findings, and cultural dimension according to Hofstede (1980). Chenhall (2003) reviews papers from the same period of time by contemporary aspects of the environment, technologies, and organizational structure. Wagenhofer (2006) analyzes recent management accounting research in German-speaking countries and found a shift from analytical methods towards use of information in organizations, and surprisingly “no tradition of management accounting research under a psychological or sociological view, nor ... of interpretive or critical perspectives”.

Instead, we are focusing on the recent literature that highlights the differences between managerial accounting in the US and in German-speaking countries, and on literature that gives a framework of categories that we can use in our own analysis.

The German/Austrian method of managerial accounting – in the US often referred to as GPK-system – has been developed in management practice since the 1930s and scientifically standardized in the 1950s and 1960s, and it is widely used in a pretty sophisticated manner in corporations as well as smaller businesses of the manufacturing sector until today. The term GPK was apparently introduced by Kaplan & Cooper (1998). In their book “Cost & Effect”, they dedicated a full chapter to the German system of *Grenzplankostenrechnung*, which can be translated as flexible marginal costing, but was addressed by the authors as the “Kilger-Plaut-GPK system”, named after H.G. Plaut and Wolfgang Kilger (ibid.). Plaut was a management practitioner who founded a consultancy for cost management in 1946 and later developed software solutions for cost accounting which became standard in German and Austrian corporations and were later integrated into SAP’s software. Kilger was a German management professor who started a cooperation with Plaut in 1954 and further developed the practical models into a full theoretical concept of cost accounting. Kilger’s (1961) book “*Flexible Plankostenrechnung*” is basic literature for German accounting students until today. In their book, Kaplan & Cooper (1998) research the peculiarities of German cost accounting from the American perspective. They found that the practice of standard costing and flexible budgeting became more widely applied in German companies than elsewhere, allowing a highly structured and detailed approach to cost control. They especially emphasize the high degree of detail in planning, with the use of a huge number of cost centers, and the consequent distinction between fixed and variable costs in Germany.

Keys & van der Merwe (1999) found that German managerial accounting has a different approach in respect to cost drivers, where resource cost drivers are preferred over activity based ones. Assignment of

costs was found to be more accurate, and overhead cost control more detailed. It is remarkable that this paper clearly addressed the dual-cycle system of German accounting, with one cycle for financial, the other for managerial accounting (ibid.).

Sharman (2003) gives the key to understanding German accounting from the American viewpoint: There is a clear distinction between management accounting and financial accounting, they are commonly understood as different “sciences”, which means that each has a different career-development path. Other findings in this paper are the disciplined design and methodology used in GPK, the key role of costs centers, and the integration of GPK into the design of German software applications. Sharman & Vikas (2004) further analyze German cost-accounting and compare it to more recent trends, like activity-based costing (ABC), highlighting that GPK is strongly standardized, its methodology continuously evolved, and it is taught at universities to every business student, which enabled GPK to sustain for over 70 years now, while ABC, strongly marketed by consultants, but methodologically developed in an undisciplined way, resulted in disappointment and, for most implementations, abandonment.

Cheney (2005) point to the complex allocation structure of German cost accounting: Where a typical US company might have one overhead measure per department, a GPK structure typically involves a half dozen or more measures per resource cost center. Krumweide and Suessmair (2007) found that German companies emphasize management accounting more, and U.S. companies place their accounting emphasis on financial reporting. In addition, more German companies than US companies are satisfied with their costing systems. A follow-up paper reveals that the degree of satisfaction with the GPK system is higher when it is used with other complementary costing practices, such as benchmarking, transfer pricing, ABC, and target costing (Krumweide and Suessmair 2008).

Combining ABC with GPK is the emphasis of a paper by Friedl, Küpper & Pedell (2005), who also underline that GPK is a system of variable costing (an apparently important fact often ignored by other authors), meaning that fixed costs are not allocated to products at all, although GPK can be designed to allow multi-level allocations of fixed costs for certain purposes. The practical relevance of accurate splitting into fixed and variable costs in German-speaking countries is affirmed by an empirical study (Friedl, Hammer, Pedell & Küpper 2009).

Since about 2000, a new term is increasingly used in cost management literature. Resource consumption accounting (RCA) is combining German cost management with activity-based costing and focusing on resources rather than cost objects (Clinton & Keys 2002). The three pillars of RCA are (i) resource focus (including recognition of reciprocal resources and usage of theoretical or practical volume so that idle or excess capacity becomes visible and is not charged to products or other cost objects), (ii) using a quantifiable output measurement for each resource pool (instead of allocating dollar values), and (iii) recognition that all costs are either fixed or proportional in terms of resource consumption, and that the nature of proportional costs may change in certain situations (ibid.). Clinton (2004) found that RCA produces more accurate results and provides more detailed management accounting information than the traditional methods. According to (Bhatt 2012), RCA is based on 14 principles, among them (i) causal relationship between support functions and the objects which consume their services, which means to exclude such fixed costs which are not traceable on the basis of causality, (ii) depreciating assets on replacement value, and (ii) relating fixed cost with installed (i.e. theoretical) capacity instead of actual output quantity. There are recent examples of the usability of RCA in various industries like airline (Van Der Merwe & Keys 2002) or glass (Okutmus 2015).

Portz and Lere (2010) also contrast the differences between German and US management accounting. They go beyond the more organizational and methodical aspects of the cost accounting design and recognize the cultural dimension as the main driver of the differences. Like Harrison & McKinnon (1999), they base on Hofstede’s (1980) model, and above all refer to the uncertainty avoidance dimension. Although their paper focuses on a technical detail (the structure of the cost centers), it has encouraged us to consider the dissimilarities of the overall accounting philosophy from a cultural point of view.

(Messner et al 2016) point out that within German-speaking countries, the notion of ‘*Controlling*’ is commonly used to designate the organizational phenomenon that an international audience would

probably describe as management accounting. Referring to Kieser (2003), the authors state that *Controlling* was a discipline whose members seem to be unremittingly occupied with producing and retaining their identity (Messner et al 2016). They criticize three particular characteristics: the identity discourse, the decoupling from the international literature, and the relative lack of empirical studies, and found three factors of influence: the institutional structure of academia in German-speaking countries, the long-lasting fragmentation within the *Controlling* community, and the particular relationship of *Controlling* research to practice (ibid.).

Major Differences between U.S. and German Accounting

Surprisingly underappreciated by the relevant literature (with remarkable exceptions like Brandau et al 2017), the most striking difference in German accounting systems compared to those in the US is the use of a dual-cycle accounting system. One cycle is used for financial accounting, the second one for managerial accounting. The use of two separated ledgers (in German usually denoted as accounting cycles as the term ledger is only used in financial accounting) based on different databases, was suggested by Eugen Schmalenbach (1899). The cycles may work with different figures.

A typical feature of the managerial cycle is the additional use of imputed costs. For example, depreciations in the management accounting cycle might be calculated differently from the financial accounting cycle (i.e. with different useful life assumptions or with different depreciation methods). Using adjusted figures helped to overcome the fallacy that in financial accounting some data reflected the tax law requirements rather than the reality of operations, which should be the basis for management decisions. However, the last major revision of accounting standards in Germany 2009 reduced the relevance of financial accounting for tax accounting significantly. In the US, an integrated accounting system with only one cycle is standard, and therefore the same figures are used for financial and for management information.

The separation allows accountants in German-speaking countries to keep the financial cycle very simple to handle. Monthly closes are fast because financial accounting does not need to wait for information on indirect cost allocation to cost objects. There is no transfer from work in progress (WIP) to finished goods (FG), or from finished goods to cost of goods sold (COGS); those accounts are debited or credited at times that are different from the times when the postings in US accounting would be made, usually as end-of-year entries. This simplified system is called *Gesamtkostenverfahren* in German and could be best described as period costing: All costs (including manufacturing costs) are considered as period costs and are dumped into financial accounting without any attempt to allocate them to cost objects. Consequently, there is no accurate COGS information in financial accounting. Of course, this leads to an error because of the difference between manufacturing costs and costs of goods sold. This error is corrected by a simple year-end adjustment (inventory change of finished goods and WIP), based on managerial accounting estimation (from the other cycle).

Certainly, it is not sufficient for management decisions to have no COGS information on product and/or customer level. US firms solve this problem by using the cost-of-sales method (in German referred to as *Umsatzkostenverfahren*) in their accounting, where all indirect costs have to be allocated to cost objects, and an accurate cost measurement of WIP, FG, and COGS has to be ensured. To enable this, the allocation structure has to be kept simple to avoid intolerable delays in the closing process. Sloppy procedures in manufacturing supervision (for example, missing to report the completion of a manufacturing order, which can easily happen when everybody is busy to set up the next order) inevitably lead to wrong financial information. To avoid this, compliance with work preparation and production monitoring practices has to be strictly enforced.

German cost accountants need COGS information for tasks like segment reporting, just like their American colleagues. That's what the second cycle is good for. While the first cycle is optimized for financial accounting needs (giving a true and fair view of the financial situation without product or customer details, and tax reporting purposes) and completely ignores the needs of management reporting,

the second one is optimized for just that purpose. It is usually very sophisticated, uses many cost centers with complex allocations instead of just a few cost pools. German management accountants can take the liberty to design complex structures because it has no influence on the fast close of the first cycle. The separation of the second cycle also allows having even more detailed information. Usually, product costs are calculated on multiple levels, on a marginal basis as well as by full manufacturing costs. In other words, managers can simulate both variable and absorption costing for the respective purposes, while the only possible method in the US is absorption costing unless the American accountant also opens another cycle for variable costing.

Using two separate cycles for accounting might lead to redundant work. To avoid this, a close integration between both cycles, in particular, a single point of data entry is aspired (Keys & van der Merwe 1999). In fact, pursuing this goal was one of the main reasons for the sophisticated design of German ERP systems like Plaut's semi-standardized individual software solutions of the 1970s and 1980s, which were based on the theoretical conception laid out in Plaut's (et al 1968) book, or later SAP's R/2, R/3, and ERP systems.

Table 1 shows the major characteristics of German and US accounting systems

Table 1. Comparison of the characteristics of German and US accounting systems

German accounting	US accounting
Dual-cycle accounting system One cycle for financial accounting, the other for managerial accounting	Integrated accounting system Financial and managerial accounting use the same cycle
Financial Accounting: Period costing (all costs including manufacturing costs are considered as period costs, corrected by a simple year-end adjustment) Managerial accounting: Cost-of-sales method	Cost-of-sales method (manufacturing costs are inventoried).
Second cycle often very sophisticated (many cost centers, complex allocations), no influence on fast close of first cycle	Must be kept simple. Tradeoff between financial accounting needs (fast close) and managerial accounting needs (segment reporting, margin information).
Second cycle often uses variable costing. Good for decision making.	Only possible valuation method is absorption costing. This can lead to unfavorable decisions (e.g. incentive for buildup of inventory)

Major Roots of Differences in Accounting Systems

It is apparent that academic literature on national differences in accounting is concentrating on methodological and organizational as well as on cross-cultural reasons, but ignoring the deeper economic and legal causes of the dissimilarities. In respect to managerial accounting, the comparison of US models with the German GPK system is focusing on cost centers and allocation practices, but not on the core of the differences like the dual-cycle system.

Root 1: The legal system (Common law versus Civil law)

University of Ottawa's Juriglobe project distinguishes five categories of legal systems; Civil law, Common law, Customary law, Muslim law and Mixed law systems, the latter referring not to a single system but to a combination of systems (Juriglobe project).

Common law systems originate in Medieval England and propagated to the colonies of the British Empire. In their purest forms, they can be found in the United Kingdom (except Scotland), Ireland, Australia, New Zealand, Canada (federal law and all provinces except Quebec), and the United States (federal law and all states except Louisiana). In many other political entities that succeeded from former British colonies, mixed systems (Common law and Civil law or Common Law and Muslim law) can be found. Black's Law Dictionary (Garner 2014, p. 334) defines Common law as "The body of law derived from judicial decisions, rather than from statutes or constitutions" and describes "Caselaw" as synonymous. It is based on prior court decisions, which are considered to be law just like the statutes.

Civil law systems draw their inspiration largely from the Roman law heritage and, by giving precedence to written law, have resolutely opted for a systematic codification of their general law (Juriglobe project). Civil law can be found in Continental Europe, in Turkey, in the successor states of the former Soviet Union, in Latin America, Quebec, Louisiana, Puerto Rico, and in some nations in South East Asia and Africa (ibid.). Civil law traditions can be distinguished into various subgroups, but the main principles are the same: In a Civil law jurisdiction, judges are not allowed to act when there is no statute, and precedent has no weight. On the other hand, judges may interpret the statute, and scholarly literature has more weight than under Common law.

The legal system has a great impact on business, for example on the design of contracts. Contracts under common law tend to be long since all eventualities must be provided for. From our own experience, we can report from a contract that we have signed with an American publisher to provide our students with better prices for certain textbooks. The contract was 19 pages long, single spaced, font size 9, and caused some headache for the university's legal advisor. The same contract if concluded under Austrian law, would have been only a short paragraph, because most details did not have to be considered as they are regulated under statutory law and have to be negotiated only in case of exceptional agreements. Contracts under civil law tend to be compact and focused on the important things.

Another influence of the legal system on business is the distribution of roles in defining the Generally Accepted Accounting Principles (GAAP). The logic of a Common law system is that in a dispute between two parties (e.g. a firm and a group of debt holders) the court will decide based on precedent, in particular on extracting principles of past cases as applicable to the dispute. It is the best interest of all firms to mitigate the risk of litigation, so there is a body needed who defines the GAAP. As this body has to cover all possible circumstances, it should include the knowledge of experts in various industries, public accounting professionals, and experts from academia. In the US, the Financial Accounting Standards Board (FASB), an independent, private-sector, not-for-profit organization based in Norwalk, Connecticut, establishes financial accounting and reporting standards for public and private companies and not-for-profit organizations (self-description on the FASB website). This is a typical configuration for setting standards under Common law jurisdiction. While the U.S. Securities and Exchange Commission had the right to set these standards, it has waived this authority to the FASB (SEC policy statement 33-8221). The rationale behind this arrangement is to give the authority to an organization that is highly trusted by all parties rather than politicians. Consequently, US-GAAP is reflecting the requirement of a true and fair view of the financial situation of a firm, and this hugely reduces the need for adjustments in managerial accounting, resulting in a single-cycle philosophy.

Under Civil law jurisdiction, a court can only decide based on statutory law. Therefore, the GAAP have to be provided by legislation, and the law (*Handelsgesetzbuch* or HGB in Germany, *Unternehmensgesetzbuch* or UGB in Austria) is very sophisticated on that and frequently modified to meet new challenges (e.g. triggered by cases of accounting fraud). Accounting professionals and industry lobbyists are involved in the process of legislation, but it is not surprising that the law reflects the opinion of the lawmakers and the requirements of tax collection to a greater extent than the need for a true and fair

view. Creditor protection lobbies are more influential than industry lobbies, and so the principle of prudence (conservatism) is dominating all other principles in German-speaking countries. Consequently, German and Austrian firms were willing to introduce a separate accounting cycle (which better reflects the reality than the financial accounting cycle) to support management decisions.

Root 2: Preferences in capital procurement (equity versus debt)

It is obvious that the equity/liability ratio depends on the companies' mindset on fundraising. Firms operating in capital market oriented economies (like the US or the UK) have a lower level of leverage than firms operating in bank financing oriented economies (like Continental European economies with the exception of the Netherlands). Rajan & Zingales (1995) calculated the average equity ratios of firms in the G7 countries, finding that it is higher in the UK (42.2 %), Canada (39.7 %), and the USA (34.1 %) than in Germany (28.0 %), France (31.2 %) or Italy (32.6 %). Antoniou, Guney & Paudyal (2008) connect the preferred financing orientation – capital market or bank – to the legal system – Common law versus Civil law. Depending on the legal system, economies are characterized by different financial structures, accounting systems, tax provisions, corporate governance practices, and insolvency codes, all factors thought to be relevant for corporate capital structure decisions (*ibid.*).

Brandau et al (2017), who analyze German accounting history from a sociological viewpoint, argue that the endorsement of the dual ledger accounting approach arose from the strong reliance on bank financing (an economic pressure) and corresponding “prudent” accounting rules (a coercive pressure) that emerged in the late nineteenth century and persisted through to the late twentieth century, justified and reinforced by academia (a normative pressure).

Where capital is preferably raised from investors, accounting systems are designed to inform investors. Where capital is raised from banks, accounting practices meet banks' needs. In the first case, the superordinated goal is to give a true and fair view, in the second case it is to protect the creditors.

The prudence principle imposes stronger recognition requirements for profits than for losses, which leads to provisions in the balance sheet. Recently, a couple of studies address the question of whether the public wisdom that conservatism is beneficial for creditors should be challenged. Kim & Shang (2016) find that conditional conservatism is associated with a lower likelihood of a firm's future stock price crashes, and that the relation between conservatism and crash risk is more pronounced for firms with higher information asymmetry, thus affirming the notion that conditional conservatism limits managers' incentive and ability to overstate performance and hide bad news from investors (*ibid.*).

However, a quantitative study (Goh, Lim, Lobo, & Tong 2017) found that conservatism reduces information asymmetry more between firms and shareholders than between firms and debtholders. This might challenge our thesis of the importance of equity versus debt orientation for the design of accounting systems. But even if the target is not fully met, the different objectives lead to different practices. The superordinated doctrine of prudence in financial accounting encourages the creation of a second cycle for managerial accounting, which reflects a true and fair view. German accounting is characterized by a strict separation of financial and cost accounting, while the US model favors an integrated accounting system.

Root 3: Degree of uncertainty avoidance (low versus high)

The impact of cultural characteristics on the design of accounting systems has been discussed in the academic literature, as mentioned in the previous chapter. In reference to Hofstede's (1980) cross-cultural communication framework (which of course is a model of sophisticated stereotyping, but very useful to support the understanding of cultures), the importance of the uncertainty avoidance index shall be highlighted.

According to Hofstede (2011), Uncertainty Avoidance deals with a society's tolerance for ambiguity. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. Unstructured situations are novel, unknown, surprising, and different from usual. Uncertainty avoiding cultures try to minimize the possibility of such situations by strict behavioral codes, laws, and rules, disapproval of deviant opinions, and a belief in absolute Truth (*ibid.*).

High uncertainty avoidance cultures like Germany or Austria have a strong need for rules and regulations, thus favoring legal regulation of accounting. Low uncertainty avoidance cultures like the USA have a greater readiness to take risks and less emotional resistance to change. These countries tend to have strong independent accounting professions that ensure a firm's compliance with rules rather than governmental regulation.

Root 4: Fundamental management thinking (marketing-corporate versus production-entrepreneurial, and mass production versus sophisticated mass customizing)

Differences in management thinking have a huge influence on the design of accounting systems. While elsewhere the service sector has surpassed manufacturing, Germany's economy is still dominated by manufacturing industries and manufacturing related services, and this is true also for Austria with the exception of the Alpine regions where tourism is the main factor of employment and income.

In Germany, the American business-marketing-corporate-organizational orientation is less in evidence, and the dominant orientation is (still) technical-production-entrepreneurial-pragmatic (Lawrence 2017, Preface). What people believe to be true is an important determinant of action and outcomes, and German managers believe in *Technik* (ibid.). German management is still specialist rather than generalist, has comparatively low inter-company and inter-industry mobility, an operative focus, benefits from strong training and competence at the lower level enabling larger spans of control and shorter hierarchies (ibid.).

The view on marketing of German managers is considerably different from American managers. German companies typically expect to sell on quality not price. Marketing is seen as being about the different needs of individual customers, rather than a generalized promotion of the company offering (Lawrence 2017, Preface).

These different views on marketing can be illustrated with the preferred forms of mass customization (MC). Gilmore & Pine (1997, as summarized by Modrak 2017) categorize MC into adaptive, cosmetic, transparent, and collaborative customization. Adaptive approach and cosmetic approach mean that products and services are standardized but customers can opt for a few add-ons (adaptive) or can choose between different sizes or colors (cosmetic). The transparent form is driven by modularity, which means that the customer can assemble the product or service as a combination of standardized items, and the collaborative approach means that the producer conducts a dialogue with the individual customer to even specify undefined features or properties of the product (ibid.).

A more recent classification of mass customization is given by Kull (2015, p. 15) who distinguishes between configuration oriented MC, where customers can configure selected parts of products individually to their own solution, and parametrized oriented which allows customers to change the visual aspects of the product. BMW's literally unlimited variations of their cars are a good example of the configuration approach, while a Smartphone, which may come in only one configuration (except different colors) but can be individualized by customers with the download of apps, can be considered as an example of the parameterized approach.

In their philosophy of seeing marketing as being about the different needs of individual customers, managers in German-speaking countries tend to follow the transparent or the collaborative customization approach, while American managers, in their approach of seeing marketing as a generalized promotion of the company offering, would prefer adaptive or cosmetic forms of mass customization.

German approaches present enormous difficulties in the design and operation of assembly systems, and empirical and simulation studies have shown that increased product variety has a significant negative impact on the performance of assembly processes (Matt & Rauch 2017). However, German marketing thinking believes that these complexities have to be accepted to satisfy the customer, and the difficulties must be resolved by the engineers. Norbert Reithofer (2005), former CEO and now head of the supervisory board of BMW, unveiled that the theoretically possible number of combinations for a BMW 5 series model is 10 high 17. In practice, this means that no vehicle configuration is built twice a day in any of the BMW plants. Certainly, the German customer does not only want an individual car, but also

wants it quickly, and often changes his or her mind a few days after ordering. BMW offers a delivery time for the customized car of 12 days, and can make changes for certain configurations even a few days after placing the order (usually until 4 days before production starts). The basis for the BMW production system (called KOVP, *Kundenorientierter Vertriebs- und Produktionsprozess*, customer oriented sales and manufacturing process) is the late allocation of the customer order only at the beginning of the assembly - that is, after the welding of the body and the painting. After scheduling the customer order in manufacturing, the already painted bodies are delivered 'just in time' to the assembly line from a high-rack warehouse (ibid.).

US automakers allow the customer to configure their cars, too, but with a significantly lower number of options. The purest form of American marketing thinking is represented by Tesla. Tesla identified a hidden need that is prevalent in a large group of customers – driving a high-performance sports-car and still feeling as an ecologist. To satisfy this need, only two or three models with choices limited to very few features like the color are sufficient.

This marketing approach perfectly corresponds to the needs of American customers, who prefer a lower quantity of choices. In a quantitative study, Khan & Haasis (2016) found that the huge number of options that German premium car producers offer to their US customers (much less than in Germany, but still on average 1.7 million options for any BMW model and 430,000 options for any Mercedes-Benz model) has even a negative impact on the producer-buyer relationship in the USA.

In a mass production environment with limited customizing, simple forms of management accounting are sufficient. In a Chinese plant that produces a single model of iPhone, product costs can be calculated by dividing all costs by quantity of units produced. In a mass customizing environment, detailed planning and sophisticated cost allocation are needed to compute realistic product costs. German ERP solutions can even serve as examples for mass customization: The cost accounting module in SAP's software was designed to fulfill all possible needs of management accountants in all possible industries. Therefore, the number of customizing parameters is immense, and the hugest investment in every SAP implementation project used to be the cost of the consultants who adjust the cost accounting module's parameters to the customer's business processes, rather than the license fee for the software. To reduce the time and cost of the implementation, SAP has moved to pre-parameterizing the software for various industries.

Conclusion and Reflection: What Triggers the Convergence of Accounting Systems?

Recently, a convergence between accounting systems can be observed in business practice. We identify three major triggers for this process of approximation: (1) the development of ERP systems, (2) regulatory requirements, and (3) changes in management thinking.

Trigger 1: Development of ERP systems

Like mentioned in the last chapter, SAP's managerial accounting module (in German called *Controlling*) has been designed to meet all needs of German accountants in all manufacturing, service-sector, and commercial industries. The authors of this paper have 25 years of experience in teaching and researching German managerial accounting, and one of us has professionally implemented SAP systems for over eight years, and found that all features of the GPK system are supported by SAP, and that SAP's clients can customize the system to all designs of US or German managerial accounting they want. SAP is the biggest software corporation in Europe, and, according to market share studies (e.g. Pang et al 2013, Pang 2016), world market leader in ERP software with 335,000 customers in 190 countries in the year 2015. Because of this status as the industry leader, SAP is exporting German cost accounting philosophy to the world. A qualitative case study conducted in an Austrian manufacturing company of the wood industry (Heinzelmann 2017) demonstrates how the German managerial accounting logic gets diffused throughout the organization to all local entities by the means of the SAP ERP system. The study shows that the

software can foster the diffusion of the GPK system, which is inherently linked to the SAP system, to other countries with different managerial accounting traditions.

Our conclusion is that because of the opportunity of a second cycle provided by SAP, dual-cycle systems may become considerable for American companies for certain purposes. One of the benefits could be enabling variable costing for better management decisions (e.g. to avoid incentives for inventory buildup). On the other hand, because of the high degree of integration of ERP systems like SAP, sophisticated cost allocations may become possible even in a single-cycle accounting system, leading to an incentive for corporations in German-speaking countries to move towards single-cycle systems.

Trigger 2: Regulatory requirements

International Financial Reporting Standards (IFRS), issued by the International Accounting Standards Board (IASB) follow the American model of standard setting. The IASB is, just like the FASB, an independent, private-sector, not-for-profit organization, responsible for developing a single set of high-quality, global accounting standards. According to the board's mission statement (IFRS website), it strives to develop standards that bring transparency, accountability, and efficiency to financial markets around the world. The members of the board are appointed based on qualification and are governed and overseen by Trustees from around the world. Around 120 countries have obliged at least their internationally operating corporations to follow the IFRS standards. Pursuing to the goal of strengthening transparency, accountability, and efficiency to financial markets requires standards that reflect the true and fair view of the financial situation of a firm. Although a recent study shows that the convergence of accounting standards does not always lead to the convergence of accounting practices (Olesen & Cheng 2017), our conclusion is that IFRS might reduce the necessity of a second accounting cycle for firms in German-speaking countries.

Like mentioned before, using adjusted figures in German managerial accounting's second cycle helps to overcome the fallacy that in financial accounting some data reflect the tax law requirements rather than the reality of operations, which should be the basis for management decisions. Until 2009, German income tax law (§5 *Einkommensteuergesetz*) made the relevance of financial accounting information (e.g. the length of operating lives) for tax declarations a binding principle (*Maßgeblichkeitsprinzip*) and likewise allowed for the reversed relevance (*umgekehrtes Maßgeblichkeitsprinzip*, § 254 German *Handesgesetzbuch*) of tax accounting information for financial accounting (Kollmann & Zolles 2016). This legal concept helped to direct financial accounting information mainly to tax authorities and therefore created the need for an internal managerial accounting system providing "real" information". The idea to link financial accounting and tax accounting goes back as far as 1874 (§ 22 income tax law of the Kingdom of Saxony) and was generally introduced to the German income tax law in 1934 (*ibid.*). However, the last major revision of accounting standards (*Bilanzrechtsmodernisierungsgesetz* 2009) eliminated the reversed relevance of tax accounting for financial accounting and therefore reduced the relevance of financial accounting for tax accounting significantly.

Trigger 3: Changes in management thinking

Managers of internationally operating businesses realize that different marketing philosophies are necessary for different markets. Americans are less interested in overwhelmingly numerous configurations of a vehicle than Germans, and Germans might be less impressed by a sublime selling proposition than Americans if the product does not meet their appreciation for sophistication and perfection. This might change management thinking, and we assume that it will be rather the managers in German-speaking countries who will adjust their way of thinking. A recent empirical study (Kajuter & Schröder 2017) investigates the design of cost-accounting systems in German subsidiaries of anglophone multinational enterprises revealing that anglophone cost-accounting traditions prevail in two-thirds of

anglophone subsidiaries, suggesting that anglophone multinationals standardize their cost accounting systems globally using their home country cost accounting traditions. The study also shows that both management accountants and managers in German subsidiaries of anglophone enterprises assess their cost-accounting system worse when it is shaped by anglophone traditions (ibid.).

Manager's education is an important determinant for their mindset. A distinctive feature of middle and upper level managers' education in German-speaking countries is that a significant minority of managers do combine the humbler qualifications of the dual vocational education system with higher university-level qualifications (Lawrence 2017, p. 67), usually with a primacy of three subjects of study – law, economics, and engineering (ibid.). Being members of university faculties and study program accreditation bodies for many years now we are at the frontline of change in the university sector in Austria and Germany, and we recognize that there is a significant movement in management education, as German-speaking countries are increasingly taking on Anglosaxon style management education by offering management, finance, and marketing oriented MBA programs. We conclude that this shift in academic educational style will catalyze the alignment in management thinking.

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