

Economic Specialisation in Metropolitan Areas Revisited: Transactional Occupations in Hamburg, Germany

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Summary. To characterise economic activities in which metropolitan areas specialise, recourse is commonly taken to categories like producer or (knowledge-intensive) business services, derived from efforts to differentiate the notoriously heterogeneous service sector. An alternative approach to categorising economic activities is explored in this paper, building on the notion of transactional activities theoretically founded in ‘new institutional economics’. To test this approach, which surpasses the manufacturing–services dichotomy, the 328 occupations of the German classification system are reclassified into three main groups (transaction, production/transformation and R&D occupations) and sub-groups thereof. Comparing the occupational structure of Hamburg and Germany reveals that production/transformation activities still predominate nationwide, whereas Hamburg primarily specialises in transaction activities. Specialisation is particularly evident in certain transactional sub-groups, like advertising or agents/brokers/auctioneers. For other sub-groups, like publishing or wholesale, habitually undervalued in urban research, specialisation is also significant, while decisive R&D occupations are less important. In sum, a new and productive way to represent and analyse the complexities of the spatial division of labour opens up.

1. Introduction

One of the main differences between metropolitan and non-metropolitan regional economies in contemporary societies is conventionally seen in their diverging economic structures, exemplified by the differing composition of the labour force in these territories. While metropolitan areas are portrayed as economic centres where specific service occupations increasingly gain importance in relation to production activities, the remaining national territories are seen, conversely, as still comparatively strongly

shaped by manufacturing and other production activities. With large concentrations of specific services, in absolute and relative terms, metropolitan areas then epitomise the most advanced places of their national economies that develop (in older interpretations) towards service or information societies or (in recent reading) towards knowledge-based societies.

Different characterisations have been developed for these specific services in the literature on services and urban development:

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(advanced) producer services, business or professional services (see Daniels and Moulaert, 1991; Illeris, 1996). From the sectoral perspective, these services are provided by specialised firms of the tertiary or quaternary sector and comprise activities like management consulting, accounting, finance and legal advice. Often research and development, as well as core segments of information-technology-related industries and high-technology manufacturing are added to these lists of supposedly typical metropolitan activities. If functional aspects of spatial development are taken into account, like in the debate on world or global cities as reviewed, for example, by Beaverstock *et al.* (1999), higher-level managerial functions such as corporate planning or strategic decision-making are also included. In studies of innovation processes, which have recently shifted their attention towards the service sector, it is the group of knowledge-intensive business services (KIBS) which is regarded as decisive for regional economic prosperity. And it is mainly the sub-group of technology-based knowledge-intensive business services (TKIBS) that is regarded as propelling innovation and growth (Bilderbeek *et al.*, 1998; Miles, 2000).

Alongside these debates about spatial development, structural shifts in the composition of the labour force and technological innovation, the long widely accepted division between the two basic sectors—services and manufacturing—has come under renewed attack. Daniels (2001, p. 13) argues that the present regime of technological innovation, especially in information technologies, increasing product diversity and customisation results in a “breakdown of the distinction between the manufactured and service component of a product”. Consequently, the separation into a service and a manufacturing sector is unsustainable and “economic geographers have to reconsider the boundaries that they place around economic activities”. While Daniels (2001) suggests completely rethinking the process of production, circulation and consumption to that end, a different way of reconceptualising economic

activities can be developed by applying an institutionalist perspective to categorise economic activities (Stein, 2002). A large body of literature has emerged around the institutionalist approach of Coase (1937), Commons (1934) and Williamson (1981, 1985) and this view is at the same time highly contested (see Sayer and Walker, 1992; Pitelis, 1998) and widely applied (see Furubotn and Richter, 1997). New institutional economics is aimed above all at determining the efficiency of specific organisational arrangements under different circumstances. The size of transaction costs is used as the main indicator for optimal organisational solutions. These costs can be related to certain typical transaction activities, which are necessary to plan, organise, execute and control exchange in any organisational setting, be it a market, a firm or a network. Transactional activities are in many cases performed by specialised workers or firms, forming a distinct, large and in the long run probably growing segment of national economies (Wallis and North, 1986; Löchel, 1995).

The notion of transactions has also been used by Gottmann (1982, 1983), and authors writing from his viewpoint, assuming the progressive transformation of urban areas towards ‘transactional cities’. However, since that perspective is not developed from the theoretical foundations of institutionalist thinking, it has led to categorisations of economic activities and predictions about urban development, which are only consistent in part with the approach advocated here. Whereas in the literature following Gottmann’s analyses, the focus is on ‘white-collar’ or ‘quaternary’ services that deal with all kinds of information or are part of technologically advanced sectors, the approach discussed here starts at a different point of departure.

The issue is what kind of organisational structures exist to manage transactions between economic agents, where the term transactions is taken literally to denote any kind of transaction, be it within a firm, in a market or other forms of organisation. The

recourse to the institutionalist view allows a rigorous definition of transaction activities. And this does not incorporate a statement about the physical appearance (tangible or intangible) of the objects dealt with, the technological requirements of a production process (craft work or high-tech) or the qualification of employees. Although, of course, the latter factor in particular plays an important role in explaining spatial differentiation. An initial theoretical outline of this approach has been presented elsewhere, illustrated with significant examples of specialised transactional occupations, professions and firms from present-day economic reality and discussed in relation to the categories of the NACE nomenclature, in particular to the sub-groups of business and professional services (Stein, 2002). It showed a partial overlap of transactional activities with these categories, but also significant discrepancies leading to a view on spatial phenomena differing from most conventional accounts. This argument was developed from a theoretical standpoint and confronted with an existing classification of occupations at the aggregate level, the European NACE systematic, designed to harmonise the statistical classification system of EU member-states.

In this paper, transactional activities will be identified on the basis of a detailed, national classification of occupations. The examination is an initial empirical test to consider whether a 'real' occupational structure, resulting from the technical and social division of labour in an economy and represented through a statistical framework, can be described consistently with an approach derived from the institutionalist view and to compare the ensuing metropolitan and national occupational structures. Deviations between this kind of approach and conventional three-sector analyses, including the more refined versions taking business services and variants thereof into account, will become evident.

The following second part of the paper introduces the hypotheses to be discussed, summarising the basic assertions and consequences of a reclassification of economic

activities. In the third part, the rationale for choosing Hamburg for a case study is given and the city's economic role and position in urban and regional hierarchies are outlined. The fourth part describes the indicators applied and the advantages and drawbacks of the data-set used. The fifth part contains a review of the theoretical background of the (re)classification and its application to the occupational categories of the official German classification system. In the sixth part, the reconstructed classification of occupations is used to analyse the specialisations of Hamburg's employees in relation to Germany as a whole. Finally, results are summarised and some core questions for future research delineated.

2. Basic Hypotheses

There are four basic hypotheses to be examined by confronting theoretical assertions with an existing nomenclature of professions and statistical data for a city and a nation.

First, a meaningful classification of occupations can be derived from the descriptive categories for activities obtained by applying an institutionalist perspective. It should hence be possible to qualify most occupations in a conventional statistical classification scheme as being either transactional or not. The conventional (German) classification scheme has been developed using different criteria, so that naturally there will be limitations to a reclassification. Also, every classification scheme only partly reflects the real world (especially with respect to modern occupations) and the same applies to a reclassification.

Secondly, the new classification of occupations should reflect the fact that cities specialise in transactional activities, while in national territories non-transactional activities have greater weight. This will be explored for the city of Hamburg in comparison with the whole of Germany. Of course, the structure of economic activities in a metropolitan region develops in a complex and dynamic interplay of many factors: geographical, economical, historical, cultural

and political, lying beyond the scope of this paper. What is presented will consequently only be a partial analysis.

Thirdly, the reclassification of economic activities into a transactional and a production/transformation group (and subgroups of those) should reveal that the pure transactional activities determine the specialisation of large cities. In contrast, other occupations usually considered as advanced producer services or knowledge-intensive business services like R&D or (highly specialised) technical professions are predicted to be relatively *less* concentrated than specialised transactional activities.¹

Fourthly, conversely, there are many specialised transactional activities, usually disregarded or only selectively treated in urban analysis, since they do not easily fit into the categories developed along the 'producer services/knowledge-intensity' scheme, that are probably also *highly* concentrated in urban areas. Wholesale is a good case in point, being a typical transactional activity, for which there is some, admittedly incidental, evidence indicating that it is not an irrelevant sector as it is often treated. Thus recent research on innovation in services for the UK (Miles, 2001) shows that, when 20 service sectors are compared on the basis of the total amount spent on technological innovation in relation to turnover, wholesale is ranked in the relatively high position 7. In addition, research about fast-growing young firms ('gazelles') in the Netherlands (Stam, 1999) reveals that: it is the KIBS sector and wholesale that show the strongest employment rate growth in the period 1987–94; and, the share of 'gazelles' stemming from wholesale is second after the clearly leading KIBS sector and thus still a little larger than the share of 'gazelles' from 'modern manufacturing'. Other such commonly undervalued typical transactional activities are—for example, publishing, auctioneering and the work of agents in culture industries.

3. Hamburg as an Example

These four hypotheses are to be confronted

with empirical evidence and the question arises which (German) city might be suitable for that purpose. In Germany's relatively decentralised urban system, no dominating or 'typical' metropolis exists that could clearly be identified as particularly appropriate for the intended exercise. Measured by the number of inhabitants, an indicator that can be expected to be correlated to the degree of concentration of specialised transactional activities, Berlin (3.4 million population) is by far the largest German city, second is Hamburg (1.7 million) and third Munich (1.2 million). But, although Berlin is the most populous city and capital of Germany, it is far from being a 'normal' post-Fordist city (Krätke and Borst, 2000) or high-ranking world city (see Beaverstock *et al.*, 1999). Therefore, Hamburg was chosen for the following case study.²

To place Hamburg in relation to other urban regions, a brief profile of the city is drawn with some basic geographical and economic data.³ The city's area comprises 755 square km and population density amounts to 2254 inhabitants per square km (Figure 1). In the greater metropolitan region of Hamburg, embracing the city plus six adjacent counties, total employment amounts to 1.074 million persons.⁴ More than 70 per cent of these employees work within the boundaries of the city, showing that the city is still, in spite of suburbanisation, the economic core of the region.

In interregional rankings by per capita income (GDP per head measured in PPS), Hamburg is persistently among the few exceptionally rich regions in the European Union. In 1999, Hamburg's GDP was 83 percentage points higher than the EU average; only Inner London, Bruxelles and Luxembourg reached higher values.⁵

Hamburg's economic role is primarily associated with its functions in international trade. The container port is the second-largest in Europe and the ninth-largest worldwide. But high-tech, modern manufacturing and culture industries increasingly shape the city's economic structure. In aircraft manufacturing Hamburg is now internationally an

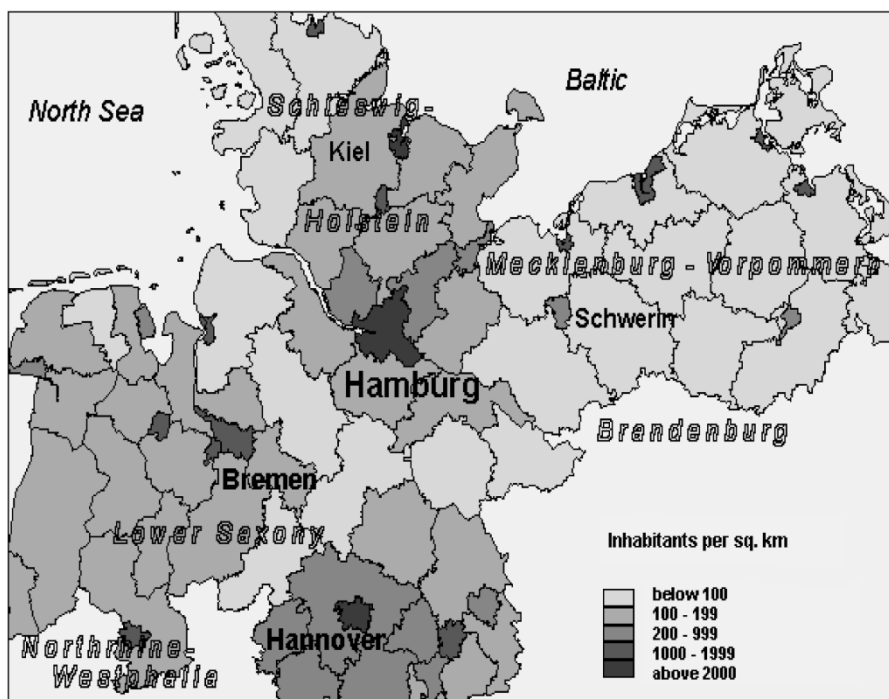


Figure 1. Population density in Hamburg and the surrounding Northern German federal states, 1998 (by county). *Note:* 1 cm represents approximately 40 km.

important location with about 14 000 employees. Further important industries, as measured by employment, are mechanical engineering, computer/electrical and optical equipment industries as well as publishing and printing, employing together another 37 000 workers. Some smaller industries, including chemicals, mineral oil and rubber and plastic production, employ 17 000 workers in total.

In the producer service sector, Hamburg is above all structured by trade-related functions, insurance and financial activities and, in global hierarchies of cities, it is regarded as a world city, albeit on the lowest possible (gamma) level (see Beaverstock *et al.*, 1999). Furthermore, it is a centre for the media and advertising industry in Germany. The ‘new economy’ is strongly represented, too—for instance, with content production for 6 of the 10 most frequently visited German websites.

Total employment change from 1976 to 1996 in Hamburg was, in comparison with

other German agglomerations, not as strongly positive as in the booming Southern ones, but it was much stronger than in the remaining German agglomerations and is, thus, closest to the German average (see Bade and Niebuhr, 1999).

4. Data-set and Indicators

The following statistical investigation is based on a data-set for 1997, in which all employees with social insurance in Germany are registered at their place of work and classified according to 328 occupations. This data-set covers about 80 per cent of the total labour force (*Erwerbstätige*) and has the advantage of being based on a comprehensive and reasonably detailed sub-division of occupations.⁶ The main disadvantage of this classification is its bias towards manufacturing occupations. Occupations related to the production of non-tangible output are far less differentiated. In addition, since the basis of

this classification was established in the early 1970s, modern occupations—in particular, those related to information and communication technologies—are underrepresented. While these drawbacks limit the use of the presented material to reflect the continuously changing division of labour within the ‘service sector’ and the effects of modern technologies, they do not preclude an assessment of the applicability of the approach in general.

In order to compare Hamburg’s occupational structure with that of Germany, two simple indicators are used. First, the *shares* of employees occupied in transactional and non-transactional occupations (and sub-groups of those) were determined for Germany and Hamburg. The size of the share (absolute concentration) indicates the relative economic importance of these occupations/sub-groups. The potential for income and wealth creation by these activities in the two territories is naturally closely related to the size of these shares, but also dependent on other factors like the qualifications of the employees or supply and demand conditions in the labour market.

Secondly, the *index of localisation* (IoL) was calculated for all groups and sub-groups of occupations, showing how strongly metropolitan and national structures diverge—or, to put it another way, how intensely a certain territory specialises in a certain activity. The index is calculated from the ratio of the share of employment of a main (or sub-) group of occupations in one region (Hamburg) to the share of those activities nationwide. An index of 100 results when both shares are equal. An index smaller than 100 indicates an ‘underrepresentation’ of that group of activities in the city and an index above 100 ‘overrepresentation’, hence relative concentration or specialisation.

5. Classification Procedure: Rationale, Method and Limitations

To categorise each of the 328 occupations and to obtain results that can be read in the context of urban development, a two-tiered

classification procedure was applied. In the first step, the content of transactional work in each occupation was assessed, leading to three main groups of activities: transactional occupations; R&D and academic occupations; and, production and transformation occupations. In the second step, sub-groups within the three main groups of occupations were constructed that can be interpreted in the general context of urban development and the specifics of Hamburg’s economy. Before proceeding with the detailed description of these steps, the theoretical background and criteria for the classification are briefly described.

5.1 Assessing the Transactional Content of Work in an Occupation

At the outset, it had to be judged whether a typical employee in a certain occupation among the 328 listed performs transactional tasks, production/transformation tasks or belongs to the academic group. As a result (Table 1), two (large) main groups of occupations were formed: transactional and production/transformation occupations; together with a (small) main group of R&D and academic occupations.⁷ The latter group was separated for reasons explained below.

Logically, for this type of classification to be meaningful, it has to be assumed that the actual tasks performed by a worker of a certain occupational category coincide on the whole with the tasks suggested by the respective designation. While this naturally must not be true in all cases, the considerable number of different occupations and the high numbers of employees included, in both the nation and the city, probably reproduces by and large a realistic picture of the structural division of labour in these territories and the divergences between them.

How then is the decision made whether an occupation belongs to the transaction or to the non-transaction group? The main criterion for defining an occupation as transactional is whether the typical tasks performed are covered by the definition of transaction activities as used in institutional economics

Table 1. Employment structure of Hamburg and Germany, 1997

Main groups and sub-groups of occupations	Employees (000s)		Share (percentage)		Index of localisation for Hamburg
	Hamburg	Germany	Hamburg	Germany	
<i>Transaction</i>	344.9	9 742.5	47.1	35.7	132
Advertising	4.8	51.4	0.6	0.2	345
Agents/brokers/auctioneers	5.7	107.2	0.8	0.4	196
Computing/calculation/accounting	29.9	591.2	4.1	2.2	189
Publishing	1.3	27.9	0.2	0.1	179
Insurance/banking	38.3	833.6	5.2	3.1	171
Management/organisation/supervision	30.5	708.1	4.2	2.6	160
Consulting/counselling/legal representation	10.5	244.3	1.4	0.9	160
Wholesale/purchasing	26.1	666.8	3.6	2.4	146
Security	11.6	321.0	1.6	1.2	135
Supportive activities (administrative and other)	136.3	4 126.9	18.6	15.1	123
Testing/controlling/bill collecting	14.9	584.8	2.0	2.1	95
Retail	35.0	1 479.3	4.8	5.4	88
<i>Research & development/Academia</i>	28.6	887.5	3.9	3.3	120
Professors	2.7	59.5	0.4	0.2	172
Engineers/chemists/physicists	21.9	699.1	3.0	2.6	117
Other scientists (natural scientists, humanities)	3.9	128.9	0.5	0.5	114
<i>Production/Transformation</i>	276.4	13 342.3	37.7	48.9	77
Cultural production	13.7	343.5	1.9	1.3	148
Cleaning/maintenance	24.9	790.8	3.4	2.9	117
Transport/storage/distribution	51.4	1 810.4	7.0	6.6	106
Personal services	26.6	1 052.9	3.6	3.9	94
Technical	50.7	2 129.2	6.9	7.8	89
Manufacturing	102.8	6 676.4	14.0	24.5	57
Resource-based (agriculture, mining) ^a	6.4	539.2	0.9	2.0	44
<i>Public Sector</i>	79.2	3 155.5	10.8	11.6	93
Government/administration/justice	4.9	150.4	0.7	0.6	120
Social services/education/health	74.3	3 005.1	10.1	11.0	92
Other (occupations not specified, etc.)	3.2	151.7	0.4	0.6	80
Total	732.3	27 279.6	100.0	100.0	—

^a Agricultural and other occupations based on natural resources were all fused into one group and regarded as non-transactional, although transactional professions, of course, exist in these sectors, too. But since Hamburg's and the national occupational structure will be compared it seemed appropriate to separate out activities which are in general performed in rural areas.

Sources: Analysis by Statistical Offices of Hamburg and Germany from *Statistik der Sozialversicherungspflichtig Beschäftigten* for Hamburg and Germany (see also Kräike and Borst, 2000); author's own calculations.

(Stein, 2002). Furubotn and Richter (1997) for example, differentiate between market and hierarchical forms of organisation and enumerate the standard transaction activities being carried out regularly in these forms or in mixed organisational forms. In markets, transaction activities can be typified by the phases of the contractual activity. Pre-contractual transaction activities, like search and inspection, are usually required when contracts between economic agents are in preparation. Normally, bargaining and contracting will then be carried out, followed by the post-contractual activities of execution, control and, often, enforcement of the contract. Typical transactional activities conducted within or for enterprises are tasks like establishing or restructuring an organisation, personnel management, monitoring of business, supervision of employees, dealing with interfirm relationships and decision-making. Whereas the first type of transaction activity is necessary for co-ordinating the actions of (principally) independent economic subjects (persons, firms or other institutions)—i.e. the social division of labour—the second is necessary to co-ordinate the actions of agents within institutions—i.e. the technical division of labour. In contrast, as long as an employee basically works (physically and/or mentally) on a certain object (tangible or not) and it is not transferred to another economic agent inside or outside a firm, he or she performs production tasks. This might be applied in analogous form to activities that transform the condition of a person like the often-cited haircut, a medical treatment or a musical presentation in a concert. In both cases, for production and transformation activities, these basic activities can be separated from transaction activities or tasks that are required to search for, plan, co-ordinate, regulate, bargain about or control economic exchange. This definition of transactional activities (or occupations) is thus *not* related to the physical appearance or tangibility of the objects being exchanged or resulting from a work process. These objects can be a ‘good’ or a ‘service’ in traditional terminology, or a hybrid form. Some examples of how occupa-

tions would be classified from that perspective are the following

- A composer of a song, the writer of a screen book and a (possibly highly qualified) scientist designing a blueprint for the construction of a high-tech product all perform non-transactional occupations.
- And, the actual writing of the original (of a story or a novel) and the final printing of newspapers or books are non-transactional occupations. However, the essential publishing tasks—i.e. decision-making about marketable stories, organising internal production processes, dealing with other suppliers or handling of copyrights, are all elementary transactional tasks; and these tasks are often performed by specialised employees or firms.
- Similarly, the work of a shipping agent or a dispatcher is typically transactional as opposed to the work of truck driver or a port labourer performing non-transactional tasks. Nor is the work of (a possibly highly skilled) technician or engineer transactional, controlling a computerised container terminal or some other highly sophisticated technological production process. These last occupations do not deal chiefly and directly with exchange between human agents.

R&D and academic occupations are presented as a separate group since they usually contain a mix of transactional and non-transactional occupations and because of their generally assumed outstanding significance for regional growth. Keeping R&D occupations separate allows comparisons with pure transactional activities. Adding to this, the classification of R&D occupations into the transaction—non-transaction scheme involves many complicated issues, that cannot be dealt with here at length.⁸ For instance, conducting basic research in natural sciences is definitely not a transactional occupation, but research for innovative consumer products will involve usually a large amount of transactional work—like, for example, market research. Since very valuable knowledge and often immaterial objects and risky deci-

sions are dealt with in R&D, the necessary transactional arrangements (work contracts, internal organisational structures, supplier relationships, etc.) are particularly difficult, which leads to highly complex organisational structures that can hardly be reflected in the occupational categories of a statistical classification system. Thus, R&D and academic occupations were not fused with another group, but aggregated into a separate group positioned between transactional and non-transactional occupations.

5.2 *Reclassifying Categories of the German Classification System of Occupations*

By applying the above criteria, the vast majority of the 328 occupational categories can be judged quite clearly as being either transactional or belonging to the production/transformation group (Appendix, Table A1), although this kind of procedure inevitably involves a subjective judgement to certain extent.⁹

For a number of occupations, however, this procedure does not lead to satisfying results. One reason is that the 328 occupations have been themselves aggregated (in two steps) from more differentiated occupational sub-categories, which sometimes cannot be clearly identified as transactional or not.¹⁰ And in some cases, the label of the occupation is simply too general to be correlated to specific tasks in the sense of the approach advanced here. Problematic cases are the following

- (1) Occupations of the publishing and printing industries were briefly mentioned above and are of particular importance for Hamburg's economy. The occupational category 'publicists' (Code-No. 821) incorporates various occupations such as writers and journalists, but also editors and dramatic advisors (*Dramaturgen*). While the former two occupations regularly perform production tasks, the latter predominantly perform transactional functions. Since it cannot be decided which type of tasks predomi-
- nate on average for employees characterised as publicists, these were fused into the production group which possibly leads to an underestimation of transactional employees in the following statistics.
- (2) 'Data-processing specialists' (774): this category, as well as most of the sub-categories, is too imprecise for the classification at hand and cannot be related straightforwardly to one of the groups of occupations differentiated theoretically. Whether such employees fulfill production or transaction tasks depends on the function of their work; it might contribute to both domains. But since today almost all firms use some form of computerised equipment requiring the work of hardware and software specialists, the share of such work related to (internal or external) transactional tasks is probably larger than the share of jobs related primarily to production (such as writing software for automated manufacturing). Therefore, transactional tasks probably prevail in this case.
- (3) Another problem occurs for occupations that are often performed by self-employed workers or independent entrepreneurs—for instance, craftsmen like 'butchers' (401), 'carpenters' (451) or 'restaurant/hotel workers/owners' (911). In the case of a one-person enterprise, all tasks, transactional and non-transactional ones, logically have to be performed by the same person. But workers grouped into such occupations in the given data-set are dependent employees and it can be assumed that, on the whole, production tasks prevail.
- (4) Some other ambiguities remain, although they appear to be of minor importance for the present undertaking. 'Railway controllers, conductors' (712) embrace a mainly technical type of occupation (directing, steering train movements) and a transaction-related one (controlling travellers, selling tickets). Since it is not known which kind of activities predomi-

nate this category was included in production. A similar problem exists for 'goods examiners and sorters' (521): if their work relates to technical problems, like quality control for products of an automated process, it is a part of production; if it is a direct control of human labour, it is a transactional occupation. The latter was assumed to prevail. An analogous stance can be taken for classifying 'interpreters' (822). If their work is related to economic exchange (for example, interpreting in a bargaining process in international trade), it would be a transactional task supporting exchange. If a novel is translated from one language into another, it would be a form of production, similar to the writing of a book. Probably, in a world of rapidly increasing international exchange, the former functions predominate in general.

In spite of these cases that cannot be classified satisfactorily, the number of occupations that are problematic to categorise remains in total relatively low. For most of the occupations, it is obvious to which main group they belong.

5.3 *Constructing Sub-groups*

Within the three main groups of occupations, sub-groups were constructed (Table 1). This appears indispensable in view of the large number of single occupations and allows an overview and interpretation of the results. Nonetheless, the structuring of the sub-groups is of secondary significance for the present classification centred on the transactional vs non-transactional question. For constructing sub-groups, similar types of occupation were fused, where similarity was broadly defined by the characteristic output and work processes of occupations. The ensuing aggregation of occupations into sub-groups is, in spite of a certain coherence, in no ways imperative.

Some of the resulting sub-groups resemble traditional classifications since sectoral criteria play a role here, which they did not in

the preceding classification step. Nevertheless, especially within the transactional group, definitions of sub-groups diverge from traditional understanding (for example, consulting/counselling/legal representation) and there are sub-groups (such as publishing or wholesale/purchasing) that are classified completely differently from usual. This will become apparent in the next section when the significance of single sub-groups is discussed.

The main group of R&D and academic occupations was divided into sub-groups as well. In this case, the structure of the sub-groups was predetermined largely by the classification system of occupations. The first sub-group contains all professors (871);¹¹ the second, all engineers and chemists, physicists and mathematicians (601–612); and the third all other scientists (881–883) such as those from humanities or natural sciences not included in the previous sub-group. For spatial development, the second sub-group is most decisive, since in all probability these employees carry out the bulk of private R&D.

6. **Statistical Results**

With the theoretical and methodological background laid, a new picture of Hamburg's and Germany's occupational structure and economy can now be drawn, departing manifestly from traditional three-sector analysis as well as from more elaborate versions taking producer or knowledge-intensive business services and the like into account. But first, the economic importance of the main groups of activities defined above will be briefly elucidated.

6.1 *Transactional vs Non-transactional Activities in Metropolitan and National Occupational Structure*

Nationwide, production and transformation activities still clearly dominate the occupational structure (Figure 2). Close to half (48.9 per cent) of all employees belongs to that group, while transaction activities are performed by only a little more than one-

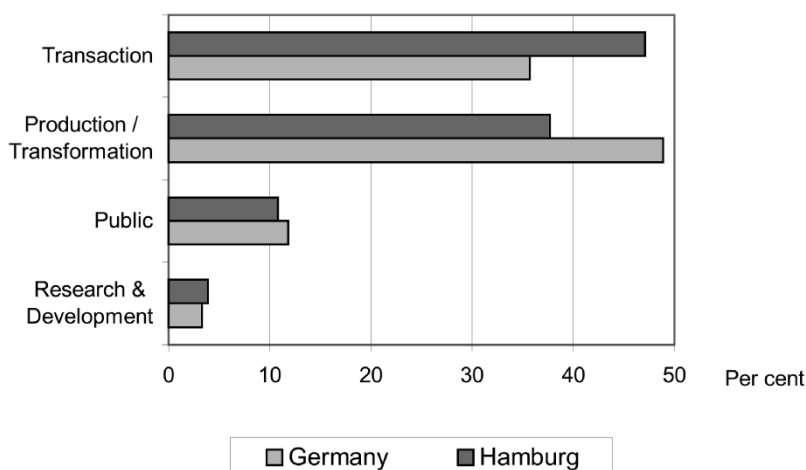


Figure 2. Percentage share of total employment for the main occupational groups in Germany and Hamburg, 1997. *Source:* see Table 1.

third (35.7 per cent). Interestingly, a fairly similar estimate (34.5 per cent) for the share that the transaction sector contributed in 1990 to gross value added in Germany is presented by Löchel (1995). These results obviously conflict with concepts depicting modern economies as being primarily shaped by ‘service’ or ‘information’ activities and can hardly be explained only by the often-postulated ‘service gap’ in the German economy that is apparent from international comparisons (see Dathe and Schmidt, 2000). They indicate that even in modern economies the largest share of employees is involved in some kind of basic ‘hands-on’ work (for example, personal services, manufacturing, transport, cleaning) and/or ‘head-on’ work (such as technical occupations or cultural production) contributing directly to the creation of material and immaterial wealth. In contrast, a clearly smaller share of employees is engaged in organising, planning, managing and control tasks that contribute, in a broad sense, to the co-ordination of the technical and social division of labour.

Quite a dissimilar result comes into view for the metropolitan economy of Hamburg. Its occupational structure is almost exactly the inverse of the occupational structure of the nation. In Hamburg, the share of transaction activities approaches half of all em-

ployees and the share of production/transformation activities is only a little above one-third. Taking into consideration that the occupations were rather conservatively classified as transactional, the figure for the size of the transactional group is most likely to be a low estimate. But as expected, the share of transaction activities is much larger in the city of Hamburg than in the country as a whole.

The index of localisation (IoL) shows even more clearly that transaction activities are greatly ‘overrepresented’ in Hamburg, where they reach an average value of 132 compared with 77 points for production/transformation activities (Table 1). Many of those transactional activities are highly networked with each other within the metropolitan region of Hamburg (see Ring and Staeglin, 1999). While this fact is well-known for some groups of economic activities subsumed under diverse headings such as the FIRE (finance, insurance, real estate) sector or advanced business services, the above overview includes transaction activities that are usually neglected like publishing, agents’ activities and auctioneering, counselling for private individuals or unpretentious activities like wholesaling, whose possibly underrated significance was briefly pointed out earlier. In the subsequent section, the single sub-

groups will be discussed following the order in Table 1 where they are ranked, within the main groups, by the value of their IoL.

6.2 Specialisations of the Metropolitan Economy

Among the sub-groups of occupations specialising in performing transaction activities, the most substantially overrepresented is 'advertising' (IoL = 345). These employees are involved in linking producers and consumers in the value chain and have grown in numbers with the progress of post-Fordist restructuring, like increasing product differentiation and market segmentation. In this sub-group, intense interrelations with customers and suppliers are essential for economic success and many locational requirements exist that are entirely fulfilled only in urban areas. Hamburg appears to have effectively specialised in advertising and, with close to 10 per cent of the total German employment (see Table 1), it has developed into a centre for that sector.

The next sub-group, 'agents/brokers/auctioneers', comprises agents' activities and many kinds of brokerage activities, regardless of the industries in which these activities take place or of the objects being handled. This sub-group thus contains occupations performing typical transaction functions and yields an IoL of 196, reflecting the marked relative concentration of these occupations and intense interrelation of these activities with the urban environment. Evaluation of precious objects like paintings, jewelry or antiques by auctioneers, for example, requires close co-operation with specialists usually only found in urban settings. Buying and selling of such non-standard goods are eased where long-lasting relationships between economic agents exist and where reputation and trust can develop in dense urban markets. Spatial proximity is equally an advantage when complicated and risky contracts are dealt with as in the culture industries when agents, artists, producing and distributing firms negotiate acceptable agreements.

A rather large fraction of the labour force is employed in the sub-group 'computing/calculation/accounting' reaching the third-highest index (IoL = 189). These employees deal mainly with numerical information—for example, planning, controlling, calculating economic processes and compiling accounts for various purposes such as taxes, financial and production planning. Many of these employees work in firms specialising in such transactional work as accounting or book-keeping, or further transactional sub-groups. Others are employed in firms conducting mainly non-transactional activities like transport or manufacturing.

Highly specialised occupations are to be found in the (very small) 'publishing' sub-group whose employees are often involved in the difficult and risky organisational and decision-making processes typical of this industry. The given figures for transactional occupations in publishing are, as mentioned above, probably underestimated since only one occupation could be classified as performing exclusively transactional tasks. Nonetheless, the IoL of 179 for publishing demonstrates Hamburg's prominent role in that sector in Germany. In fact, large daily newspapers, weekly magazines, book publishers and other media companies are agglomerated in Hamburg, making it one of the prime locations for print media in Germany. There are, for example, almost 400 magazines and 50 newspaper editions (primary and secondary) published in Hamburg (HLB, 1996).

The next three sub-groups 'insurance/banking', 'management/organisation/supervision' and 'consulting/counselling/legal representation' are also significantly overrepresented in the city, reaching indexes of about 160–170. The first two, when measured by employment shares, are also relatively large sub-groups of transactional activities. Thus, in quantitative terms, they form core parts of Hamburg's highly specialised transactional economy.

In 'insurance/banking' the insurance activities dominate—in particular, trade- and transport-related insurance as well as the life

insurance business (HLB, 1996). In the life insurance sector alone, 13 German companies are headquartered in Hamburg. Further, a special institution for facilitating contracting in insurances exists in Hamburg, the insurance exchange (Versicherungsbörse), as well large numbers of independent insurance brokers.

'Management/organisation/supervision' functions are performed in all kinds of hierarchical organisational forms regardless of the output and size of the firm. In the literature on urban development, however, the location of headquarters of large firms has attracted the most interest, since the number and size of headquarters is correlated to regional income creation and a city's status in urban hierarchies, nationally and globally. And in spite of much recent organisational restructuring, the headquarters of many firms probably still provide the most jobs in the sub-group (as well as in some other transactional sub-groups). Hamburg appears to be overimportant as a headquarters location, at least at the national level. While only 3.2 per cent of all German enterprises are located in Hamburg, 5.3 per cent of the headquarters of large companies are to be found there (RWI, 1999).¹²

In the sub-group of 'consulting/counselling/legal representation', 'producer' services occupations as conventionally defined (such as management consultants, lawyers) are now fused with occupations predominantly operating on behalf of 'consumers' (such as career advisers, consumer and job counsellors). Although business-related activities probably dominate in this sub-group, consumer-oriented activities also increase in importance and are likely to be strongly overrepresented in the urban area as well. In an analysis of employment change in Hamburg between 1980 and 1997 by Kempf and Läßle (2001), a similarly defined group of occupations 'consulting/information' shows by far the largest growth rate of all occupational groups, although from a relatively low level. Many elements of post-Fordist restructuring contribute to this growing need for consulting, counselling and legal advice

relative to the stable growth conditions of the Fordist era: geographically enlarging markets, organisational restructuring in companies, growing product diversity, privatisation and deregulation. Or, to put it more generally, the increasing insecurity, instability and complexity now faced by almost any economic agent, intensifies and multiplies decision-making problems, leading to a heightened demand for transactional expertise.

The next sub-group 'wholesale/purchasing' comprises professional tradespersons, like buyers and sellers in larger manufacturing enterprises or specialised employees of trading companies. Such activities today often imply world-wide trading and, with continuing globalisation, companies tend to enlarge their geographical scope. As is possible for many transactional activities, the traded goods (or other objects) need not even once physically touch the metropolitan area of Hamburg. The economic importance and innovativeness of such trading activities often appear underestimated in relation to the glamorous picture drawn of the high-tech and high-level business functions dominant in many existing accounts of urban change. In Hamburg, wholesale/purchasing occupations comprise an important share of all employees and reach an IoL almost 50 points above the national average. Although most of the companies employing workers in this sub-group typically conduct large-scale trade, they are, measured by employment, in no ways large themselves. About 95 per cent of Hamburg's 5600 wholesale enterprises have fewer than 20 employees and many of those are micro enterprises with fewer than 5 employees (see HLB, 1995). Obviously, many such enterprises are highly specialised in very specific markets or functions. For instance, more than 700 wholesale companies alone deal with machinery and equipment, and more than 400 with textiles and shoes.

For the present analysis 'security' occupations were also included in transactional activities, although security is in general a state function and provided by the public sector.

Here, such occupations were included that are regularly performed by private enterprises. Such occupations are overrepresented in Hamburg, showing an IoL of about one-third above 100. This reminds one that many factors can contribute to the concentration of certain activities within cities. In the case of security occupations, it is the increasing social disintegration of post-Fordist urban societies (Krätke, 1991) that causes the high percentage of such occupations in many present-day cities.

By far the largest segment of employees across all sub-groups, transactional and non-transactional, is represented by 'supportive activities' which include mostly average or lower-qualified office workers. Many of those employees execute the standardised and administrative tasks resulting from 'higher-ranking' or other transactional activities. Such supportive activities are carried out by roughly one-fifth of all employees, making them in quantitative terms clearly the dominating sub-group in the urban economy. Concurrently, support activities are the final sub-group in the ranking of Table 1 showing an IoL above 100 which indicates that they are the 'weakest overrepresented' sub-group. In accordance with theoretical predictions, such activities accordingly play the least-important 'positive' role in the functional specialisation of the city.

The last two sub-groups defined as transactional are somewhat *underrepresented* in Hamburg, but still reach considerably higher indexes than the average of non-transactional occupations. 'Testing/controlling/bill collecting' is underrepresented slightly in the urban area. Occupations included are goods examiners, warehouse managers, cashiers and cash collectors. Many such transactional occupations are now likely to be localised close to material production or distribution elsewhere.

The lowest IoL of the transactional sub-groups of occupations results for 'retail' occupations, covering, nonetheless, a relatively large share of employees. Clearly, more and more retail locations have been shifted from inner urban locations towards suburban ar-

eas. This shift primarily concerns standardised consumer goods traded in larger quantities, while locations for dealing with (and in some cases also producing) highly valuable, design-intensive or luxury goods tend to remain in inner-city areas. Examples are Scandinavian-design furniture in Copenhagen, crystal goods in Prague or fashion clothing in Paris and one might also think of cities like Antwerp, where transactional activities like wholesale and retail plus ancillary functions have agglomerated to form the world's leading centre of diamond trading.¹³

Research & Development occupations and those of the Academia constitute the next main group of activities in Table 1. As pointed out in section 5, some of these occupations may be performed with comparatively little regard to commercial or transactional considerations, but others may consist largely of transactional tasks. In total, this group is overrepresented in the city of Hamburg, although not to an extraordinary extent and, even a little less than the simple supportive transactional activities.

Furthermore, the largest sub-group of R&D occupations, 'engineers/chemists/physicists', those employees working in the core fields of natural sciences, solving technical problems and conducting much of commercial R&D, shows an even lower IoL. Only the (relatively small) sub-group of 'professors' is overrepresented significantly reaching an IoL above the average of all transactional occupations, which can be attributed to the location of 11 universities and colleges in the city. While the importance of R&D activities for innovation is obvious, these results render the often-postulated superior weight of R&D activities for metropolitan development questionable, at least in a quantitative respect. Although other German cities, especially Stuttgart and Munich in southern Germany, currently have larger shares of R&D employment (Schönert, 1999) so that a different outcome can be expected for those cities, agglomerations taken together gradually lose their dominance in R&D. Between 1976 and 1996, R&D employment has, like total employment, persis-

tently decentralised away from agglomerations towards slightly dense regions (Bade *et al.*, 2000). And, in spite of continuous outsourcing and growth of knowledge-intensive business services, almost half the R&D workers remain employed within the manufacturing sector (Bade and Schönert, 1997), a fact pointing towards the limited significance of transactional tasks and the prevalence of technical problem-solving, which might be part of the cause for the permanent decentralisation of such occupations.

The last main group of occupations to be discussed is summarised under production and transformation activities. Within this group, occupations in ‘cultural production’, although very small when measured by the percentage of employees, are at the same time the most overrepresented, as revealed by the IoL almost 50 points above 100. While some of the occupations included could also be regarded as transactional, many of those occupations—like artists, exhibition designers and performers—provide the direct human labour inputs for typical urban forms of cultural production, such as in theatres and exhibitions or for print and audiovisual media. The specifics of many forms of cultural production favour metropolitan locations for a number of reasons (Scott, 1997). The inherently complicated transactional and (material) linkage structures of that sub-group, mentioned earlier, are one important factor. Relatively small production series subject to frequent specification changes, highly skilled or specialised labour inputs required and an intense need for information exchange in the design and development stages of a production chain may add to these locational advantages of metropolitan areas.

‘Cleaning/maintenance’ occupations are overrepresented in the city simply because commercial premises are located there and require constant attention for their proper functioning. Usually these occupations are filled with workers of the urban underclass, mostly women, who thus form the large lower end of the relatively strongly fragmented labour force.

Slightly overrepresented are the occupa-

tions of ‘transport/storage/distribution’, comprising a quite significant share of total employment in the metropolitan and also the national labour force. But the degree of specialisation in such occupations (IoL = 106) is amazingly low, given Hamburg’s role as an important international sea port. This is to be explained by the fact that many of the directly and indirectly trade-related occupations are typical transactional activities—like those of shipping agents, employees in wholesale or insurance clerks dealing with imports and exports.

The number of a city’s employees in ‘personal services’ usually depends on the size of the population and is influenced by the amount of demand attracted from outside the urban region. For Hamburg, however, the given IoL is only 94, which seems to conflict with common perceptions of consumers that value the attractiveness of metropolitan environments not least for the quantity, quality and diversity of services offered—for example, in the food, accommodation or personal-care sector. Significant economies of scales achievable in urban areas, reducing the need for labour inputs, might cause this below-average specialisation. This then renders perspectives for employment creation developed around such services in larger cities—for example, in tourism—as rather limited.

The value for ‘technical’ occupations, comprising professions like technicians, laboratory assistants and machinists, is with 89 even lower than the previous index. While many of those workers might be highly qualified and specialised, like engineers, it is obvious that they are employed mainly in sites located outside the highly urbanised metropolitan area and are only selectively connected to the dense transactional web of the city.

The latter is even more true for occupations included in ‘manufacturing’, which shows an IoL of only 57 and is extremely underrepresented in Hamburg. It is relatively close to ‘resource-based’ occupations (IoL = 44), consisting here mainly of gardening and agriculture. While much large-scale standardised manufacturing has been shifted

away from the city, other, smaller-scale, technology-intensive and specialised manufacturing remained or even newly developed within the city boundaries. For instance, important manufacturing operations of the European Airbus industries and many suppliers are located in the south-west of Hamburg and the German airline Lufthansa is a large employer in the city. Other important manufacturing sectors are mechanical engineering, computers, electrotechnical and optical equipment, all generally regarded as modern and technology-based. In total, however, manufacturing occupations now play a very minor role for Hamburg's economic profile. That corresponds with the rather low IoLs for technical and R&D occupations. While the production activities centred around these technology-based sectors may be highly competitive and contribute important shares to the regional product, the prime advantage of Hamburg's economy is rooted in its multifaceted and closely interwoven transactional activities.

7. Conclusions

In the second part of the paper, four hypotheses were presented that can now be related to the preceding results. First, a classification of occupational categories into the two main groups—transaction and production/transformation occupations—could be derived on the basis of the descriptive categories developed by applying an institutionalist perspective. Although there are some limitations caused by too general or, in the sense of the approach presented, unclear job definitions, the large majority of occupations fits into one of the two main groups. R&D occupations were separated due to imprecise job demarcations and for easier analysis.

Secondly, the city of Hamburg, chosen for the case study, evidently specialises in transactional activities, with approximately half its employees in transactional occupations. In contrast, in Germany as a whole transactional occupations are performed by just over one-

third of all employees and production and transformation occupations by almost half the employees.

Thirdly, eight sub-groups of specialised transactional occupations (from advertising to wholesale/purchasing in Table 1) are very strongly overrepresented in Hamburg as measured by the index of localisation of 150 and higher. Among R&D and academic occupations, the decisive sub-group 'engineers/chemists/physicists' plays a less significant role in the city's specialisation. In view of the theoretical reasoning and empirical results presented, this is not seen as atypical of metropolitan areas. Moreover, there are also occupations classified into production or transformation that are overrepresented in Hamburg, like those belonging to the cultural sector. Although a number of high-tech industries exist within the city, manufacturing in total is extremely underrepresented.

Fourthly, there are a number of transactional occupations that do not fit easily into the common categories of producer/knowledge-intensive business services, and which are consequently often disregarded in urban analysis. Metropolitan areas can specialise in such activities, as demonstrated in the case of Hamburg by the three sub-groups of publishing, agents/brokers/auctioneers and wholesale/purchasing. Many of the occupations included require very specific knowledge, high qualifications or experience and can result in high incomes.

In spite of the limited scope of the empirical exercise presented, the results appear quite promising and the approach should be examined further on the basis of larger data-sets, comprising different types of region with respect to settlement structure and economic specialisation. Differences between urban core and fringe or other types of region will have to be considered. Moreover, in further work, self-employment and the qualification levels of employees should be included, since those factors will contribute decisively to spatial differentiation. More recent data-sets may allow for a better analysis of modern occupations (for example, in information-technology-related occupations)

since some occupational categories have been added or differentiated in the meantime in official (German) classifications. Spatial change over time could be taken into account with such data. With regard to the theoretical foundations, there is a particular need for additional scrutiny of R&D activities and for placing the approach in the context of the debates on learning and innovation. This should include a more detailed comparison with occupational categories derived from the notion of the information or knowledge-based economy. Also, looking beyond the narrow intention of the present paper, the definition of transactional activities presented allows the identification of those occupations, hierarchical positions or firms that plan and control economic exchange and have decision-making authority. Unequal power relationships between social strata and/or territories can thus be reflected by applying the categories for economic activities described here.

To conclude, the classification of occupations advanced here cuts across the usual manufacturing–services divide and also differs from the numerous categorisations developed to refine the notion of producer services. Even if this classification is not completely accepted, there can be little doubt that an important part of economic activities is related basically to the planning, co-ordination, controlling and enforcing of other economic activities, that these transactional activities demand the work of large segments of the workforce and that these workers are overrepresented in metropolitan areas like Hamburg. By reclassifying occupations from an institutional perspective, a picture of a highly diverse and specialised but also clearly structured and deeply interwoven—transactional economy can be revealed for a metropolitan region. This analysis departs from other accounts and opens up a constructive new way to view and represent the key elements of a large city's economic functions. And, recalling the fact that Hamburg is among the regions with the highest per capita income within the European Union, the city's specialisation in diverse transactional activi-

ties without doubt contributes essentially to its superior economic wealth.

Notes

1. The degree of spatial specialisation also usually depends on the qualification of employees; this factor is nevertheless disregarded in this first empirical test.
2. Suburbanisation of workplaces is disregarded, since the utilisation of data for the city area, which also comprises large low-density areas, is acceptable for the given purpose.
3. European Commission (2002): First progress report on economic and social cohesion (30 January 2002), www.inforegio.org; Meyer-Timpe (2001); Statistisches Landesamt Hamburg (20001): *Hamburger Statistisches Jahrbuch 1999/2000*; Statistisches Landesamt Hamburg (2002) Hamburg—Ein Stadtporträt in Zahlen.
4. Counties (*Kreise/Landkreise*) of Pinneberg, Segeberg, Stormarn, Herzogtum Lauenburg, Harburg and Stade.
5. For all interregional comparisons, it has to be recalled that Hamburg is (with Berlin and Bremen) one of the three *Stadtstaaten* (city-states) in Germany, which can hardly be compared straightforwardly with much larger, less densely populated regions.
6. Self-employed persons are generally not included in the total number of employees, since they are not obligatorily covered by social insurance. Self-employment is widespread in many transactional activities, such as consulting or legal advice; the results may thus be biased (Bade *et al.*, 2000).
7. Occupations typically performed in the public sector were sorted out and combined into an extra group which is not further considered since this paper focuses on the private sector. The figures for employees in the public sector are nonetheless given for the sake of completeness.
8. See Stein (2002) for a more extensive discussion.
9. In further research, quantifiable indicators might be constructed to make that decision by measuring, for example, the relative amount of work time spent on transactional and non-transactional tasks.
10. Similar problems in the classification of higher-level categories occur in Greenfield's (1966) work classifying industries into producer and non-producer activities on the basis of input–output data.
11. Although professors are usually state-employed, they are included into this sub-group

because the present inquiry is centred on the *functions* of occupations.

12. Large companies are companies with a turnover of 100 million German marks and more.
13. See Die geschenkte Stadt, *Die Zeit*, 2001, 49, pp. 84–85; Old ways meet new technology, *Time International*, 1996, 147(10), 4 March.

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Appendix

Table A1. Reclassification of occupations

Main groups/sub-groups of occupations	Code numbers of occupations ^a
<i>Transaction activities</i>	
Advertising	703
Agents/brokers/auctioneers	702, 704, 705
Computing/calculation/accounting	771, 772, 774
Publishing	683
Insurance/banking	691–693
Management/organisation/supervision	629, 701, 751, 763, 921
Consulting/counselling/legal representation	752, 753, 813, 863, 922
Wholesale/purchasing	682
Security	791–794, 803
Support activities (administrative and other)	781–784, 822
Testing/controlling/bill collecting	521, 706, 741, 773
Retail	682, 684, 685, 686, 688
<i>Research & development, academia</i>	
Professors	871
Engineers/chemists/physicists	601–612
Other scientists (natural scientists, humanities)	881–883
<i>Production/transformation activities</i>	
Cultural production	163, 171–177, 821, 831–833, 834, 836, 838
Cleaning/maintenance	804, 931–937
Transport/storage/distribution	522, 731, 732, 711–726, 742–744
Personal services	411, 901–913, 923
Technical	142, 274, 281, 282, 303, 541–549, 621–628, 631–636, 733, 734, 835, 837, 857
Manufacturing	141, 143–162, 164, 181–273, 275, 283–302, 304–403, 412–514, 531
Resource based (agriculture, mining)	11–91
<i>Public sector</i>	
Government/administration/justice	761, 762, 801, 802, 811, 812, 814
Social services/education/health	805, 823, 841–856, 861, 862, 864, 872–877, 891–893
Other	971–999

^aOccupations refer to *Berufsordnungen* in the German classification system where each *Berufsordnung* is subdivided into *Berufsklassen* being in turn sub-divided into *Berufsnennungen* (see Bundesanstalt für Arbeit (1990) *Systematisches Verzeichnis der Berufsnennungen*, Statistisches Bundesamt (1975) *Klassifizierung der Berufe, Systematisches und alphabetisches Verzeichnis der Berufsnennungen*, Ausgabe 1975, Wiesbaden. Kohlhammer).

Note: English translations/equivalents (including code numbers) of German occupations are given by the CAMSIS project, see <http://www.cf.ac.uk/socsi/CAMSIS/Data/Germany91.html>.

