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The spatial transformation of the production structure
of transnational corporations: a case study of
Volkswagen

main findings of the PhD dissertation

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Prepared at the Eötvös Loránd University, Department of Regional Science
and the Institute of World Economics, Centre for Economic and Regional Studies of the
Hungarian Academy of Sciences

Budapest, 2015

Introduction and aims of the research

For companies in the world's large development centres the economic upturn following the Second World War made possible the conquest of new markets and unlimited growth. Companies constructed a commercial system on a global scale within the framework of the time, reforming the world's economic map, which to that point had consisted of only regional markets. Thanks to production points established near the most important market outlets the spatial structure of production changed, with an increasing number of countries becoming part of the increasing number of production and distribution systems that integrated national economies. Thanks to the ending of one era and the beginning of a new one in the 1970s, companies that had previously spread their production and distribution over several countries became transnational corporations that overarched national economies. Their development entailed a bigger emphasis on the structure of the corporate organisational system and the structure of relations within the company. The relationship between parent company and subsidiaries also changed, in turn transforming the spatial structure of production. Today, companies organise their activities according to global value chains, of which a definitive factor is competition. In an intensifying international competitive environment the advantages that can be gained at the local level have become even more emphasised for companies that produce at several points.

This thesis deals with the transformation of the spatial aspect of transnational corporations' production structure, which is studied through an examination of Volkswagen's international development. The geographic distribution of data on production, sales and employment between 1950 and 2010, the transformation of the division of labour within the company, and the relationship between the parent company and subsidiaries all underwent notable transformations in the examined period. The examined period incorporates the time of dynamic growth following the Second World War, the structural and spatial transformations in production in the 1970s and 1980s, as well as the strengthening processes of globalisation. Through the expansion of opportunities in the examined six decades (i.e., developments in technology and labour organisation, information technology and communication developments) the geographic structure of Volkswagen's value chain underwent significant change. The then-new investment strategy of the 1950s - which defined production, targeted new (export) markets and was market-oriented - has now been transformed. Corporations use locally accessible advantages on a global scale, and based on such they optimise and organise worldwide production and distribution systems. Today, subsidiaries are organised into networks according to value chains, which serve both the corporation and the presence and competitiveness of the brand.

Beyond analysing the history of the corporation, this dissertation makes use of the results of scientific research on the development of Volkswagen. **The long-term spatial analysis of data**

on production, sales and employment make up the backbone of the thesis. Based on calculations conducted on the six-decade spatial database, the thesis analyses the spatial transformation of the company's production structure. Analysing the given development phases, the author emphasises the presentation of the deeper correlations of change. Analysis of the database composed by the author is used to trace the company's development, and is supplemented with original results.

Theoretical approach, methodology and literature review

The author conducted the spatial analysis by making use of the existing theoretical frameworks of corporate research and database analysis. Given the foundation of corporate research, the literature is rather diverse; as a result the author makes use of not only geography and spatial studies, but also turns to economics, corporate economics and management sciences.

The theoretical framework is based on geographic results, including but not limited to the work of Sárfalvi (1994), Enyedi (2000), Horváth (2000), Nemes Nagy (1996, 2004) and Rechnitzer (2000, 2012, 2014) analysing spatial processes, as well as Barta's (2001, 2003, 2012) research on the industrial spatial structure in Hungary and Central Europe.

The economic and corporate research background is informed by Dunning's (1993) work on summarising theories on the development of international production, and work on the spatial organisation of transnational corporations by Johanson and Wiedersheim-Paul (1975), Håkanson (1979) and Bartlett and Ghoshal (1998), as well as Dicken (2003).

Research on the spatial organisation of transnational corporations in Hungary has been conducted by Bernek (2002, 2003, 2006, 2007), while Csiki (2004) and Schottner (2009) have researched the spatial structure of US corporations, with Juhász (2006) having researched the geographic distribution of German transnationals. Regarding the auto industry and global production, geographic analyses on the international divisions of labour have been conducted by Molnár (2012) with an eye to branch commerce; Lukovics and Savanya (2012) have done research on regional structures based on value chains; while Grosz (2000) has worked on vehicular industry clusters.

Corporate research to a significant degree rests on the results of empirical research on the history and development of Volkswagen, including Brumlop - Jürgens (1983), Jürgens (1994, 1998, 2002), Tolliday (1995a, 1995b), Haipeter (2002), Pries (2003), Brick (2004) and Rieger (2013). In the interest of deeper analysis and to clarify given issues, corporate interviews were conducted.

The bulk of market reports, corporate information on Volkswagen, statistics, production-, employment- and sales data were collected from annual reports on Volkswagen between 1950 and 2010 as well as other statements released by the company, historical overviews and business presentations.

The analysis is based on significant statistical and empirical work. The database was constructed using a wide array of international resources. Source research and the construction of the database took over a year, given that systematised corporate data on Volkswagen in given markets and regions is not available. In the case of years with no data, national-level production-, employment- and sales data was utilised along with the reports of various organisations and alliances. This entails statistics from the UN, CEPAL, OICA and ACEA as international organisations, and the NADA, AMIA, ANFAVEA, ADEFA, JAMA, FEBIAC, ZAP SR and PAIZ, which are the vehicle industry corporate alliances in the USA, Mexico, Brazil, Argentina, Japan, Belgium, Slovakia and Poland respectively.

The backbone of the research consists of the spatial and statistical analysis of the Volkswagen Group's number of employees, level of production and number of units sold between 1950 and 2010. Using a number of methods of inquiry the author used the spatial distribution of various indicators to compare Volkswagen's global expansion and the spatial organisation of its activities with empirical findings on the company's development. Beyond analysing data in detail the dissertation used several statistical methods to explore correlations. Using the Hoover index helped to explore the distribution of spatial indicators in relations to one another. Pearson linear correlation coefficients were used to measure the strength of relations between spatial indicators (determination). The strength of relations helped verify and supplement a number of earlier theories (Sturgeon - Van Biesebroeck 2011) on the development of Volkswagen, shedding light on newer correlations.

Research findings

The empirical results of the dissertation contribute to past research on the topic with new details, shedding light on the components of the development of corporate spatial structure. The main findings of the research are summarised below:

1. By examining the development and spatial distribution of production, sales and employment, the author shows that Volkswagen's international expansion over the last six decades is not only about increased sales, but that **the spatial pattern of the production structure influenced presence in certain strategic locations**. In the 1950s Volkswagen appeared in several new overseas markets (Brazil, Mexico, South Africa, Australia).

Export was soon replaced by local assembly, which, thanks to restrictions on foreign trade, resulted in beginning local production. The expansion of local production in cases of limited local markets was ensured by export sales. The latter was not a given for every subsidiary. For example, the Australian plant was closed at the end of the sixties, in part because of a drop in local demand, and in part because of increased competition. Similar limitations affected opportunities for the South African and Argentinian plants, which until the 2000-s did not show significant growth. Despite a promising launch in the 1970s, Yugoslav production was ceased at the beginning of the 1990s at the time of the Balkan conflicts. After its relaunch its significance diminished thanks to new plants in Central Europe.

2. Using the database he assembled the author examines the spatial distribution of production, sales and employment. The transformation process is broken down into periods, which help show that **beyond changes in the international economic context, the given periods signify changes in the company's geographic pattern.**
3. Thanks to Volkswagen's international expansion a global production and distribution system came to be. At the same time sales data shows **that the company's sales policy reflects an entirely different kind of organisation, with focus on mostly regional or emphasised markets.** Focus was on the European region (with an emphasis on Western Europe outside of the FDR), mostly the US market within North America, and the six countries that housed production in the rest of the world (Brazil, Argentina, Nigeria, Republic of South Africa, China and India).
4. The analysis of the spatial development of production and sales data have confirmed one of the most marked findings of research on the auto industry, according to which **companies organised their production and sales activities based on large regions and regions from the 1980s on.** This position is supplemented by the observation that this structure can be observed in an earlier phase of internationalisation, namely 1950-55. The author's analysis of the data shows that **there are significant differences between regions. From the point of view of spatial organisation, the spatial organisation of European production continues to be of key importance to Volkswagen compared to other regions.**
5. Throughout the research project the author - using the calculations on the database he created - compares empirical studies of the development of Volkswagen with theoretical approaches. **Results from the analysis of production and sales data matched and in many instances supplemented Pries' (2003) approach to examining the process of internationalisation with empirical methods.** An examination of the relationship between production and sales shows that defined periods match the times of the rebirth of

the company's organisation. In the earlier period, which lasted until the end of the 1960s, the relationship between production and sales weakened, and inequality deepened. In the next period the increase in production at the subsidiaries reflected a new strengthening and rebalancing of the relationship. **In the period that followed organisational changes and the results attained from the database show divergence, meaning that the definition of periods had to be modified, whereby the author delineated two new periods.** These periods - from the end of the 1970s and following the 1990s - **draw our attention to new processes in the relationship between production and sales.**

6. The long-term examination of the relationship between production and employment led the author to show that the 1980s brought a change in the company's labour force policy. **By examining indicators and corporate research (empirical examples) the author confirmed that the company's production structure, and development of production and employment from the 1980s, was geographically distinct when comparing West Germany to the subsidiaries.**
7. **The significance of the development of the relationship between production and employment and of organisational and technological changes in the value chain in the examined period is highlighted. These draw our attention to important structural processes.** The relationship between the two indicators weakened from the middle of the 1980s. This is partly explained by the company's position, partly by the consolidation processes at the new production units, and partly by corporate policy on production in West Germany. The process gained in strength from the 1990s. **The number of vehicles per worker in the German and foreign plants - i.e., productivity between the parent company and the subsidiaries - is significantly different. The differences have mainly structural causes, which can be explained by the spatial organisation of production.**
8. The existence of specialisation can be detected through spatial correlation between production and employment. Specialisation in the case of European units – predominantly at production points in Germany and Central and Eastern Europe – is revealed in relatively higher share of employment, while in the case of Brazil and China in relatively higher share of output.

Conclusions

Based on the literature that provided a foundation for the research, information gathered from corporate research and work on the database, the dissertation came to numerous conclusions.

There is no binding law on the development of plants and production points. The establishment of production points is often the result of a sovereign corporate decision, and in addition their operation and success is significantly influenced by transformations in the industrial branch, localisation factors (size and development of internal market, competition situation, export opportunities, etc.).

Volkswagen's internal value chain is organised globally, with Europe at its centre, and within that having most components and partial units produced in Germany and Central Europe.

Since the 1990s, in the globally organised processes of production and sales Europe's share is preponderant. Within Europe the spatial distribution is this: Germany and Central and Eastern Europe are marked by production while the Western European export markets by consumption. The spatial aspect of Volkswagen's production strategy is subordinate to maintaining and increasing employment in Germany.

Specialisation is of key importance in the case of spatial structure of production. The pattern of production spatial organisation shows that from the 1980s sales in West Germany and even foreign plants could not be interpreted as merely local (production for only the local market). Increases in production were accompanied by increases in exports. Export meant not only complete vehicles, but significant intra-company trade in parts and partial units.

Production technology (platform, modularisation) and organisational developments (outsourcing, specialisation) are definitive in the company's international production structure, i.e., in the spatial organisation of the value chain.

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¹ See full list of publications at: <https://vm.mtmt.hu//search/slist.php?lang=0&AuthorID=10017362>

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