

Japanese versus German Supremacy in the Global Automotive Sector

Cătălin Grădinaru
Sorin-George Toma

University of Bucharest, Faculty of Administration and Business, Romania

catalin.gradinaru@faa.unibuc.ro

tomagsorin62@yahoo.com

Loredana Nicoleta Zainea

Bucharest University of Economic Studies, Doctoral School of Management, Romania

Loredananicoleta.zainea@gmail.com

Abstract

Worldwide, companies in the automotive sector are constantly trying to improve and optimize their business processes and the way the components that define their business ecosystem are integrated, in order to reach global supremacy, often expressed through revenues, profits or number of employees. It seems that a constant clash between Japanese and German companies is happening on this huge stage.

The aim of the paper is to portray the existing, intense competition between Japanese and German automotive companies using criteria such as revenues, profits, number of employees backed by 2019 data and highlighting notable differences in their production systems. The methodology used is quantitative and based on the research of secondary sources such as articles and reports (ranks). The findings show an intense competition between companies in the automotive sector and a concentration of power from the two main power poles that are subject to this paper: Japan and Germany; the supremacy is yet to be decided.

Key words: Toyota, Volkswagen, rank, automotive industry, motor vehicles and parts sector

J.E.L. classification: F00, M11

1. Introduction

The motor vehicles and parts sector is characterized by fast-pace “changes in demand and production practices” (CollegeGrad LLC, 2020) that force companies to act and react, to adapt and anticipate as fast as possible, pushing themselves and all stakeholders involved towards achieving success through various innovations (for example, in their production systems) that may give them the edge: a clear, yet unstable, competitive advantage. This sector is a major contributor to the economy in terms of the number of jobs created (in adjacent industries as well), incomes generated, taxes paid, goods created, excellent performance of services, employee-technology collaboration, etc. Even though the global automotive industry was severely impacted by the financial crisis from 2008-2009, this specific market started to readjust and manage to find ways to reconfigure itself and the companies managed to get back on track. Now, we are noticing a “return of the crisis” (Wagner, 2020) generated by the current coronavirus situation. Managing to lock in their positions as important players (Grădinaru et al., 2018, 68), Toyota and Volkswagen are dominating the automakers worldwide (only performing a castling between the former leader by revenues from 2018, Toyota Motor, with the leader from 2019, Volkswagen).

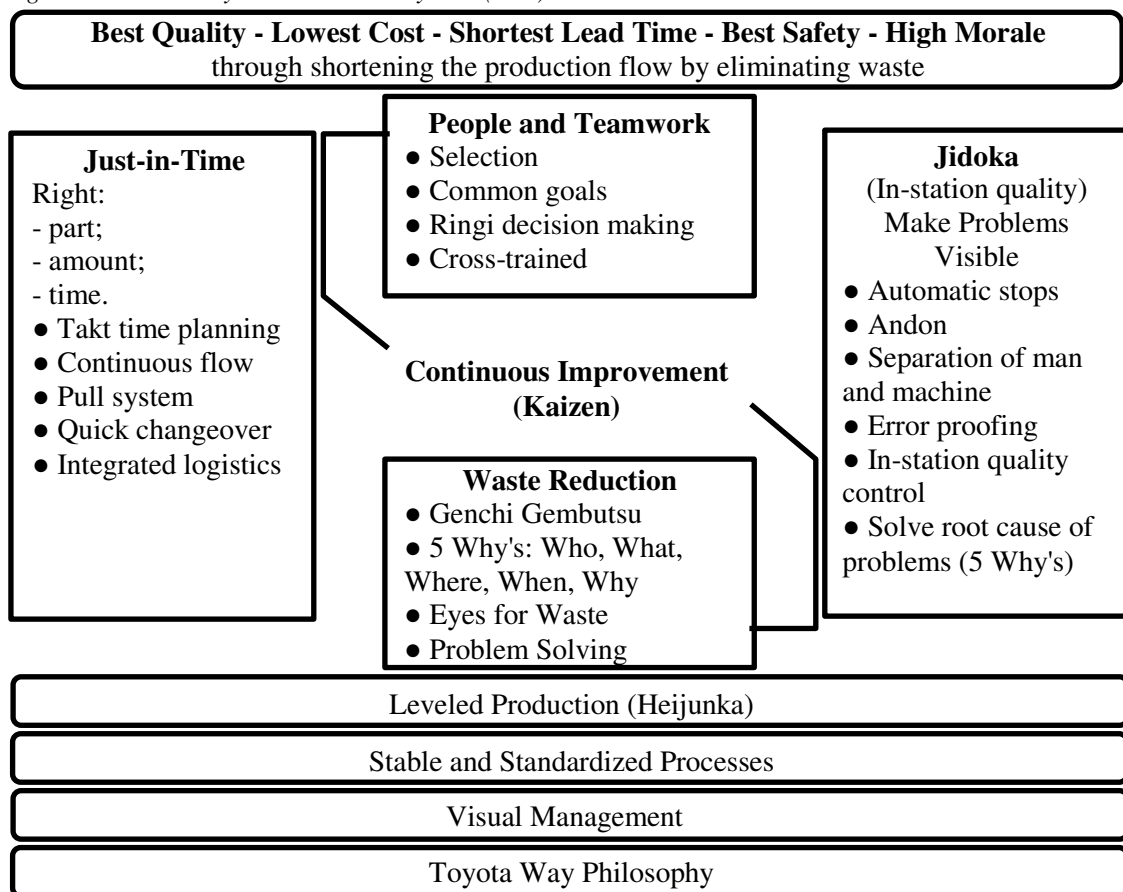
This sector is highly dominated by companies from countries such as Germany, Japan, China, the United States, France, South Korea, Sweden, India or Canada. Although there are many competitors in this sector, two major sides stand out: German and Japanese companies. Notable mentions of important actors on this sector are the following: Volkswagen, Toyota Motor, Daimler, Ford Motor, General Motors, etc.

The aim of the paper is to highlight the existing distinctions between the two giants from the motor vehicles and parts sector, Japan and Germany, using criteria such as revenues, profits and number of employees based on 2019 data. The other sections of the paper are organized as follows: the second section is based on literature review; the third section is aimed at the used methodology; the fourth section highlights the findings of the research; the paper ends with the authors' conclusions.

2. Literature review

A great way to portray the fierce competition between Japanese and German companies in the automotive industry is to refer to examples of best practices, of business excellence models, placing quality as "a key element of their business philosophy" (Toma et al., 2018, 966). "Striving for excellence has become a top priority" (Toma et al., 2017, 567) for companies around the world and so many companies are conducting benchmarking activities in order improve their position and performance. From this point of view, Japan has a key representative, a true inspirational model for their competitors: the Toyota Motor company - the most profitable company in the world in the motor vehicles and parts sector. At the heart of the company lies the Toyota Production System (TPS) (figure no.1.), the epitome of a holistic integrated "production system that comprises those best practices integrated and tightly linked" (Bergenwall et al., 2012, 375).

Figure no. 1. The Toyota Production System (TPS)

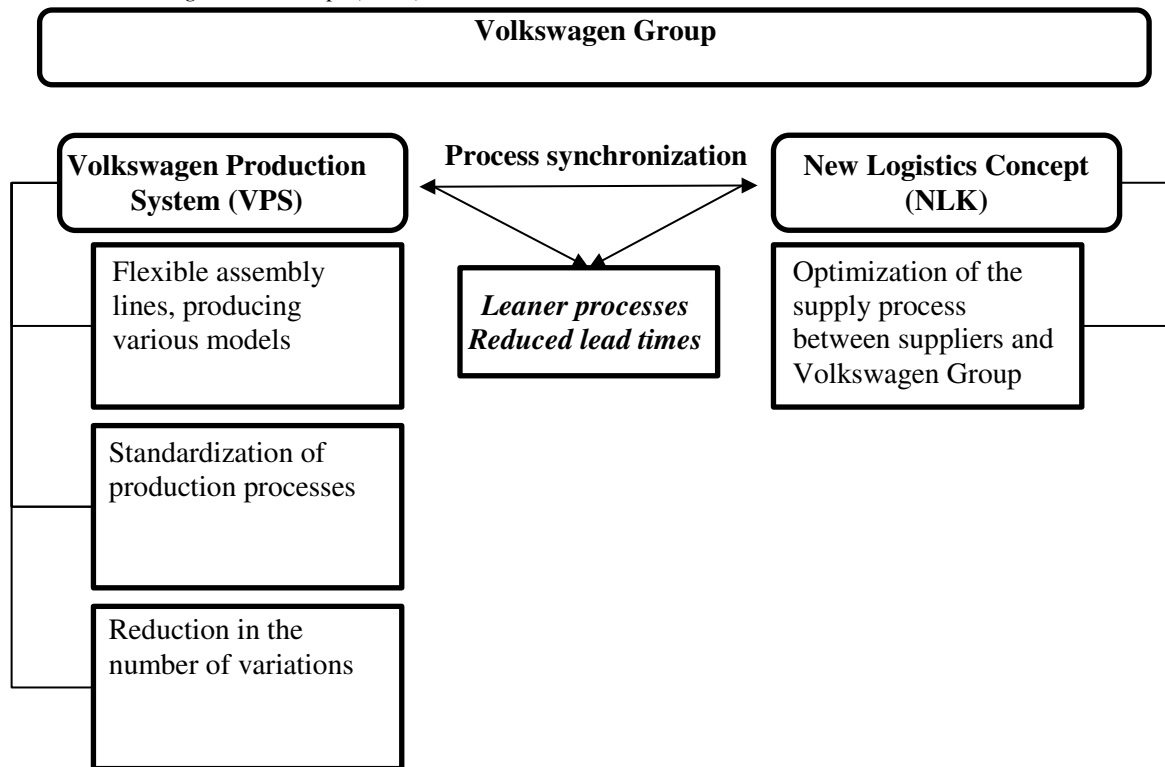


Source: Adapted from (Liker, 2004, 33)

Considered a certification of productivity, the TPS focuses on Kaizen, a philosophy emphasizing continuous improvement (Kiran, 2020, 155) and learning, shaping the organizational behavior and sustaining the work culture (Paladugu and Grau, 2019, 561). An important notification refers to the fact that "lean manufacturing evolved from TPS" (Naruo et al., 2007, p.387).

The key figure of Germany is portrayed by the Volkswagen Group, the 2019 leader in the motor vehicles and parts sector by revenues. In order to compete and with its biggest competitor, Toyota, Volkswagen is trying to barricade their position and improve their operations and their “production systems of tomorrow” (Volkswagen, 2019) by synchronizing their Volkswagen Production System (VPS) with their New Logistics Concept (NLK) (figure no. 2). Volkswagen has also implemented a modular production system, in which “the component suppliers finance a part of the factory and organize the assembly of their components on site” (Abreu et al., 2000, 265).

Figure no. 2. The Volkswagen Group Strategy: The Volkswagen Production System (VPS) and the New Logistics Concept (NLK)



Source: adapted from (Ivanov et al., 2019, p.112)

The German car maker intends to make their production more efficient through their production system, the “Wolkswagen Way” (in German: Volkswagen Weg), its role model being “Toyota’s principle of continuous improvement known as Kaizen” (Wimmer et al., 2012, 81).

3. Research methodology

In order to attain the research objective, the methodology used by the authors was based on a quantitative research method. The information used in order to analyze the situation displayed by the top ten companies in the world from the automotive sector and, implicitly, to portray the competition between Japanese and German companies, comes from sources of secondary data, such as books, articles and reports (ranks). The literature review was realized using electronic databases.

4. Findings

This chapter is focused on the various elements that play an important role when trying to answer the question connected to which country holds the lead in the motor vehicles and parts sector on a worldwide scale.

The data used in the analysis comes from the Global 500 rank for 2019, Fortune's annual publication of the world's largest companies worldwide, ranked by total revenues. The research was also based on profits and number of employees.

The first criteria used in the Japanese versus German supremacy analysis in the motor vehicles and parts sector is revenues (table no. 1).

Table no. 1 Top 10 companies in the world by revenues from the motor vehicles and parts sector in 2019

Rank	Global 500 Rank	Name	Country	Revenues (\$M)
1	9	Volkswagen	Germany	\$278,341.50
2	10	Toyota Motor	Japan	\$272,612.00
3	18	Daimler	Germany	\$197,515.30
4	30	Ford Motor	United States	\$160,338.00
5	32	General Motors	United States	\$147,049.00
6	34	Honda Motor	Japan	\$143,302.90
7	39	SAIC Motor	China	\$136,392.50
8	53	BMW Group	Germany	\$115,042.80
9	66	Nissan Motor	Japan	\$104,390.60
10	77	Bosch Group	Germany	\$92,601.90

Source: (Fortune, 2019)

The top companies in the world by revenues portrays the domination of German companies in the motor vehicles and parts sector, both in terms of having Volkswagen as the leader and having four companies situated in the top 10. Its' follower, Toyota Motor, is situated really close to the German manufacturer, with a difference of \$5,729.5. Both companies prove their domination, due to the big gap (of more than \$75,000.00) between them and the third company on this rank, another German company, Daimler; the further along we analyze the rank and direct our attention towards the tenth company in the rank, the more substantial the difference.

Using the country criteria, it is clear that the rank is dominated by Germany (four companies out of the first ten: Volkswagen, Daimler, BMW Group and Bosch Group), followed by Japan (three companies in the top ten: Toyota Motor, Honda Motor and Nissan Motor); the remaining places are occupied by the United States (two companies: Ford Motor and General Motors) and China (one company: SAIC Motor). The cumulated values of the revenues belonging to the four German companies situated in the top 10 rank is \$683,501.5 and, when compared to the cumulated one specific to the three Japanese companies, \$520,305.5, one could clearly see how important it is to have one more company placed among the top 10 companies.

If we are to look at companies' positions relative to the global 500 companies (neglecting the sector criteria), the same remarks could be made in connection to the first and second companies in the top ten rank within the motor vehicles and parts sector, underlying the idea that Volkswagen (9th on the global 500 rank) and Toyota Motor (10th in the top 500 global rank) are in a fierce competition.

The second criteria used in the analysis is represented by the profits of the top ten companies in the world belonging to the motor vehicles and parts sector in 2019 (table no. 2).

Table no. 2 Top 10 companies in the world by profits from the motor vehicles and parts sector in 2019

Rank	Name	Country	Profits (\$M)
1	Toyota Motor	Japan	\$16,982.00
2	Volkswagen	Germany	\$14,322.50
3	Daimler	Germany	\$8,555.00
4	BMW Group	Germany	\$8,399.30
5	General Motors	United States	\$8,014.00
6	Honda Motor	Japan	\$5,504.60
7	SAIC Motor	China	\$5,443.80
8	Renault	France	\$3,896.90
9	Ford Motor	United States	\$3,677.00
10	Bosch Group	Germany	\$3,596.00

Source: (Fortune, 2019)

The rank specific to the top companies in the world by profits highlights a change within the leader's placement, shifting from the German Volkswagen (leader by revenues) to the Japanese Toyota Motor company. The gap between the leader and the follower is quite significant: \$2,659.5, approximately 15.67% more in favor of the leader, of course (a number especially relevant when having in mind that one main purpose a company has is registering and, implicitly, increasing its profits). Another similarity to the rank by revenues is the fact that the leading two companies are far apart from their competitors (for example, the leader, Toyota, has almost twice as much in terms of profits than the 3rd placed company - Daimler); the difference is truly impressive when comparing Toyota Motor to Bosch Group, the 10th company in this rank: about 4.7 times more in favor of, obviously, the leader.

This rank still shows a numeric German company domination (four companies among the top 10: Volkswagen, Daimler, BMW Group and Bosch Group) over the Japanese ones (two companies: Toyota Motor and Honda Motor, losing one company when compared to the rank where the revenues criteria is used); the rank is completed by the United States (with the same two companies found in the rank by revenue: General Motors and Ford Motor), China (SAIC Motor) and France (Renault).

If we take into consideration the cumulated revenues of the companies from Germany and compare them to the specific ones from Japan, then a significant situation arises: \$34,872.8 (four German companies) as opposed to \$22,486.6 (from the two Japanese companies).

The final criteria used when analyzing the power of the German and Japanese companies in the global top 10 companies from the motor vehicles and parts sector is the number of employees in 2019 (table no. 3).

Table no. 3 Top 10 companies in the world by number of employees from the motor vehicles and parts sector in 2019

Rank	Name	Country	Employees
1	Volkswagen	Germany	664,496
2	Jardine Matheson	China	370,870
3	Bosch Group	Germany	298,683
4	Toyota Motor	Japan	199,000
5	Daimler	Germany	173,000
6	Sumitomo Electric Industries	Japan	219,722
7	Continental	Germany	147,738
8	Honda Motor	Japan	134,682
9	Peugeot	France	148,513
10	Ford Motor	United States	409,881

Source: (Fortune, 2019)

The situation according to the number of employees criteria depicts Germany as the clear leader, both when referring to the leading company, Volkswagen, and in terms of the number of companies situated among the top 10 (four companies as opposed to three Japanese ones). Only looking at the leader one could easily notice the huge difference from all the other companies (cumulating the second and third places shows that they would only exceed Volkswagen by 5,057 employees). When only comparing the German leader to the cumulated employee values belonging to all three Japanese companies from this rank, the Japanese are still short: 111,092. Still, this situation is not necessarily a negative facet of Toyota Motor situation, but, on the contrary, it can prove the efficacy incorporated in lean manufacturing and, thus, outlining the majesty of the Toyota Production System.

5. Conclusions

The automotive industry is going to continue to have giant competing companies, constantly challenging each other in their pursuit for industry supremacy. The paper has shown that there are so many factors when trying to take a decision in favor of either sides, Japanese or German companies, as being the global automotive sector winner. Only one thing is clear: the pursuit is going to be tougher as competition becomes fiercer.

Further research may be oriented towards comparing multiple production systems.

6. References

- Abreu, A., Beynon, H. and Ramalho, J.R., 2000. 'The Dream Factory': VW's Modular Production System in Resende, Brazil. *Work, Employment & Society*, 14(2), pp. 265-282
- Bergenwal, A.L., Chen, E. and White, R.E., 2012. TPS's process design in American automotive plants and its effects on the triple bottom line and sustainability. *International Journal of Production Economics*, 140(1), pp. 374-384
- CollegeGrad LLC, 2020. *Motor Vehicle and Parts Manufacturing Industries*, [online] Available at: <<https://collegegrad.com/industries/motor-vehicle-and-parts-manufacturing>> [Accessed 28 May 2020]
- Fortune Media IP Limited, 2020. *Fortune Global 500*, [online] Available at: <<https://fortune.com/global500/2019/search/?sector=Motor%20Vehicles%20%26%20Parts>> [Accessed 28 May 2020].
- Grădinaru, C. and Toma, S.-G., 2018. The largest corporations in the world in the period 2016-2017, *Annals of the „Constantin Brâncuși” University of Târgu Jiu*, Economy Series, Special Issue, 2018, pp. 68-73
- Ivanov, D., Tsipoulanidis, A. and Schöngerger, J., 2019. *Global Supply Chain and Operations Management. A Decision-Oriented Introduction to the Creation of Value*. 2nd Edition. Cham: Springer
- Kiran, D.R., 2020. *Work Organization and Methods Engineering for Productivity*. Oxford: Elsevier
- Liker, J. K., 2004. *The Toyota Way*, New York: McGraw-Hill
- Naruo, S., Toma, S.-G., 2007. From Toyota Production System to Lean Retailing: Lessons from Seven-Eleven Japan. In: Olhager J., Persson F., eds., *Advances in Production Management Systems* Boston: Springer, pp. 387-395
- Paladugu, B.S.K. and Grau, D., 2020. Toyota Production System – Monitoring Construction Work Progress With Lean Principles. *Encyclopedia of Renewable and Sustainable Materials*, 5, pp. 560-565
- Toma, S.-G. and Marinescu, P., 2018. Business excellence models: a comparison, *Proceedings of the International Conference on Business Excellence*, 12(1), pp. 966-974
- Toma, S.-G. and Naruo, S., 2017. Total Quality Management and Business Excellence: The Best Practices at Toyota Motor Corporation. *Amfiteatru Economic Journal*, 19(45), pp. 566-580
- Volkswagen, 2019. *Volkswagen 4.0 – the production systems of tomorrow are being developed in the Gläserne Manufaktur in Dresden*, [online] Available at: <https://www.volkswagen-newsroom.com/en/press-releases/volkswagen-40-the-production-systems-of-tomorrow-are-being-developed-in-the-glaeserne-manufaktur-in-dresden-4753> [Accessed 24 May 2020]
- Wagner, I., 2020. *Revenue of leading car manufacturers worldwide 2019*, [online] Available at: <https://www.statista.com/statistics/232958/revenue-of-the-leading-car-manufacturers-worldwide/> [Accessed 25 May 2020]
- Wimmer, E. and Mani, A., 2012. *Motoring the Future. VW and Toyota. Vying for Pole Position*, Hampshire: Palgrave Macmillan