



What's Driving Porsche?

Rebecca Henderson, Cate Reavis

There are some customers who love the idea that an engineer working on their project in the afternoon was the same guy working on a 911 motor in the morning.

—Managing Director, Porsche Engineering Group¹

We were working with Volkswagen on the next generation of the Cayenne (which shared its structure with the VW Touareg and Audi Q7) and I wanted a clear connection to safeguard Porsche's interests. We could not do this alone.

—Porsche CEO Wendelin Wiedeking, on decision to acquire VW²

In early March 2008, Porsche's supervisory board, which included the chairman of the Volkswagen Group, Ferdinand Piëch, agreed to raise its holding in Volkswagen from 31% to 50% giving it a majority stake.

Porsche's takeover of VW was seen by many as a wise move for the small, independent car company that, unlike rival brands Jaguar, Ferrari, Lamborghini, and Lotus, had managed to avoid being gobbled up by the auto industry's behemoths the likes of General Motors, Chrysler and Ford. There was, however, a key strategic question about Porsche's acquisition of VW that was not receiving a lot of press: Would the long-term stability of Porsche's engineering and design prowess be at risk by bringing VW "in-house"?

¹ Scott Miller, "Road More Traveled," *The Wall Street Journal*, August 21, 2002.

² Ray Hutton, "Porsche Set to Take the Wheel at VW," *The Sunday Times*, October 14, 2007.

This case was prepared from published sources by Cate Reavis under the supervision of Professor Rebecca M. Henderson. Professor Henderson is the Eastman Kodak Leaders for Manufacturing Professor of Management. This case is based on research conducted by Julien Heider, Jody Muehlegger and Konrad Haunit (MIT Sloan MBAs, Class of 2008).

Copyright © 2009, Rebecca M. Henderson. This work is licensed under the Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 Unported License. To view a copy of this license visit <http://creativecommons.org/licenses/by-nc-nd/3.0/> or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, USA.



Engineering and design were considered the hallmarks of Porsche's competitive advantage, and rather than keeping its R&D under tight wraps, Porsche shared its R&D team of 2,300 engineers with outside companies, and had built a lucrative engineering services business based on this model. Through its 100% wholly-owned customer engineering development company, the Porsche Engineering Group (PEG), Porsche made its wide-ranging expertise in the development and production of vehicles available to clients from a variety of industries. PEG was considered Porsche's "secret weapon, enabling it to employ more engineers than if it worked alone, giving it an edge in product development."³ Porsche's small size and market niche made it easier for other auto manufacturers to trust that Porsche would not use the technology knowledge attained through its engineering services division to compete head-to-head.

Bringing the R&D functions of the two firms too close together could potentially weaken Porsche engineers' sense of belonging and demotivate them. While Porsche was a company that thrived on healthy profit margins, VW's business model was all about volume. Furthermore, if Porsche engineering was too closely associated with the entire VW portfolio, the company could lose its ability to sell external engineering to other OEMs concerned that Porsche would be sharing strategies and innovations with VW. The question facing Porsche's senior leadership was how to ensure that the integration of VW did not negatively effect Porsche's outside engineering business.

Porsche

Porsche was founded in 1931 by Ferdinand Porsche, along with his son and son-in-law, Anton Piëch, father of VW Chairman Ferdinand Piëch. Known in its early days as the Porsche Engineering Office, Porsche did not start off as an automaker, but rather a firm that sold design and engineering services to other carmakers. In 1934, Adolf Hitler commissioned Porsche to make a "people's car" or "volkswagen." The forerunner to the VW Beetle, the VW Type 60 hit the roads in the mid-1930s, and in 1938 the first plant dedicated to the manufacturing of the VW was opened. It wasn't until 1948, three years after the end of World War II, that Porsche produced its first branded sports car. Within two years, the Porsche 356 series rolled off the production lines.⁴

By 2007, Porsche was the world's most profitable automaker on a per unit basis,⁵ a feat that was especially impressive considering it produced just over 100,000 automobiles annually. The company's recorded average revenue per car of €2,568 (\$91,974) dwarfed that of Mercedes's €10,445 (\$59,454), BMW's €34,766 (\$51,106) and was nearly 2.5 times Audi's €27,500 (\$40,425).⁶ In an industry where scale was usually considered a prerequisite for reducing production costs, the company's operating margins of nearly 20%, double those of Toyota,⁷ made Porsche an exception to the rule. In 2007, Porsche's income topped \$9.4 billion on revenue of \$10 billion. (See **Exhibit 1** for

³ Bret Oreckson, "Engineering Is Porsche's Secret Weapon," *Automotive News*, January 15, 2001.

⁴ Adler, Dennis, *Porsche: The Road from Zuffenhausen*, 2003, p. 76.

⁵ Jeremy Cato, "Porsche Revs Up for Explosive Growth," *The Globe and Mail*, February 22, 2007.

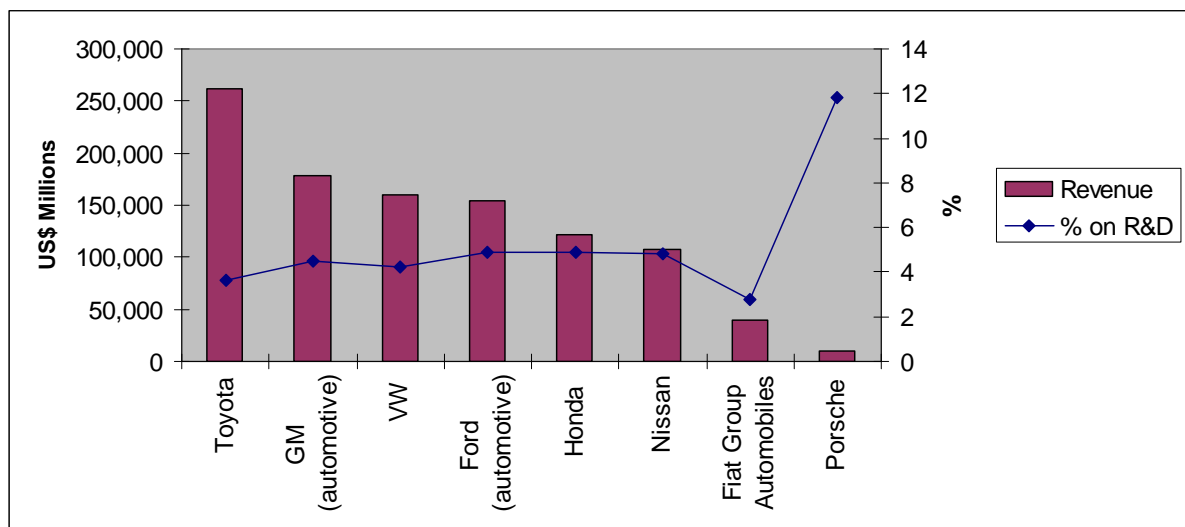
⁶ € = US\$1.47 (December 31, 2007)

⁷ Gail Edmondson, "Pedal to the Metal," *BusinessWeek*, September 3, 2007.

select financials of Porsche and the top automakers.) Ironically, over 60% of Porsche's pre-tax earnings came from trading derivatives. All of the options trading Porsche was involved in pertained to its stake in VW. Porsche used the options to hedge against the likelihood that VW's shares would rise after its interest was made public.⁸

Porsche was renowned for the quality of its products. For three consecutive years (2006-2008), Porsche was the top ranking brand in J.D. Power and Associates "Initial Quality Study" (IQS). The study ranked brands by the fewest problems per 100 vehicles. Porsche spent about 12% of revenue on R&D compared to an industry average of 4% to 6%. (See **Figure 1**.) Approximately 19% of Porsche employees worked in its R&D facility compared to 6.6% at Volkswagen.

Figure 1 R&D Expenditure as % of Revenue for Select Auto Makers (2007)



Source: Annual Reports.

Turnaround

Porsche hit a speed bump in the early 1990s when production processes described as "fat and wasteful"⁹ and a weak U.S. economy sent orders plummeting. Between 1986 and 1993 Porsche's sales had fallen from more than 50,000 units to 14,000 units.¹⁰ The company was teetering on the verge of bankruptcy, and there were whispers about a possible takeover.

⁸ Richard Milne, "Share Options Put Porsche on a Faster Path to Profit," *Financial Times*, November 12, 2007.

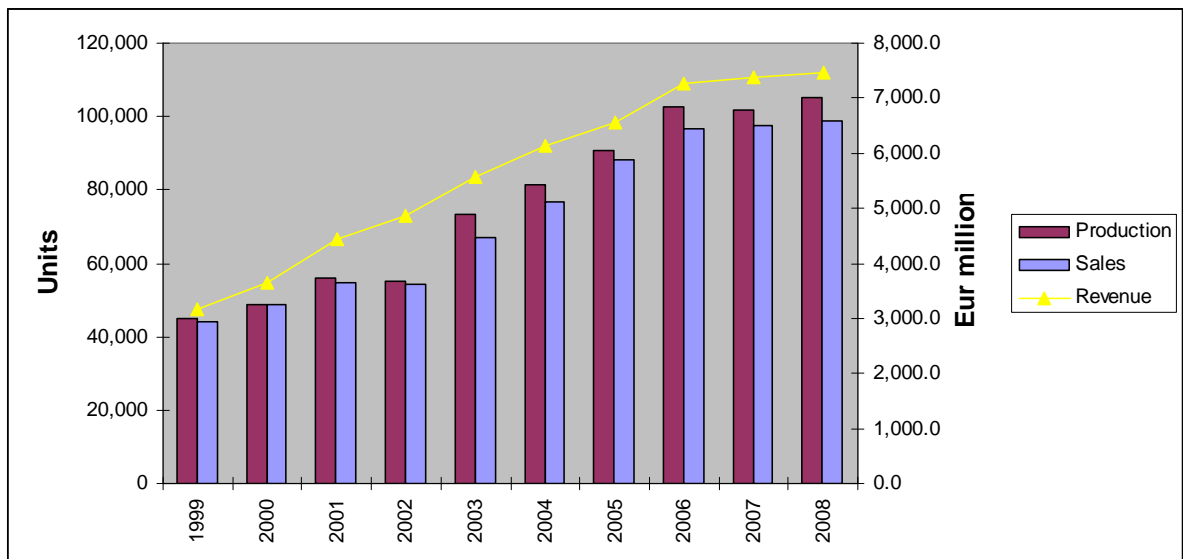
⁹ Tom Mudd, "Back in High Gear," *Industry Week*, February 21, 2000.

¹⁰ *Ibid.*

Newly named Porsche CEO Wendelin Wiedeking orchestrated a turnaround focused on building new core competencies in lean manufacturing and synchronized engineering. In the past, Porsche's celebration of craftwork encouraged individuals to work on their own processes rather than collaborating with the entire production line. But this soon became a significant handicap for the company. Engineers were tempted to ignore the need for cross-department cooperation on Porsche's own car designs while making handsome profits for Porsche on outside sales of engineering services.¹¹ As one industry observer put it, "Porsche didn't have a full-fledged, adult-rated simultaneous engineering process in place. It was still struggling to completely shed the rigid, sequential system upon which it had relied for decades."¹² Wiedeking introduced lean manufacturing and the team concepts and processes followed by industry giants Toyota, Nissan and BMW.

Part of the turnaround included the decision to extend Porsche's product line beyond the sports car niche it had dominated for many decades. As Wiedeking explained, "Our strategy is to go beyond the one-dimensional product range we have had so far."¹³ As **Figure 2** shows, Porsche's production and sales doubled in just six years as did its revenue through organic growth.

Figure 2 Porsche Sales, Production and Revenue Results (1999-2008)



Source: Porsche Annual Report.

In 2003 Porsche introduced the Cayenne, an SUV which was entering into a crowded field of competitors inhabited by Acura, Audi, BMW, Mercedes, Land Rover, Volkswagen, Volvo, Lexus, and Infiniti. The year the Cayenne was introduced, Porsche's vehicle production shot up from 50,000

¹¹ Womack, James and Daniel Jones, *Lean Thinking: Banish Waste and Create Wealth in your Corporation*, 1996, p. 192.

¹² Christopher Jensen and Don Sherman, "The Porsche Process," *Automotive Industries*, November 1, 1997.

¹³ Brandon Mitchener, "Rebounding Porsche Seeks to Shift More Output Abroad," *The Wall Street Journal Europe*, December 6, 1995.

to 75,000 units a year.¹⁴ The Cayenne, produced in collaboration with VW at VW's factory in Slovakia and which shared the same frame and doors as VW's Touareg, was derided by many as a "corruption of the brand."¹⁵ In fact the day after Porsche unveiled the first Cayenne prototype, the company's share price fell more than 4%.¹⁶ Porsche CEO Wiedeking was aware of the risk the company was taking in being so closely associated with a mass production carmaker that produced a cheaper SUV.¹⁷ It was a risk he believed would pay off down the road.

Porsche's first foray outside of its sports car market was not an immediate hit. The early version of the Cayenne was plagued with quality problems earning it the least reliable rating from *Consumer Reports* magazine. In its efforts to correct problems with the Cayenne, the company went through a cultural alignment of sorts. As one industry observer noted, "Sports car engineers didn't quite understand the demands of the many female buyers who ended up making the Cayenne their daily runabout."¹⁸ One of those demands was having the capability to unlock the Cayenne from a much further distance. Porsche key fobs were originally designed to unlock sports cars at a very close distance. Porsche went to work to fix this defect and other more serious problems, and by 2006 the Cayenne occupied the No. 1 spot in the IQS which measured buyer satisfaction in the first 90 days of ownership.¹⁹

In 2005, Porsche announced that it would be making another move outside its sports car niche. In partnership with VW, Porsche would produce a luxury sedan called the Panamera (named after a Mexican long-distance car race²⁰) which would compete against models produced by Mercedes, Aston Martin, and Audi. The Panamera was being built in a low-cost part of East Germany and was scheduled to launch in 2010.²¹

Despite the significant changes to the company's product line, Porsche's outside engineering business, PEG, remained focused on selling services based on Porsche's strength in engineering.

Outside Engineering at Porsche

Providing outside engineering services for carmakers had always been an important part of Porsche's business model. While clients owned the research that Porsche conducted on their behalf, Porsche reserved the right to use the research if the client chose not to, with the understanding that it would

¹⁴ Bret Okeson, "Engineering is Porsche's Secret Weapon," *Automotive News*, January 15, 2001.

¹⁵ Jeremy Cato, "Porsche Revs Up for Explosive Growth," *The Globe and Mail*, February 22, 2007.

¹⁶ Scott Miller, "Road More Traveled," *The Wall Street Journal*, August 21, 2002.

¹⁷ Jeffrey Fear and Carin-Isabel Knoop, "Dr. Ing. H.c. F. Porsche AG (A): True to Brand?" HBS Case No. 9-706-018, *Harvard Business School Publishing*, 2006.

¹⁸ Jeremy Cato, "Porsche Revs Up for Explosive Growth," *The Globe and Mail*, February 22, 2007.

¹⁹ Ibid.

²⁰ Stephen Power, "The Family Porsche," *The Wall Street Journal*, July 28, 2005.

²¹ Jeremy Cato, "Porsche Revs Up for Explosive Growth," *The Globe and Mail*, February 22, 2007.

not be sold to anyone else. Porsche could test or develop ideas that the company would not have been able to fund on its own.²²

For several decades VW had been Porsche's main client. In 1949, Porsche and VW signed an agreement under which Porsche was forbidden to design a car for any other company with an engine between 1.0 and 1.3 liters through 1974.²³ The formality of this agreement, however, was in dispute with others characterizing the contract as a "loose agreement" between Ferdinand Porsche and VW's chairman in which about 40% of Porsche's development capacity belonged to VW over a certain number of years.²⁴

By the 1980s Porsche was working with a variety of carmakers as well as motorcycle producer Harley Davidson. In 1991, the company founded Porsche Engineering Services Inc. based outside of Detroit, Michigan to serve the growing engineering demands of the North American market. As a wholly-owned subsidiary of Porsche AG, PES was able to work with a wide array of carmakers. As the CEO of PES explained, "We're not a competitor to automakers, due to the limited number of vehicles we produce. But we try to convince them that two OEMs working together, rather than one OEM and supporters, makes a difference. We understand the fundamentals of automaking."²⁵

In 2001, PES became the North American arm of the Porsche Engineering Group. With 400 employees, PEG was based out of Porsche's R&D center in Weissach, a town of 7,000, 23 kilometers from Porsche's sales, marketing and production activities. PEG engineers had direct access to Porsche's entire engineering team of 2,300 which was also based at Weissach. To reassure clients that their projects would remain confidential, Porsche required all visitors to sign a confidentiality agreement, making them liable if any secrets learned at the Weissach complex were revealed.²⁶ In addition, the company not only kept the names of its clients confidential, but it also disguised the vehicles tested on its private racing track.

PEG worked with virtually every auto maker in the world, with the exception of those that produced luxury sports cars, and was also involved in projects involving elevators, forklifts, earthmovers, and artificial knees.²⁷ While revenues of PEG were not disclosed in Porsche's annual report, one source indicated it accounted for 3% of turnover.²⁸

Of significant help to PEG engineers was a pool of nearly 600 graduate student interns who worked alongside Porsche's staff engineers. A budget of \$30 million was allocated to finance paid internships for the students as well as university or institute-based research studies conducted exclusively for

²² Jeff Daniels, *Porsche: The Engineering Story*, (Somerset, UK: Haynes, 2007), p. 129-131.

²³ Randy Leffingwell, *Porsche 911: Perfection by Design*, (Osceola, WI: Motorbooks, 2007), p. 68.

²⁴ Ibid.

²⁵ Gary Kobe and Lindsay Brooke, "How's Outside Engineering," *Automotive Industries*, September 1, 1994.

²⁶ Bret Okeson, "Engineering Is Porsche's Secret Weapon," *Automotive News*, January 15, 2001.

²⁷ Ibid.

²⁸ Scott Miller, "Road More Traveled," *The Wall Street Journal*, August 21, 2002.

Porsche. Porsche offered its top interns (typically about 10%) full time jobs, and those students who did not get a job offer became part of an alumni network that would be called on to provide advice on research and technology. A student intern cost 15% of what a full-time employee would cost.²⁹

Competitors and Market

The outsourcing of engineering services for carmakers was a growing industry. Some of the big players for the automotive industry included Italy's Stola and U.K.-based Hawtal Whiting and the two U.S. automotive engineering companies MSX International Inc. and Modern Engineering Inc., each of which posted revenues between \$100 and \$500 million. Lotus Engineering was the only carmaker with whom Porsche competed for outsourced engineering business.

These firms had seen their share of hard times. In the economic downturns of the early 1990s and 2000s, a lot of outsourced activities were brought in-house again. But by the mid-2000s, many of these firms had their sights set on the U.S. auto industry where demand for outsourced engineering was growing in spades due to production challenges and increased market segmentation. Between 1995 and 2005, the number of new car models produced by U.S. automakers grew 50% while the annual sales per model dropped from 100,000 to 75,000 units.³⁰ As a CEO of a U.S.-based outside engineering firm opined: "Outside engineering is a permanent change in the way business is done. There's no manufacturing business that needs to be vertically integrated anymore. It just costs too much."³¹ The CEO of PES echoed this sentiment in 2005: "We're following our customers' changes. The (automakers) have so many niche vehicles, it really compounds their resources. The downsizing and reduction of engineering means there are gaps in some engineering programs. There are opportunities for companies like us to provide that support."³² As one industry observer noted, globalization was forcing many automakers to make the difficult decision of "entrust[ing] core engineering services, and even the complete end-to-end design and development of a vehicle, to firms with the experience, expertise and sheer innovative talent to help create better products, faster and at lower cost."³³

Despite the up-tick in demand in the U.S. market, PEG sold PES to automotive supplier Magna International in 2006 for an undisclosed sum. In commenting on the transaction, a Porsche executive simply stated, "In the future, we will center all development activities for external customers in our development centre in Weissach for efficiency reasons."³⁴

²⁹ Sigvald Harryson and Peter Lorange, "Bringing the College Inside," *Harvard Business Review*, December 2005.

³⁰ Terry Kosdrosky, "Switching Gears Pays Off," *Crain's Detroit Business*, October 10, 2005.

³¹ Stuart F. Brown, "New Products From Rented Brains," *Fortune*, September 4, 2000.

³² Terry Kosdrosky, "Switching Gears Pays Off," *Crain's Detroit Business*, October 10, 2005.

³³ Warren Harris, "Engineering Services Outsourcing," *PR Newswire*, January 13, 2009.

³⁴ "Magna Buys Porsche's North American Engineering Services Unit," *Austria Today*, August 10, 2006.

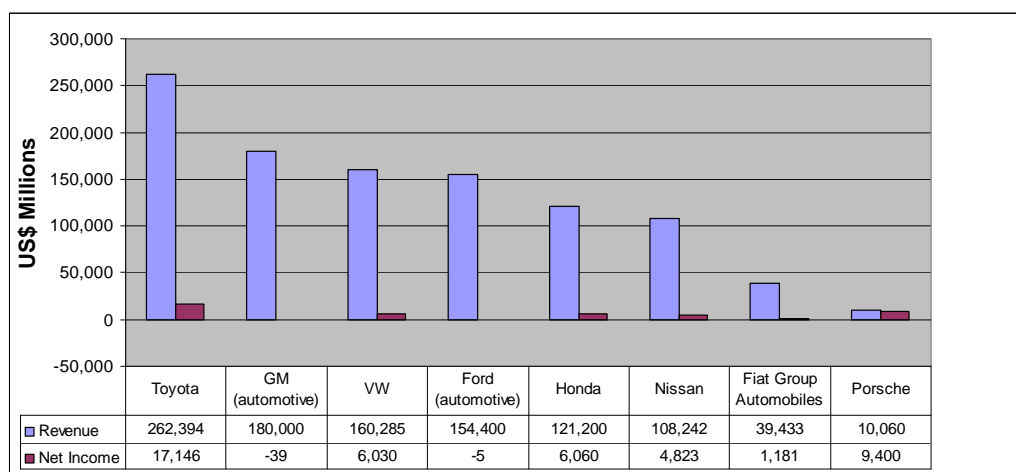
VW Takeover

Porsche made its first move towards VW in 2005 when it acquired a 20% stake igniting a rumor that its eventual takeover of VW was not an “if” but a “when.” After all, it was no secret that VW was an important partner and supplier to Porsche. In March 2007, Porsche upped its stake to 31% by paying € billion (\$6.6 billion),³⁵ an investment that was worth €16-17 billion (\$23.4 billion)³⁶ by October of that same year.³⁷

On the surface, it appeared as if Porsche and Volkswagen had little, if anything, in common. With 12,000 employees, Porsche was a small independent player in the auto industry focused on the performance sports car market. It typically sold about 100,000 cars a year at prices that ranged from \$50,000 to more than \$150,000. Historically, it had had few if any direct competitors. Other high-end sports car manufacturers like Ferrari, Maserati and Lamborghini never had the production numbers to threaten Porsche’s sales. Companies like Mercedes Benz, BMW and Audi each produced more than 10 times the number Porsche did but for a wide range of vehicles outside the sports car market.

The Volkswagen Group sold more than 6 million cars a year. With 2007 revenue topping \$160 billion (**Figure 3**) and 340,000 employees, it was the world’s fourth largest carmaker (based on units sold) with a portfolio of eight brands that included Audi, Bentley, Lamborghini, and truck manufacturer Scania, with prices ranging from \$18,000 to \$250,000. It wasn’t until the late 1990s that VW began moving up-market purchasing Rolls-Royce, and Italian sports carmakers Lamborghini and Bugatti all in one year.³⁸

Figure 3 Revenue and Net Income for Select Automakers, 2007 (US\$ millions)



Source: Annual Reports.

³⁵ € = US\$1.32 (March 1, 2007)

³⁶ € = US\$1.42 (October 1, 2007)

³⁷ Ray Hutton, “Porsche Set to Take the Wheel at VW,” *The Sunday Times*, October 14, 2007.

³⁸ Jon Ashworth, “Porsche’s New Empire,” *The Business*, March 31, 2007.

Despite their differences, VW and Porsche's histories were intimately intertwined. It was Ferdinand Porsche's engineering company that, in the 1930s, designed the first Volkswagen which later became known as the VW Beetle. A few years later, the first Porsche debuted with some of the same components used on the VW Beetle. More recently, Porsche and VW had built cars that shared platforms and components. In addition to sharing research and development, the two companies' leadership shared familial bonds. Legendary German-Austrian engineer Ferdinand Karl Piëch, the grandson of Ferdinand Porsche, was the chairman of Volkswagen's supervisory board and the Porsche and Piëch families together owned 50% of Porsche's shares and 100% of its voting stock.³⁹ Their alliance based on old family relationships allowed both companies to develop technology jointly without concern for confidentiality.

The ability to scale and create synergies across a number of areas were two driving forces that led Porsche to secure its partnership with VW. As Wiedeking explained, electronics was one area of particular interest: "Electronics account for 30% to 35% of our development costs. Spreading this investment over 2 million cars instead of Porsche's 100,000 will make a big difference and the components will be cheaper."⁴⁰ Furthermore, the capital intensity of R&D and required fixed assets in new technologies would be increasing, making it increasingly difficult for a premium-only OEM to survive unless operating in the context of a larger OEM. Forming closer ties with VW would also enable Porsche to benefit from VW's more fuel efficient technologies at a time when new emissions regulations would come into effect.

On a more macro level, by acquiring VW, Porsche was helping protect itself from the ups and downs of the auto sector. As one industry observer wrote, "A huge mainstream global car company like VW was in a better position to weather any marketplace vagaries than a luxury brand like Porsche."⁴¹

While Porsche looked at the VW takeover as a way to leverage synergies, Porsche and VW would exist as two separate companies that would sit under a new holding company called Porsche SE. (See **Exhibit 2.**)

A Repeat of Daimler-Chrysler?

While many in the industry believed that Porsche's acquisition of VW was a wise move, others expressed concern that VW would prove to be a distraction for Porsche, particularly at time when the company was about to enter another new car market with its luxury sedan the Panamera. As one industry observer wrote, "As we've seen at Daimler-Chrysler, when cultural issues are in play, the products can suffer and when the products suffer, so does everything else at a car company."⁴²

³⁹ Michael Connolly, "Porsche Tightens Grip on VW," *The Wall Street Journal*, November 15, 2006.

⁴⁰ Ray Hutton, "Porsche Set to Take the Wheel at VW," *The Sunday Times*, October 14, 2007.

⁴¹ Jeremy Cato, "Porsche Revs Up for Explosive Growth," *The Globe and Mail*, February 22, 2007.

⁴² Mark Landler, "Porsche and VW: One Happy Family?" *The New York Times*, December 23, 2007.

However, Wiedeking was adamant that the Porsche brand and culture would remain well protected: “Believe me, if you mix the Porsche guys with the Audi guys and VW guys you will have trouble. Each is proud to belong to his own company. My Porsche people are very proud of what they have achieved. They don’t want to build a bastard in the future. They want to build a Porsche.”⁴³

But whether keeping Porsche and VW as separate operations under a Porsche holding company would adequately protect the engineering and design talents that Porsche was known for was not certain. And whether the carmakers that PEG had provided services to in the past would rethink their relationship with Porsche now that it would be producing a number of competing car models was also not certain. What was certain was that Porsche was no longer a small, nimble, carmaker focused solely on the luxury sports car market. With VW now under its wing, Porsche would soon be everywhere.

⁴³ Ray Hutton, “Porsche Set to Take the Wheel at VW,” *The Sunday Times*, October 14, 2007.

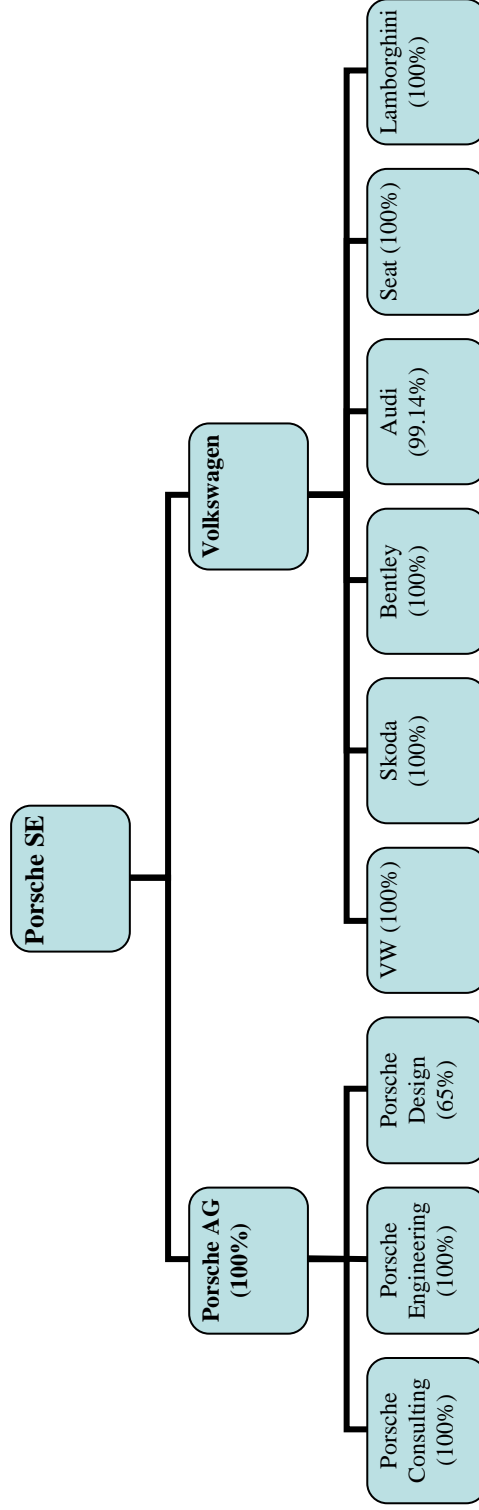
WHAT'S DRIVING PORSCHE?
Rebecca Henderson and Cate Reavis

Exhibit 1 Selected Financials for Carmakers, 2007 (revenue and net income in US\$ millions)

	Toyota	GM (automotive)	VW	Ford (automotive)	Honda	Nissan	Fiat Group Automobiles	Porsche
Revenue	262,394	180,000	160,285	154,400	121,200	108,242	39,433	10,060
Net Income	17,146	-39	6,030	-5	6,060	4,823	1,181	9,400
% on R&D	3.6	4.5	4.2	4.9	4.9	4.8	2.8	11.8
unit sales	8,900,000	9,286,000	6,191,618	6,553,000	3,652,000	3,700,000	2,233,800	98,652
# employees	299,394	266,000	329,305	246,000	179,000	180,535	50,542	12,202

Source: Annual Reports.

Exhibit 2 Porsche SE



Source: Porsche Annual Report.