

1

Introduction and Overview

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1.1 Introduction

It is an impossible task to do full justice, in one book, to the global automotive industry with the pervasive impact, economic significance and cultural status that it brings. As editors, our task is as much one of selective omission as one of collation, to create an account of the business of making, selling and using cars that is both representative and yet respectful of the diversity we know to be a feature of the industry. Moreover, this is an industry in the midst of reinventing itself. It had seemed to some both inside and outside the industry, around the turn of the millennium, that this was a ‘sunset’ industry characterized by over-capacity, plant closures, job losses, declining profitability and a product that seemed unsuited to meeting the environmental and social challenges arising from mass car ownership and use. The combination of profound environmental pressures and endemic economic distress appeared to call into question the pre-eminent position enjoyed by the car in providing for personal mobility and the viability of the industry behind this most contradictory of products. These concerns came to a peak with the arrival of the global economic crisis around 2007–2008, which resulted in new car sales falling steeply in the established markets and investment freezing while the entire financial community held its collective breath to see whether the world would plunge into an economic abyss. Those looking closely at urban developments and the changing cultural priorities of young people started to whisper about the concept of ‘peak car’ in which the high tide of automobility had been reached in the saturated markets of the European Union, North America, Japan and Korea.

Yet, only a few years later, the industry has reemerged, burnished by the embrace of new technologies and with resurgent sales in the previously moribund West being more than matched by the frenetic growth of sales in China and elsewhere. Regulatory interventions

such as the European Union fleet average carbon emissions targets that were once seen as burdensome and punitive have arguably helped stimulate the technological renaissance of the industry alongside the realization that there might be other routes to profitability. Later chapters in the book are more concerned with this recent period of transformation and the possible futures it portends: Chapter 16, for example, is about the impact of the electric vehicle, while Chapter 18 links technology change with possible innovations in business models forced on the industry by such technological changes. Chapter 19 is more speculative, but offers up some signposts for the future of automobility and the automotive industry.

This is not to say that the process of change has been without stress or consequence. Restructuring of the industry has continued apace: the merger of Chrysler and Fiat came as a consequence of several years of corporate turmoil while the rescue of PSA by the French government and by the Chinese company Dongfeng costs the Peugeot family their control over this long established business – the oldest in the industry. The great expectations held for battery electric vehicles remain as yet largely unrealized, despite the highly visible and expensive efforts of companies like Nissan, Renault and BMW alongside the publicity-garnering machine that is Tesla. In the meantime, high-profile failures such as the battery swap business Better Place serve as stark reminders that attempts to reinvent this industry, especially by new entrants, are fraught with hazard. At the same time, markets in the European Union have not really recovered to pre-crisis levels and perhaps never will.

So, despite an apparent ‘business-as-usual’ attitude permeating the automotive industry at the moment, in reality, it is subject to potentially radical change. Only a few years ago, we saw two of the world’s largest car manufacturers, General Motors and Chrysler, on the brink of collapse. Having decided both were ‘too big to fail’, they had to be bailed out by the American tax-payer. Ford managed without direct government support, but it is nevertheless quite clear that the collapse of the supply base that would have resulted from a collapse of both their key domestic competitors, GM and Chrysler, would also have dragged down Ford in due course. Within a matter of months, the world’s most prominent car industry and the oldest mass production car industry could have disappeared; only intervention from the public sector saved this key component of the private sector, underlining that, apart from anything else, the close synergies and intertwined relationships continue to exist between the private and public sectors in developed countries (Mazzucato, 2013). This highlights not only the weaknesses inherent in the close links between the financial and car systems but also indicates that the current mass production system, whether seen as Fordist or Buddhist (see below), may well be due for a rethink in several respects.

In Europe, the apparent success of Germany, more recently the UK automotive industry, is easily misunderstood, leading perhaps to overconfidence, but do note that the secret of success in Europe is largely confined to the more upmarket segments, with the Germans the primary beneficiaries, and that this success is very reliant on demand from Asia, particularly China; it has therefore made Europe – and also the United States, particularly GM – very dependent on that far from stable market, as also outlined in more detail in Chapter 10. At the same time, pressures to make the car more environmentally compatible, as we see it, have not only led to cars with much less harmful tailpipe emissions, but the more recent pressure to reduce the carbon footprint of cars, particularly focused on their emissions of the greenhouse gas carbon dioxide, has the potential to radically reshape the industry and its products. These regulatory pressures are reviewed in Chapter 14, although the potential impact of this agenda is not yet fully understood, but it has already led to a new wave of alternative powertrain vehicles in the market, ranging from early petrol-electric hybrids – including the now iconic Toyota Prius – via

so-called range-extended and plug-in hybrids such as the GM Volt and Ampera, to full battery-electric vehicles such as the Nissan Leaf, Renault Zoe and Tesla Model S. Such developments, as well as the introduction of the even more radical BMW i3, which not only introduces a full battery-electric powertrain, but also houses this within a radical departure from the tried and tested ‘Buddist’ (see Chapter 5) all-steel body in using a carbon fibre body on an aluminium chassis, are clear signs that business-as-usual is steadily being undermined even from within the established industry.

Despite the size of the industry, car making is in reality a very precarious business. In its present form, it lacks resilience; it is not sustainable. This is true not just in terms of environmental sustainability, where it clearly is not measuring up, but even in terms of basic, economic sustainability. Yet, this industry is still crucially important, representing a significant part of the economy in many industrialized countries, as well as many newly industrializing economies, notably China. In addition, the car-based transport system, or ‘regime’ (Geels et al., 2012), which extends well beyond the industry that makes cars to the way in which automobility has become integrated in our societies and cultures, has become so embedded that its removal would lead to widespread social and economic crisis.

In some regards, therefore, this book may be a testimony to a dying era as much as a hymnal to a new one. Thus far the automotive industry has managed to contain the pressures for change, both economic and environmental, within the broad ambit of the long-standing business model of the mainstream vehicle manufacturers. In parallel, those purchasing and using cars in the traditional manner have remained by far the majority compared with more innovative solutions such as car clubs, city car sharing schemes and other alternatives that might presage the end of established automobility cultures. The question is whether the collective and cumulative impact of all the new developments sweeping through the industry will be sufficient to herald the arrival of a new ‘automotive ecosystem’ as some have termed it, or ‘regime’, according to others, and one in which the dominance of the established vehicle manufacturers and their entrenched supply chains is challenged by a new order of communications and mobility providers. Some caution on these issues is urged here. The automotive industry is not immune to hype cycles or the fevered imaginations of those professional change-mongers with a vested interest in fermenting and emphasizing the new over the continuous.

1.2 Continuity and Change

The book as a whole therefore represents an attempt to capture continuity and change in the global automotive industry; this theme is brought to the fore in the first main chapter of the book, Chapter 2, as change is very much a feature of the current phase of the automotive system. Change of course needs to be seen in historical perspective and as such, many of the chapters offer up a historical narrative that builds a temporal dynamic into the account of the subject under consideration. There is some need, in seeking to understand the structures and practices of the present, to delve into the past. If nothing else, path dependency theory tells us that many decisions are nonlinear, irreversible steps that result in distinct historical outcomes bounded by time and place. As we have sought to delineate elsewhere, the cluster of innovations that created the template for the mass production automotive industry occurred largely in the United States in the early years of the twentieth century: the Ford moving assembly line with standardized and inter-changeable parts; the Budd all-steel body that could be stamped,

welded and painted and the Sloan multi-brand company with marketing innovations such as consumer credit and annual model changes; these developments are outlined in Chapter 5. Despite many years of incremental change, the basic architecture of the industry remains in place. That such durability is evident speaks volumes for the scope for productivity improvement within this basic architecture over many decades and the efficacy of the system as a whole in terms of matching the imperatives of production economics to the demands of the market. For this reason, key early chapters in the book, for example Chapters 3, 4, 5 and 6, are about the production system and the market for cars. There is no subscription here to the simple neoclassical economics assumption that ‘consumers’ demand and ‘producers’ provide. Rather, there is a continuing dynamic tension between supply and demand sides that is never entirely resolved.

1.3 Overview

The chapters in this book are thus essentially an attempt to take stock of the industry in its present state of a well-established industry on the verge of potentially radical change, tracking some of its history – trying to answer the question of how did we get here – assessing key aspects of its current state, while also plotting some possible futures for the industry and its products. This book does not seek to present chapters that are held together by a common theoretical thread. Such works can be tremendously informative and insightful (see Geels et al., 2012), but of course tend to place primary emphasis on the question of theoretical coherence. Rather, the approach here has been more agnostic in theoretical terms and has been to seek insights and individual views by those who are established experts in their fields and who are known for their knowledge of the automotive industry (or a specific aspect of it) alongside their particular theoretical or methodological frameworks. Each chapter is thus a cameo, able to stand alone as a concise insight into one dimension of this multi-faceted industry but also serves as a piece in the jigsaw that describes and explains how this industry really works.

There are some gaps of course. It is not possible to give consideration to all the countries producing cars and the unique contexts within which they operate. The salience of the ‘varieties of capitalism’ school of thought (see Section 2.3) is acknowledged here and some comparative chapters are pertinent to this school: notably those on labour–management relations in North America and Japan (Chapters 7 and 8, respectively). While the question of labour relations in Japan has remained largely immune to external influence (notwithstanding the substantial impact of Renault on operations at Nissan and the rather lesser impact of Ford on Mazda), the story in North America has a strong thread in which ‘Japanization’ has been highly significant. Chapters 9, 10 and 11 cover the broad sweep of the automotive industry in Asia, highlighting South Korea, China and India respectively – both Korea and India have become comparatively neglected in view of the immense attention directed at China. Interestingly, both these countries are more than passive recipients of automobility and can claim to be home to significant companies within the industry of the modern era, while also representing unique markets.

An apparent gap in the account includes a chapter that explicitly deals with the global supply chain of components and raw materials to the vehicle manufacturers – where typically up to 85% of the ex-works value of a new car is accounted for by bought in components and materials. The theme of supply chain management is an important facet of the industry but

is not given a distinct treatment in this book, although aspects of it are covered in a number of chapters. Indeed, a more 'functional' approach to the industry could include themes such as marketing and branding, inbound and outbound logistics, vehicle finance, production management, R&D, government affairs, human resource management, leadership, trade and currency risk management, reverse logistics, service and maintenance, end-of-life vehicle management and much more. Inevitably, aspects of these functional typologies do in any case appear to a greater or lesser extent in the chapters, but the book is deliberately not designed around them.

On the car supply side, the automotive manufacturing industry itself, the debate has long been dominated by issues surrounding the organization of labour and this is reflected in Chapters 7 and 8 in particular, which highlight the traditional mass production, or 'Fordist', or 'American System'-based approach, while contrasting this with the different Japanese approach, as developed under the Toyota Production System, now also known as 'lean' production. Both chapters also highlight how in recent years the two approaches have increasingly influenced each other, a theme also touched upon in Chapter 5. Chapters 6 and 9 take a more mixed approach, with the former reporting on and analysing recent trends in mass manufacturing in various locations around the world and the implication of these on the organization of labour. Chapter 9, while still involving discussion of the organization of labour in a mass production system, also proposes the role of other factors in the rapid growth of the Korean car industry, something also reflected in Chapter 11 on India. The other feature of the supply-side story is the role of technology; it was technology after all that enabled the development of mass production, which then prompted a rethink on the organization of labour used to interface with that technology. This is the dominant theme of Chapter 5, which recaps previous work on the technological history of mass production, as pioneered by Edward Budd and links this with recent advances in 'lean thinking'.

The demand-side story is interwoven with the above chapters, as in truth supply and demand are closely linked. This side of the automobility system is first covered in Chapter 3, which deals with markets, while Chapter 4 analyses the crucial psychology of automobility in all its different aspects – how do people make decisions about their transport needs? Chapter 12, then, covers the interface between supply and demand more specifically: the crucial retail and distribution system, which is tightly linked in with the way cars are mass produced today, being tasked with resolving many of the issues that arise from the requirement, outlined above, to reconcile the needs of the mass production system for standardization, with the needs and wants of the market for increasing differentiation. The three chapters that follow then consider wider aspects of the automobility system. Thus, Chapter 13 provides an account of the various negative impacts of the industry, particularly in the areas of occupant safety and toxic emissions; Chapter 14 examines how such impacts have been ameliorated through regulation, while Chapter 15 considers the bigger picture of the role of the industry in the world, the ongoing globalization process and the resulting impacts on economies both global and local.

The final four chapters, then, consider the future, which in product terms is likely to witness an increasing adoption of electric powertrain vehicles of various types, ranging from simple petrol-electric hybrids and diesel-electric hybrids, via plug-in and range-extended hybrids to battery-electric and fuel cell cars. These are discussed in Chapter 16, while Chapter 17 reviews various possible alternatives to the car and the current car system. Chapter 18 then discusses the need for new technology and use configurations to be delivered through new business models that may be rather different from those that both industry and end user have become

familiar with over the past 100 years or so. The final chapter then considers the state of the industry and its future prospects in the light of what has been covered in the other chapters.

The story of the car industry and the automobility system it has allowed to be created is a compelling one. However, many fundamental aspects of both are likely to come under increasing pressure in the very near future. An overview of the industry and the socio-technical regime that underpins it is therefore timely. This book contains insights by experienced and in many cases world-renowned experts in the industry in its various aspects, thereby presenting a real state of the art of the industry today, its explanation in the past and prospects for its future.

References

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