

## *Introduction*

Automobile industries have historically played an important role as case studies in understanding the success and failure of economic development. Countries that have attempted to build a national automobile industry have often chosen to do so as part of a larger project of promoting modernity through industrial development and the accrued benefits of long-term economic growth. In the automobile industry, these benefits include backward linkages to automotive parts suppliers who in turn support the plastics, rubber, and steel industries. Since automobiles are expensive, when exported abroad they provide a country with capital. Automobiles also transform society through the implementation of new manufacturing techniques (Kronish & Mericle, 1984; Biggart & Guillen, 1999). It has recently been estimated by the International Labor Organization that in 2004, 8.4 million people across the globe worked in automobile production.<sup>1</sup>

In the post–World War II era, many countries in the global south have attempted to take advantage of the economic benefits of automobile manufacturing by developing a local automobile industry with national brands. Only Japan and South Korea have been successful in this endeavor.<sup>2</sup> Since the 1980s, China, Malaysia, and India have attempted to emulate their success. An unlikely, and surprisingly successful, addition to the group is Iran, which in 2011 successfully produced 1.4 million vehicles a year and became the world’s eleventh-largest producer of passenger cars, the fourth largest in the global south, and the largest in the Middle East.<sup>3</sup> Thousands of research and development engineers currently design national vehicles, while approximately 400 tier-one parts suppliers produce 70 percent of the local manufacturing content.

<sup>1</sup> [www.ilo.org/wow/Articles/lang-en/WCMS\\_115469/index.htm](http://www.ilo.org/wow/Articles/lang-en/WCMS_115469/index.htm). This does not include the jobs related to the sales and service of automobiles.

<sup>2</sup> Countries that have not succeeded include Indonesia, Thailand, the Philippines, Mexico, Brazil, Peru, Argentina, and Turkey.

<sup>3</sup> <http://oica.net/category/production-statistics>.

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With \$20 billion in revenues and an average annual growth rate of 29 percent since 2000, the automobile industry is the second-largest industry in Iran outside of oil.

This book focuses on the post-revolution success of the Iranian automobile industry. Despite enjoying a near monopoly and various subsidies, it stands out as the only industry in Iran where large enterprises have well-developed backward linkages to small and medium-sized enterprises (UNIDO, 2003). These linkages have created an industry that is Iran's largest source of employment (currently, over 100,000 direct employees and 500,000 to 1 million indirect employees).<sup>4</sup> Furthermore, it has been relatively successful on international markets – exporting over \$500 million worth of completely built-up automobiles and parts to regional markets in 2011.<sup>5</sup> The post-revolutionary rise of the industry offers stark contrast to its less successful earlier performance: despite 15 years of development under the Shah, the Iranian auto industry by 1979 had only a low volume of assembly operations.

Given the commonly cited requisites for the development of a successful auto industry, Iran should not have been able to develop one. A remarkable characteristic of automobile industrial development in Iran is that it accomplished its goal of building a national industry despite decades of US economic sanctions and isolation from global economic institutions. According to the Economist Intelligence Unit, of sixty nations surveyed Iran was ranked fifty-ninth in overall openness to the world economy (Amuzegar, 2005). Iran is not a member of the World Trade Organization or the World Bank and has not allowed direct foreign investment to influence industrial strategy.<sup>6</sup> This book will show how there are more ways to tap into global linkages to build an industry than the conventional policy of conformity to global institutions, and it does so in a very interesting way with general implications about the role of engineering consultancies in building indigenous technical capacity. In this way, it is a novel contribution to the network-centered development literature that argues globalization has created new opportunities for industrial development (O'Riain, 2004; Wong, 2005; Whitford & Potter, 2007; Block, 2008; Breznitz & Murphree, 2011; Schrank & Whitford, 2011).

<sup>4</sup> Iran Statistical Yearbook (2005–2006), Statistical Center of Iran.

<sup>5</sup> Besides oil, rugs, and pistachios, the automobile and the related machine tool industries are Iran's largest exporters. The automobile industry has close to ten times the export revenue of the electronics industry. From World Trade Organization: [www.wto.org/english/res\\_e/statis\\_e/statis\\_e.htm](http://www.wto.org/english/res_e/statis_e/statis_e.htm).

<sup>6</sup> Since the revolution, the amount of FDI entering Iran has been low compared to that of other developing countries. In 2000, the amount of FDI in Iran amounted to US \$1.35 per capita compared to \$12 in Turkey, \$31 in China, and \$68 in Malaysia. (From *Strategy Document to Enhance the Contribution of an Efficient and Competitive Small- and Medium-Sized Enterprise Sector in Iran*, United Nations Industrial Development Organization, February 2003, p. xxiv.)

In addition, the broad consensus within the sociology of development literature is that states shape development. Scholars argue that state structures have important implications for positive development outcomes and, more broadly, for economic growth and social provision. They further argue that successful development requires high state capacity, whereby development agencies are autonomous but embedded in society to coordinate development activities (Evans, 1995; Kohli, 2004; Chibber, 2006). The scholarship analyzing Iran's economic development since the revolution, however, portrays a negative view of Iran's state capacity. It is argued that political factionalism in post-revolutionary Iran has led to entrenched, institutionalized disagreements about which economic policies are best to adopt (Siavoshi, 1992; Baktiari, 1996; Moslem, 2002). Factionalism has resulted in a diminution of state autonomy, resulting in incoherent economic planning that in turn has led to industrial and agricultural decline (Amirahmadi, 1990; Schirazi, 1993; Amuzegar, 1997b). Islamic institutions and foundations that own large industrial organizations are implicated in transforming Iran into a rent-seeking predatory state (Maloney, 2000; Saeidi, 2004). Furthermore, self-interested actors in government bureaucracies have created import monopolies undermining local industrial development (Keshavarzian, 2009).

Economic dependence on resource-based exports should have further undermined the capacity of the state to develop an automobile industry (Karl, 1997). Instead of creating an economy that is accountable through taxation, oil-rich countries rely on oil as the primary resource for state revenues. This resource dependency has a large impact on a state's institutional development and its ability to direct the activities of private interests. The state – and not the private sector – becomes the center of accumulation, and hence institutions are structured around state actors who live off the teat of oil revenue. This arrangement leads to the hyper-control of development through high rates of patrimony and centralization, and industries eventually fail due to inefficiencies and incompetence.<sup>7</sup>

The influence of Islamic laws and institutions on industrial development should also have undermined Iran's ability to develop an automobile industry. In clerical establishments, typically characterized by traditional authority and age-old principles, appointments of staff members into positions of power are based on patrimony over merit (Weber, 2013). In addition, Islamic states tend to have “despotic” regimes that undermine protection of property rights and embrace laws that diminish the ease of opening private businesses to support economic development (La Porta,

<sup>7</sup> Karl's analysis should be distinguished from more strictly economic theories of “Dutch disease,” a process in which export revenues distort prices in such a way as to discourage industrialization and agricultural development.

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Lopez-de-Salinas, Shleifer, & Vishny, 1998, 1999). We would therefore expect that a modern industrial development project in an Islamic state would fail.

The anomaly of Iran's automobile industry raises a number of important questions as to why Iran, a country with many factors that should impede industrial development, stands out as one of the few countries in the postwar era to develop a large automobile industry with national brands and indigenous technical capacity. Where did the state capacity come from for automobile industrial development? What roles did agency and the stabilization of the political and industrial fields play in transforming institutions to open up space for development? In the face of its isolation from formal global institutions and further exacerbated by US sanctions, how did Iran obtain the technology to develop an industry with domestic technical capacity? Why didn't the dominant political role of the clerics and the "resource curse" undercut the ability to construct an industry?

In this book, I will show that insulation of the Iranian automobile industry from a key set of organizations and from other parts of the state apparatus created a successful "mini-developmental state" for the automotive sector. I will also contend that origins of state capacity were contingent upon key actors constructing a network of politically effective relationships at key historical time periods to push forward a nationalist agenda. The Iranian auto industry, however, operates at the intersection of two fields: the political field and the industrial field. Institutions and strategic actors operating at this intersection were key to both constraining and making possible the necessary autonomy for successful industrial development. Once industry autonomy was established, the industrialists established infant industry protection. Then, despite isolation from formal global institutions and capital as well as the presence of US sanctions, they were able to tap into a set of important global linkages with engineering consulting firms, parts suppliers, and peripheral multinational automobile producers – all of which created an industry with high local manufacturing content. The engineering consulting firms, whose role goes largely unrecognized in the scholarly literature, were particularly important in transferring the necessary knowledge and technology to Iran so that industrialists could develop national brands with indigenous local capacity.

This book will make three major contributions to the industrial development and globalization literature. First, it will build on a subset of state capacity literature that studies intermediate states, which have a state apparatus that exists on the continuum between the predatory and developmental ideals. More specifically, it will argue that developing countries can achieve successful development outcomes by carving out a "pocket of efficiency" within a larger state apparatus that is otherwise not conducive

to successful industrial development (Geddes, 1990; Cheng, Haggard, & Kang, 1998; Evans, 1998; Hout, 2007; Hertog, 2010). According to these studies, a pocket of efficiency is created largely through a top-down approach: a ranking state actor creates and protects the development organization from social groups seeking to undermine it for their own gain. Considering that scholarship, this research takes a different approach. Building on the social field and balance of power literature (Waldner, 1999; Moore, 2001; Khan, 2004; Doner, Ritchie, & Slater, 2005; Slater, 2010; Saylor, 2012; Hau, 2013) it shows that the construction of a pocket of efficiency in a politically fractious state relies on a higher degree of *agency* by mid-level industrialists to create and sustain a coalition to support industrialization.

The second contribution is the concept of sequencing. The dynamics of how states evolve through different levels of efficiency is not well studied. The importance of sequencing is much easier to understand when focusing on a sector rather than the evolution of the state as a whole. The sequence of constructing a “pocket of efficiency” in Iran’s auto industry was a dynamic process: causality went from conflicts between industrial-nationalists and neoliberals and the left, to elite business-state alliances, to a pocket of efficiency lodged in the development agencies. My analysis of this process builds on the idea that a stable political field and elite coherence are important for building state capacity; it differs from studies emphasizing top-down processes by showing how pockets of efficiency can be formed through a middle-up lobbying process. I will argue, however, that a pocket of efficiency is fragile because a development agency’s autonomy is directly related to state officials’ ability to support and maintain the agency, protecting it from strong outside social forces that oppose or undermine development over time (Geddes, 1990; Evans, 1998). This shifts the focus away from associating state capacity with type of state (weak or strong, predatory or developmentalist) to an evolving sequence of developing agencies on the part of social groups with a shared agenda and the resources to realize it.

Third, this book will build on recent network-centered development theories arguing that the reconfiguration of industrial production has created new opportunities for industrial development (Gereffi & Korzeniewicz, 1994; O’Riain, 2004; Whittaker, Zhu, Sturgeon, Tsai, & Okita, 2010; Block & Keller, 2011; Breznitz & Murphree, 2011; Keller & Block, 2012). By building on current theories, it will introduce engineering consulting firms as important global network actors in transferring technology for the development of an automobile industry. The concept of global technology “networks” is important because local ties to engineering consulting firms enable countries to develop automobile industries with greater local indigenous technical capacity and to

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design and produce products with a greater degree of independence and autonomy from global automobile assemblers.

The role of engineering consulting firms in national automobile industrial development offers a completely different model, compared to more standard works on the auto industry, which privilege relations between global firms that dominate the end market for final products and national industries in less developed countries (Kronish & Mericle, 1984; Jenkins, 1987; Doner, 1991; D'Costa, 1995; Harwit, 1995; Biggart & Guillen, 1999; Thun, 2006).

This model, therefore, has a number of important implications for industrial development. First, despite the inability or denial of some national efforts to comply with political rules governing global economic relations instituted under the neoliberal order, there is still space for less developed countries to access technology via global corporate networks. This contradicts studies claiming that neoliberalism undermines national industrial development (Chang, 2002; Wade, 2003). Second, despite a country's isolation from global institutions and centers of economic power (i.e., the United States), it can still develop an industry with high technology if it establishes ties to engineering consultancies. Third, global corporate networks should not be treated as homogeneous. Different sorts of global corporate networks have very different properties and very different implications for national industrial development. Last, the positive potential for networks building around control of technology, without control of capacity, to compete in final product markets has been insufficiently acknowledged in the existing literature.

The arguments proposed in this book require theorizing to explain how state capacity was established in a politically fractious, incoherent state apparatus with predatory tendencies. The theoretical frame will include an explanation of social and institutional changes leading to the formation of state capacity. In addition, the theory will explain how, in the current globally integrated economy, isolated countries can construct a strategy to transfer the technology required to build an industry with high local technical capacity. The following sections will review the sociology of development literature and current institutional theory applicable to the case of the Iranian automobile industry as well as provide a brief explanation of the book's findings and arguments.

### State of the Literature

#### The Global Reconfiguration of Industrial Production

The postwar development of automobile industries was associated with a late development strategy whereby developing countries absorbed knowledge and technology created in already developed countries.

Development strategy incorporated a step-by-step process of industrial upgrading: from assembly operations, to the manufacturing of vehicle parts, and finally the creation of research and design laboratories. One advantage of late development was the ability to borrow or license technology from the “technological shelf” created by already developed countries (Gerschenkron, 1962; Amsden, 1989; Whittaker et al., 2010). During the manufacturing stage developing countries could rely on reverse engineering to deepen technical capacity, taking advantage of developed countries being more lax in the enforcement of intellectual property rights (Kim, 2004). Manufacturing enterprises were vertically integrated, and the large manufacturing companies owned or tightly controlled their parts suppliers. If a developing country therefore established a tie to one or more large vehicle manufacturers, it could obtain the assembly and parts technology to manufacture vehicles.

Some scholars posit that the global reconfiguration of industrial production and rapid innovation have undermined late development strategies (Breznitz, 2007; Whittaker et al., 2010; Breznitz & Murphree, 2011). Industrial reconfiguration is associated with two major changes in global production – industrial “fragmentation” and the rise of global value chains (Gereffi & Korzeniewicz, 1994; Arndt & Kierzkowski, 2001; Sturgeon, 2002; Whitford & Potter, 2007; Sturgeon, Biesebroek, & Gereffi, 2008). Industrial fragmentation began with the outsourcing movement of the 1990s when the large manufacturers spun off their parts supplier companies. The outsourcing strategies allowed parts suppliers to establish independent supplier relationships outside their traditional assembler-supplier network. In addition to this policy change, large automobile companies expanded into emerging markets in the 1990s – outsourcing the production of parts to a supply chain in regions where they had established assembly operations. These new policies delinked innovation, design, and marketing from production and thus created large, independent global parts suppliers with increased scope and scale of operations.

Along with the increase in fragmentation, the automobile industry is now a globally integrated industry where modular components and parts, made in several worldwide locations, are produced and supplied by global automobile parts suppliers to the lead automobile assemblers. The rise of global value chains has resulted in a given country’s ability to develop a niche in design or production of automobile components at a particular stage in production – and to market those components via a global supply chain.

Rapid innovation has also undermined late development strategies. Highly integrated advanced electronics have replaced many of the simpler mechanical components in most contemporary vehicles. The most important of these new technologies are in advanced engine design and

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electronic control units that are key components in meeting stricter global environmental standards. These changes have weakened the ability for developing countries to rely on reverse engineering to develop local technical capacity during the early stages of product development (Block, 2008).

A less well understood impact of the reconfiguration of industrial production is that it has opened up a space for engineering consulting firms to play a critical role as key network actors to assist in building greater local, indigenous technical capacity for automobile industrial development. Engineering consulting firms achieve two goals. First, they transfer higher, value-added technology and knowledge as well as their own intellectual property rights to local firms. In this way, developing countries can move up the automobile global value chain by acquiring rapidly innovating technology without the need to depend on multinational automobile assemblers. Second, consulting firms use their own network of ties to global parts suppliers to help developing countries create local industries with independent, national brands. This is accomplished when they link local parts suppliers to a network of global parts suppliers to license and manufacture parts locally.

Many of the most prominent engineering consulting firms were founded prior to the mid-twentieth century. Their core business through the 1980s existed mainly among large automobile assemblers in Europe and America. Starting in the early 1990s, the firms began to expand their client base when automobile companies started to outsource their engineering research and design work (Turner, 1996; Robinson, 1998). This policy increased the engineering knowledge and technical capacity of the firms, making them more important players as “knowledge and technology brokers” (Bessant & Rush, 1995; Hargadon & Sutton, 1997). The engineering consulting firms are now multinational corporations with offices in Europe and the United States and in developing countries that are active in developing national automobile brands. Technology transfer through engineering consultancies is most important for isolated countries, such as Iran, that do not have as much access to conventional technology as countries that are more globally integrated.

The reconfiguration of industrial production, therefore, has created new opportunities for industrial development not available to countries prior to globalization. Countries, however, need to engage in a network-centered strategy whereby they establish links to multiple actors. These actors include ties to multinational assemblers of finished automobiles, multinational parts suppliers, and – if they are developing national brands – engineering consulting firms. The industrialization process in the current global economy, however, requires a state to have sufficient capacity to coordinate industrial activities. The next section will discuss



the role of state capacity and how it has changed due to the reconfiguration of industrial production.

### Developmental and Neo-Developmental State Theory

Since the 1980s, the coordination of successful industrial development has been attributed to the concept of the developmental state (Johnson, 1982; Wade, 2004). A prominent subset of the development state scholarship is the work on state capacity. According to state capacity theorists, states can be divided into two ideal types: developmental states that enable industrial development and predatory states that undermine development (Evans, 1995; Kohli, 2004). Developmental states tend to have coherent Weberian bureaucracies that are autonomous but embedded within society. Autonomous bureaucracies allow state actors to implement a development project without political influence or capture from social groups or classes. They are characterized by individuals driven by collective goals and tied to state agencies as well as their constituents. A bureaucracy's *esprit de corps* allows it to transcend individual interests in order to achieve national goals, and its embeddedness allows the state to negotiate goals, monitor activities, and receive feedback to ensure the success of a development project. An important point here is that states that are high in "state autonomy" are more likely to form the embedded autonomy structure that leads to positive development outcomes. In predatory states, state autonomy is low – so development does not take hold because individual incumbents are allowed to pursue their own goals and ties to society are forged through individuals or social groups who divert a development project's resources to themselves and their constituents.

The study of state capacity offers scholars a predictive model for the success or failure of automobile industrial development. What would this development look like in the two extremes of state capacity? In ideal-typical developmental states, the bureaucracy functions as a nodal agency to coordinate and maintain coherent industrial policies leading to the development of successful industries (Johnson, 1982; Amsden, 1989; Wade, 2004; Chibber, 2006). In these states, the industrial development bureaucracies, the industrial elite, and the state are in agreement regarding which development policies to implement. Important development state policies include protection of domestic industries through high tariffs on foreign imports, guiding investments into priority sectors, and promotion of joint public/private research organizations to build indigenous technical capacity. Our understanding of state capacity would predict that an automobile industrial development project in a predatory state would be doomed to failure. State actors in government agencies would plunder the finances allotted for the industry for personal gain.

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Recent scholarship on state capacity adds important insights into the factors leading to coherent policies in developmental states. Chibber (2002, 2006) argues that states with autonomous development bureaucracies embedded within society will not sufficiently achieve successful industrial development. Instead, development organizations must have significant “institutional power” to discipline agencies within the state apparatus to develop coherent industrial policies. A strong nodal organization leads to a growth-oriented alliance between state and capital. He argues that if a capitalist business class significantly weakens the power of the “nodal” development bureaucracy, a country will not have the capacity to become a developmental state. For instance, lack of institutional power of India’s Planning Commission industrial agency was predicated on the presence of strong business associations that undermined its autonomy. Due to various domestic and external factors, this capitalist check on autonomy was more or less absent in Korea. Kohli (2004) makes a similar claim but emphasizes the role of a strong executive branch that uses economic nationalism as a tool to exhort social groups to engage in economic advancement.

Most states, however, are not ideal-typical predatory or developmental states. Many can be considered “intermediate” because they exist on a continuum between the two ideal types. Evans originally argued that when these states engage in industrial development, the lack of a proper balance between autonomy and embeddedness will result in mixed industrial development outcomes. For instance, states with weakly embedded autonomous bureaucracies will not receive adequate feedback from business elites on how to correct policy mistakes. States without rational bureaucracies will fail due to close patrimonial ties to business elites who will create a rent-seeking industrial apparatus (Evans, 1995; Wright, 1996).

Subsequent studies, however, show that industrial development can succeed in intermediate states – or, in more extreme cases, where the state apparatus is dominated by predatory behavior. These states have industries where key actors in the state apparatus have carved out an “island” or pocket of bureaucratic efficiency (Geddes, 1990; Cheng et al., 1998; Evans, 1998). A pocket of efficiency refers to a development bureaucracy intentionally created to be independent of state bureaucratic control; hence it is insulated from clientelistic pressures within the state apparatus and social groups that can undermine industrial development. This arrangement allows development agencies or firms to control their own financial and human resources, thereby leading to a greater probability of achieving successful industrial development. A pocket of efficiency, however, is fragile because a development agency’s autonomy is directly related to state officials’ ability to support and maintain the