Institutional Frameworks and Economic Performance in the French Defense Industry

Eine Abschlussarbeit zum Erreichen des akademischen Grades
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Abstract:

This thesis analyzes how institutional frameworks impact relative economic performance in the French defense industry. Applying a theory-testing variant of process tracing and drawing on the debate by scholars of comparative political economy on changing institutions in the French post-war dirigste model, this thesis challenges the notion of the French capitalist model as an outdated production system. It is claimed that, albeit somewhat transformed, the French defense industry has kept many traits that once were so characteristic to the post-war French model – and thrives precisely because of that.

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APE	Agence des Participations de l'État
BDSV	Bundesverband der deutschen Sicherheits- und Verteidigungsindustrie e.V.
CNRS	Centre National de la Recherche Scientifique
CME	Coordinated Market Economy
CRI	Crédit Impôt Recherche
CSDP	Common Security and Defence Policy
DAS	Direction des Affaires Stratégiques
DCAN	Direction des Constructions et Armes Navales
DCI	Défense Conseil Internationale
DCNS	Direction des Constructions Navales
DERA	Defence Evaluation and Research Agency
DESO	Defence Export Service Organisation
DE&S	Defence Equipment and Support
DGA	Délégation Générale de l'Armement
DGA/DI	Délégation Générale de l'Armement-Dévéloppement International
DGA/SMQ	Délégation Générale de l'Armement-Service centrale de Modernisation et Qualité
DMA	Délégation Ministérielle pour l'Armement
DTIB	Defense Technological and Industrial Base
EC	European Commission
ECJ	European Court of Justice

EEAS	European External Action Service
ENA	École Nationale d'Administration
EDA	European Defence Agency
EADS	European Aeronautic Defence and Space Company
EU	European Union
GMW	Gruppe Wehrtechnische Messen
LME	Liberal Market Economy
KfW	Kreditanstalt für Wiederaufbau
KMW	Krauss-Maffei Wegmann
MIC	Military Industrial Complex
NAM	Non-Aligned Movement
OCCAR	Organisation Conjointe de Coopération en Matière d'Armement
ONERA	L'Office National d'Études et de Recherches Aérospatiales
R&D	Research and Development
PPP	Public-Private Partnership
SNECMA	Société Nationale d'Étude et de Construction de Moteurs d'Aviation
SNPE	Société Nationale des Poudres et des Explosifs
SGP	Stability and Growth Pact
SMEs	Small and Medium-sized Enterprises
TFEU	Treaty on the Functioning of the European Union
TKMS	Thyssen Krupp Marine Systems
UK	United Kingdom
VoC	Varieties of Capitalism

1 Introduction

Today, after almost ten years of recession, the French economy is in a state of agony; unemployment is high, private and public debts are high and the political system is in an existential crisis. Moreover, industrial production is at a post-war trough and the current account deficit keeps growing. However, contrary to these general trends, the French defense industry has consistently shown steady growth: Year after year, turnover in the defense industry increases steadily, employment is back on the rise and defense contractors bring in one large export contract after the other. At the same time, both the French economy in general and the French defense industry in particular have seen decades of deep institutional transformation – albeit with different results: since the early 1980s, in light of deep economic challenges, French governments of different political colors have profoundly reformed French political and economic institutions (Schmidt, 1996). Starting roughly one decade later, the defense industry went through a period of deep reforms as well, albeit with similarities and differences.

Concurrently, the defense industry sits at a peculiar place within political economies in general and the French economy in particular. As is the case in most countries, few issues are more vital to the French state than providing security and defense. Other than organizing and commanding a powerful military, states (and particularly the French state) seek to guarantee reliable procurement of armament and weaponry. Domestic defense industries as the natural suppliers of these goods have origins that often go back centuries, significantly pre-dating national industrialization periods. Furthermore, defense industries have been historically located at the core of industrial production systems as they were often highly regulated by the state and made up considerable parts of domestic (industrial) production. Consequently – yet surprisingly so – defense industries in capitalist economies today resemble largely the overall structure of the national production system (Mölling, 2015). Furthermore, the production of defense equipment and the regulation of defense industries are repeatedly subjects of a highly controversial debate on state-industry relations and lobbying in the defense industry – often sparked by reports showing high arms export figures. In summary, defense industries traditionally inhibit a singular place in national production systems despite being embedded in an equally changing overall political economy.

However, defense industries today are largely understudied from a comparative political

economy perspective. Many scholars refrain from studying an economic sector, that is considered so highly politicized and controversial and where access to data is scarce. On the other hand, in some cases, defense industries account for a considerable part of domestic industrial production and political-economic institutional frameworks are deeply influenced by the defense-industrial sector, which make defense industries an interesting subject of study. This is particularly true in France, combined with a surprisingly good economic performance.

Therefore, this thesis challenges the widely established notion that the French capitalist model is an outdated industrial production system. Building on literature from comparative political economy, we will argue that, albeit somewhat influenced by the liberal Anglo-Saxon model, the French defense industry has kept many traits that were once so distinctive of the French dirigiste model and thrives precisely because of that. What is more, it will be shown that political actors are capable of shaping socioeconomic institutions against what is widely perceived as an irresistible pressure from globalization, as suggested by Ohmae (1995). This is not to say that institutional frameworks in the French defense industry were not transformed at all or that globalization has not exerted pressure on these institutional frameworks.

This thesis is organized as follows: The first chapter continues by developing the research question and the arguments behind the claim that institutional changes over the past two and a half decades have contributed to the strong economic performance of the French defense industry. Additionally, a literature review will be presented. The second chapter starts by discussing possible explanatory accounts for the good economic performance of the French defense industry, followed by a presentation of the typology of the French political economy as a model for "state-enhanced capitalism" (Schmidt, 2003). From this typology, predictions for the direction of institutional change within the defense industry will be developed so that these predictions can be tested against the empirical findings in the third chapter. Subsequently, the methodology of this thesis will be presented, followed by a clear cut definition of what is meant when referring to the French defense industry. The third chapter begins by briefly presenting the historical development of the French defense industry in order to lay the ground for the subsequent analysis of the major structural changes that have taken place over the past two and a half decades. Subsequently, (1) the changing role of the French procurement agency *Délégation Générale de l'Armement* (DGA) will be presented, followed by analyses of (2) changing ownership patterns, (3) the financing and research & development system, and (4) the French system of promotion of arms exports. In order to illustrate the evolving institutional frameworks in the French defense industry, crucial points of institutional change will be identified and analyzed, before

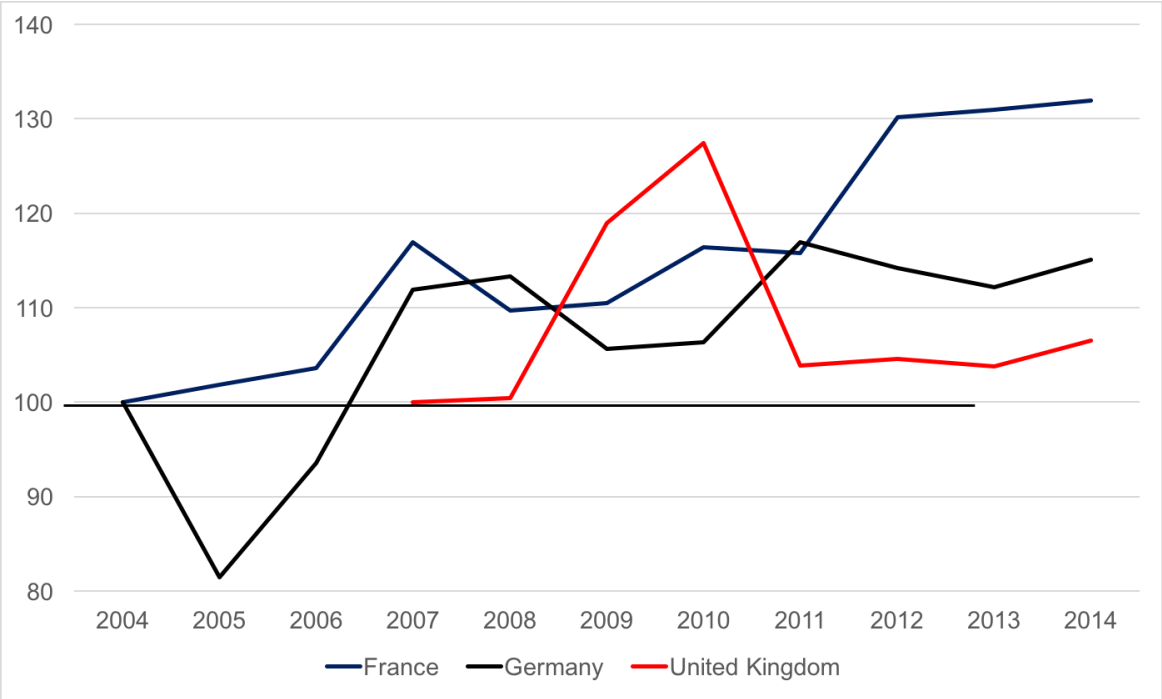
applying a cross-country comparison. With each chapter, the ramifications of the evolution of the institutional frameworks within the defense industry for the performance of the French defense industry will be discussed. The final chapter starts by revisiting the findings of the previous sections. By assessing the validity of the predictions formulated in the second chapter, the overall ramifications of the evolution of the institutional frameworks in the French defense industry for Schmidt's typology of the French variety of capitalism will be discussed.

1.1 Research Puzzle and Research Question

While defense industries [1] across three largest European countries, i.e. France, the United Kingdom and Germany, are to a certain degree comparable in size, they differ widely in terms of (state) ownership, company size and export orientation (Mölling, 2015). Remarkably, the different models of defense industries largely resemble the institutional differences observable at the overall political economies of these countries. Perhaps most interestingly, some national defense industries remain relatively untouched from business cycles fluctuations of other industrial sectors, even in times of economic turbulence, or against the backdrop of uncertainty in economic competitiveness for export markets. Particularly striking is the case of the French defense industry, which has increased its turnover in spite of a deep economic crisis and budgetary cuts. What is more, the French defense industry has increased its turnover compared to other major European arms producing countries over the past ten years (see Figure 1.1).

Given the lack of competitiveness and economic hardship in the French economy in the past decade, particularly in the "de-industrializing" manufacturing sector (Ministère des Finances, 2014), this development stands out and deserves further attention. Thus, in order to piece together this puzzle, it is critical to further investigate the particular institutional framework of the French defense industry within the political economy of France. Therefore, this thesis seeks to answer the question: *Why has the French defense industry outperformed its European counterparts and continues to be successful in the domestic, European and the global defense market, and which role do changing institutional frameworks play regarding the economic performance of the French defense industry?* Methodologically speaking, the observed outcome of this study is defined as the economic performance measured as the overall turnover of of the French defense industry. Building on the typology of the transformed *dirigiste* model by Schmidt (2003) and incorporating comparative political economy literature, changing institutional frameworks in the French defense industry are treated as the principal causal condition

Figure 1.1
Turnover of Largest European Defense Industries (100 = 2004). *Note*: Values for the United Kingdom based on 2007 figures. France: Thales, DCNS, Nexter Systems, Safran, Dassault Aviation. Germany: Thyssen Krupp Marine Systems, Rheinmetall Defence, Krauss-Maffei Wegmann, Dhiel Defence, Atlas Elektronik. United Kingdom: BAE Systems, Babcock International.



Author's illustration, based on data provided by DGA (2012) and DGA (2015)

for the observed outcome. Hence, this study follows the new institutionalist paradigm that "institutions matter" (e.g. North, 1990), i.e. that institutions influence and structure beliefs, actions and, ultimately, outcomes. The underlying assumption of the theoretical framework is that complementary institutions in line with a form of state-capitalism, as defined by Schmidt (2003), are beneficial for economic performance. This is not to say that other variables, such as a transforming global market for defense equipment or productivity changes of competitors do not play a role. These variables will not be considered here, due to the thesis' focus on national institutional frameworks and its limited scope. However, by taking into account the evolution of institutional frameworks in comparable defense industries through cross-country comparison, we seek to contextualize the evolution of the French institutional frameworks and, thus, control for others variables.

1.2 State of the Art

How can the good performance of the French defense industry be understood? There is no clear theoretical account that offers a coherent explanation of economic performance in the French defense industry. While there is a large body of research on the political economy of France as well as on the French defense industry in particular, there is no explanatory account for the institutional foundations of economic performance of the defense industry. Which theoretical accounts could help to explain the economic performance of the French defense industry? The following section presents the state of the art both in comparative political economy and the study of defense industries, and lays the ground for the theoretical framework of this thesis.

Much has been written on the political economy of France in general: conventionally, scholars have portrayed France as a form of "statism" (Shonfield, 1965) or dirigisme, i.e. a state-directed economic system in the post-war period (Katzenstein, 1978). However, by the early 1980s, France was widely regarded as a degenerated dirigiste model at best, while some scholars no longer identified "any model at all" (Schmidt, 2016, p. 2). Building on, amongst many others, the groundbreaking study on the post-war political economy of France and the United Kingdom by Hall (1986), comparative political economists have systematically developed the influential Varieties of Capitalism (VoC) approach. VoC depicts the French model of capitalism as a – disadvantaged – outlier in a dichotomized model of varieties of capitalism; high quality products fabricating, export-led coordinated market economies (CMEs, prototype: Germany, the Netherlands) on the one hand, and highly innovative and profitable liberal market economies (LMEs, prototype: USA, UK) on the other hand (Hall and Soskice, 2001). Stemming from "historical institutionalism" (Thelen and Steinmo, 1992) and building on the concept of "path dependency" (Pierson, 2000), this firm-centered account interprets the stability and resilience of these models against external pressures as a consequence of self-reinforcing institutions. From this perspective, national economic institutions of these two models are marked by functional and complementary configurations, giving them inherent competitive advantages. According to the VoC approach, France should face severe economic challenges in a fundamentally changing environment. Consequently, some scholars have portrayed France as on its way towards a financialized system shaped by neo-liberalism (Morin, 2000; Orléan, 1999). However, as opposed to this (simplistic) dichotomized typology, a number of scholars have created additional ideal types. With regard to France, Schmidt (2003), amongst others, identified a third model: a continued, albeit transformed role for the state in the French economy, coining the term "state-enhanced"

market economy. At the turn of the millennium, other researchers went as far as claiming that the French economy, rather than being in a tough spot due to the lack of complementary institutions, should be returning to growth which then, in turn, should lead to a "reinvention of the French model" (Amable and Hancké, 2001, p. 131). While it is always easy to discard past forecasts as false with hindsight, it is useful to take previous industrial sector forecasts into account, even when the predictions are inaccurate. Remarkably, the institutional frameworks of the French post–war defense industry had been largely in line with the overall institutions of the post-war dirigisme of which it had been a major building block. Given the growing importance of institutions in the field of economics and defense cooperation located above the national level, i.e. at the European Union (EU) level, a comparative perspective with reference to the evolution of supranational institutions is necessary: By the late 2000s, many scholars of comparative political economy moved beyond the original, dichotomized VoC typology and developed more nuanced typologies. Similarly, scholars began to open up to an international and European perspective on national political economies – an important perspective due to the growing significance of international and European regulation on national political-economic institutions (Schmidt, 2016).

Generally, scholars of defense industries have had a different perspective than scholars of comparative political economy. Most scholars of international relations have focused on the implications of defense industries for national security and have, therefore, largely neglected comparative institutional configurations (e.g. Kapstein, 1992). Others have studied the relationship between economic and military power from a historical perspective (Kennedy, 1987), the relationship of technological innovation and war (Creveld, 1989; Milward, 1979), or the role of war in state making in western Europe (Tilly, 1984; Finer, 1975). Another influential strand of literature – often with a focus on the United States – has established the so-called military-industrial complex (MIC) approach (amongst others: Markusen, 1991; Mills, 1956): In this approach, according to Markusen amongst others, a coalition of lobbyists from the U.S. defense industry and civil servants of the U.S. Department of Defense shaped and fostered high levels of public defense spending. From a similar perspective Hooks Hooks (1992) studied the capacity of the U.S. administration, more specifically the Pentagon, to implement an industrial policy in the name of defense by investigating the power relationship between the state and the defense industry. He showed how the U.S. administration – a government conventionally regarded as comparably "weak" – advanced technology in key high-tech industrial sectors, albeit by disregarding economic industry interests (i.e. competitiveness) and fostering its own

industrial interests.

From a comparative political economy perspective little attention has been paid so far to the French defense industry. What is more, existing research lacks a comparative account of the political economy of defense industries in the largely fragmented European market for defense goods. However, some scholars have looked at the role of the French defense industry in the greater French innovation and technological development system (Serfati, 2001; Serfati, 2008). Working with a typology of research policies by Ergas (1987), Serfati illustrates the central role of state-financed research in the defense industry for the telecommunications sector, the aviation industry, and the nuclear industry (Serfati, 2008). Ergas' typology of countries' research policies distinguishes between "mission-oriented" policies and "diffusion-oriented" policies. According to Ergas, mission-oriented policies of the first country group (USA, UK, France) focus on radical innovation with clear cut national goals through more direct ways of funneling R&D funds into research projects particularly associated with objectives of national sovereignty. Countries with a diffusion-oriented technology policy (Germany, Switzerland, Sweden), on the other hand, aim at diffusing technological capabilities throughout the whole industrial structure, thus providing a public good for the industrial sector (Ergas, 1987, p. 458). Hence, according to Ergas, from a comparative perspective, successful technology policy in the defense sector is more likely in countries with mission-oriented policies, like France, and less likely in countries where diffusion-oriented policies are prevalent. However, there is no clear account for institutional cross-country variation in defense industries, nor is there a coherent analysis of the defense industry's place in capitalist economies. Lastly, scholars of the French capitalist model suggest that economic sectors of traditional national interest, such as the defense industry, are potential high performers, if organized according to the French state-enhanced VoC (Schmidt, 2003, p. 550). In this light, the French defense industry is an interesting case for further investigation. Therefore, the following chapter begins by revisiting the evolution of the institutional configurations according to Schmidt's model of France as a variety of state capitalism. Subsequently, building on Schmidt's analysis of the distinct French model, predictions on the likelihood of the evolution of institutional frameworks in the French defense industry will be put forward.

2 Theoretical Framework

In the previous section, a comprehensive overview of theoretical accounts studying the French economy and defensive industries has been presented. Building on the review of these studies, this chapter develops the theoretical framework which rests on the work of Schmidt on the evolution of the French model.

2.1 The French Defense Industry: Dirigisme or State-Enhanced Capitalism?

The aforementioned study by Schmidt offers a comprehensive framework for the analysis of the political economy of France. While Schmidt portrays the post-war French state as the mediator for inter-firm relations, as a planner of medium-term corporate strategies and as interventionist in enforcing wage bargains (Schmidt, 2003, pp. 528-530), her analysis also incorporates institutional changes that have taken place in the late 20th century (Schmidt, 2003, p. 548). Schmidt structures her typology along the dimensions (1) government role, (2) business relations and (3) industrial relations. Along these three dimensions, a certain institutional change has occurred in all three models:

First, the role of the French government vis-à-vis business is viewed as still "enhancing", in that it lost much of its interventionist planning capacity in the post-war period but, still seeks to influence business, albeit through less apparent channels. Its policies toward labor, by contrast, have changed from an "organizer" of labor to a "bystander" and "moralizer" role. In contrast, Germany as the CME ideal type has kept its "enabling" and "facilitator" approach towards business and continues to be a bystander when it comes to labor. The United Kingdom as the LME ideal type has become even more liberal towards both business and labor.

Second, business relations in France have changed from state-mediated and state-led inter-firm relations towards more competitive relations with a higher degree of business autonomy. However, they are more coordinated than in the United Kingdom, since elite networks continue to exist. Moreover, in line with findings by Goyer (2010), principal investment sources for firms tend to be other firms and short-term, impatient capital markets rather than the state itself. Consequently, time horizons tend to be shorter. Goal definitions of firms have changed

from state-defined national political economy priorities towards a high degree of firm autonomy. In Germany, traditional and central network relations have disintegrated to a certain degree, capital markets have gained importance and time horizons are less long-term than they used to be. However, firm goals continue to be determined by stakeholder values. In the United Kingdom, business relations are even more competitive than in the post-war period and time-horizons have become even shorter. Much like in the post-war political economy of the United Kingdom, goals continue to be determined by shareholder value.

Third, in France industrial relations have changed from strictly adversarial management-labor relations towards neutral relations. Moreover, formerly state-controlled wage bargaining is nowadays radically decentralized. In contrast, German industrial relations have not changed decisively and continue to be marked by co-operation in management-labor relations and co-ordination in wage bargaining. In the United Kingdom like in France, industrial relations are less adversarial than before and wage bargaining is now radically decentralized.

Table 2.1 sums up the typology of three varieties of capitalism with a special reference to the evolution of the French model. In order to test Schmidt's typology, an empirical analysis will serve to assess the status-quo of the French defense industry. Therefore, the following section formulates the predictions on the likelihood of changes to institutional frameworks in the defense industry.

Following Schmidt's typology of France as a model for "state-enhanced", or more simply, state capitalism, one should expect certain institutional frameworks to be prevalent in the defense industry:

1. Role of the state: The role of the state towards business should be less of an interventionist and administrating planner state and more of an enhancing, influencing state. The role of the state towards labor should be less of an organizer and more of a bystander and moralizer.

2. Business relations: Inter-firm relations should be less state mediated and more competitive, although less competitive than in LMEs due to persistent elite networks. Furthermore, firms should rely on capital market and inter-firm financing rather than state financing. The state should still be dominant in setting national political-economic priorities and time horizons should maintain a long-term view.

3. Industrial relations: Management-labor relations should be less adversarial and more pacified and neutral. Wage bargaining should be radically decentralized and less state-

Table 2.1
Three Varieties of Capitalism according to Schmidt

	State Capitalism (France – until the 1980s)	State Capitalism (France – since the 2000s)	Market Capitalism (United Kingdom)	Managed Capitalism (Germany)
(1) Government role				
Policies towards business	Interventionist	Newly "enhancing"	More liberal	Still "enabling"
	Director	Much more liberal but still seeks to influence	More arbitrator	Still facilitator
Policies towards labor	Organizer	Newly bystander, "moralizer"	More of a bystander	Still bystander
(2) Business relations				
Inter-firm relations	State-led State-mediated	Competitive End of state mediation Autonomous	More competitive contractual, individualistic	Still cooperative but loosening network relations
Investment sources	State	Firms, Capital markets	Capital markets	Firm, Banks, Capital markets
Time horizons	Medium-term view	Less medium-term view	Shorter-term view	Less longer-term view
Goals	National political-economic priorities	Firm autonomy	Shareholder values	Stakeholder values
(3) Industrial-relations				
Management-labor	Adversarial	Neutral	Neutral	Still cooperative
Wage bargaining	State-controlled	Radically decentralized	Radically decentralized	Still coordinated

Source: Schmidt (2003, pp. 529, 548)

controlled.

By way of formulating predictions on the basis of Schmidt's typology and testing these predictions against the empirical evidence in the French defense industry, the author has twofold in mind: First, it will be possible to discern the general evolution of the French post-war *dirigiste* model towards today's state-enhanced model on the one hand from the developments in the French defense industry. In doing so, the author has the refinement of Schmidt's typology in mind: through a more nuanced view of the evolution of institutional frameworks, the author seeks to develop a more accurate perspective of the French capitalist model and the institutional complementarity that exists within it. Schmidt herself had hinted at this possibility: In Schmidt's view, the traditional French model of hierarchical state-firm relations has advantages in industrial sectors, such as the defense industry and the infrastructure and transport industry, where national priorities prevail over rates of return and heavy state-financed investments are needed over longer time horizons (Schmidt, 2003, pp. 549-550). Hence, by analyzing institutional frameworks in the French defense industry, it is intended to draw attention to this important sector. Second, it will be possible to contribute to the academic debate on defense industries through the lens of comparative political economy: As stated above, there is a large research gap regarding the comparative political economy of defense industries. Hence, the author aims at revealing institutional particularities in French defense industry vis-à-vis the British and the German case. In the following section, the methodological approach of the study will be presented.

2.2 Methodology

In line with other studies on institutional frameworks and economic performance in specific industrial sectors, such as work by Casper and Matraves (2003) on the pharmaceutical industry in Germany and the UK, this study aims to analyze how specific institutional frameworks in a given sector of the economy evolved and attributed to the economic performance of the defense industry. By focusing precisely on state-industry relations, this approach is most suitable for illuminating the impact of institutional frameworks on the performance of the defense sector. Additionally, by making cross-national references to variation and similarities, this study aims at complementing existing research on general competitiveness and performance of national political economies.

In order to capture the causal mechanism behind the observed outcome – i.e. the outstanding

economic performance of the French defense industry – a suitable methodology is necessary. While research in social sciences relies increasingly on inferential statistical models – a method that has strong merits particularly in measuring the size of causal effects through correlation –, this study applies a qualitative approach aiming at the refinement of the theoretical framework. A rather deductive (theory-testing) mode of process tracing, i.e. "testing whether the observed processes among variables in a case match those predicted by previously designated theories" (coined "process verification" by Bennett and George, 1997, p. 5), and the in-depth studying of a single case allow for the refinement of the theoretical framework (Trampusch and Palier, 2016, p. 451). Refinement is what this study has in mind; first, by deriving predictions from the theoretical framework regarding the general political-economic institutions, it is – in a second step – intended to contrast the evolution of the institutional framework in the defense industry from the formulated predictions. In doing so, it will be possible to illustrate where the theoretical framework corresponds with the empirical evidence, and where sector specific particularities exist.

Moreover, process tracing may help to disclose causal inference by exploring the causal path which resulted in the observed economic performance of the French defense industry. While data scarcity inhibits the definitive identification of causal mechanisms, this study nevertheless aims at contributing to the debate on political-economic institutions and the performance of economic sectors. Furthermore, notwithstanding the important foundations which were shaped in the post-war period, this study adopts a post-Cold War perspective, focusing on the adjustments of the French defense industry to the fundamentally changing security and defense environment after the end of the Cold War. However, while all events within this time frame are important and fundamentally part of the traced process, the bulk of events is concentrated towards the end of the 1990s, when consolidation within the French defense industry took place and the French state faced critical decisions regarding the future of the defense industry. Analyzing these temporal sequences is particularly important to understand why these decisions have been taken and for what purpose. Through contrasting these significant developments with comparable European defense industries, we intend to provide sufficient evidence for the particularities of the French case and control for other variables. However, it is noteworthy that by analyzing institutional frameworks of the French defense industry, the author by no means implies a deterministic relationship between a particular configuration of political-economic institutions and economic performance. Instead it is intended to illustrate the characteristics of the particular defense industry and the complementaries that exists with the French capitalist model. Therefore,

this thesis seeks to contribute to the extensive literature on varieties of capitalism and provide insights to an industry that – until now – is largely understudied from a comparative political economy perspective. In summary, process tracing according to Bennett and George (1997, p. 5) fits the methodological requirements for the present case study in enabling an analysis of a previously understudied industrial sector, while, at the same time, iterating between empirical observation and existing theoretical frameworks and, thus, contributing to the literature on the French capitalist model.

As a consequence of the sensitivity of the subject, data and information on the defense industry are made available less frequently and less detailed and are as a whole, more difficult to access than in other industrial sectors. In order to illustrate the institutional developments within the French defense industry, this study draws mostly on relevant primary and secondary literature, such as international, French, and German quality newspaper articles, business press and specialized press from the defense sector. Moreover, primary sources, such as documents published by state agencies, annual reports of defense contractors, business associations and other stakeholders are extensively referred to in this study. When accessible and sensible, data bases with quantitative data, e.g. on country and sector specific expenditure for research and development (R&D) (OECD), on firm level performance (DGA), arms exports (EEAS), and the share of defense procurement collaboration (EDA), are consulted in order to provide descriptive statistics. In order to support the validity of the analysis, we reiterate between empirical evidence and established studies by scholars of the French political economy and sectoral analyses. Particularly useful in preparing this thesis was the work by Casper and Matraves (2003), who has extensively studied the French defense industry with a special reference to innovation and research, as well as a study by Casper and Matraves (2003) inspiring the structure of this thesis. Moreover, a research grant at the Franco-German Institute enabled the author to access an extensive data base of newspaper articles as well as French business press on the matter.

2.3 Defining the Defense Industry

In order to effectively capture the level of analysis, it is indispensable to define and delineate the defense-industrial sector. How the defense industry is defined will depend on the questions asked and likely affect the results of a given study. For this purpose, scholars of defense industries developed the so-called Defense Technological and Industrial Base (DTIB) concept. According to Dunne, one of the most renown scholars in the field, the DTIB "constitutes those companies

which provide defense and defense related equipment to the defense ministry" (Dunne, 1995, p. 402). There are, however, many differing and competing definitions once operationalization of DTIB takes place. Determining whether a given firm is part of the DTIB can either depend on the degree of connectedness to military action (i.e. lethal products vs. non-lethal products, such as vehicles, vs. all goods produced for the military, including food) or on a hierarchy between system integratory contractors and producers of low levels components which can be both of military and civil use ('dual- use') (Hartley, 2007; Dunne, 1995, pp. 402-403). The decision on what to include in the definition of the DTIB may also depend on the country (or countries) considered. Moreover, the changing role of the state has rendered Dunne's original definition less accurate due to rising export shares, trans-nationality of defense contractors, and even non-governmental consumers of defense equipment broadening the national scope of the definition. Finally, the scope of a given study is likely to depend on data and resource availability, as only particular parts of the defense industry might be transparent enough to allow for a proper scientific investigation, which in turn influences the applied definition of the DTIB.

Due to this study's focus on the institutional frameworks and economic performance of the French defense industry, it is crucial to employ a broad definition of the DTIB which accounts for the particularities of the French case and, at the same time, incorporates its large variety of defense-industrial contractors. For example we include parts of the civil aeronautics industry, as this industrial sector is entirely captured by the same institutions that had been originally set up to regulate the defense industry. Furthermore, we include trans-European defense contractors, as these firms make up for a considerable and increasing part of the French defense industry. Therefore, in this study, the French DTIB includes state-owned national champions with close to 100 percent defense orientation (DCNS, Nexter Systems). Second, it includes defense contractors with a lower proportion of defense-related production but a crucial input to highly competitive, often export-oriented high-tech products from the defense sector, such as aircraft, vessels or satellites. These firms are often active within the electronics and aeronautics sector (Thales, Dassault Aviation, Safran). Finally, it includes trans-European defense and aeronautic contractors that were originally created through mergers of formerly state-owned French defense contractors on the European level. In all of the cases, important parts of these trans-European firm originate from French firms and large parts of their production continue to be located within France (Airbus Group, MBDA). A particularity of the French DTIB is the small proportion of small and medium-size enterprises (SMEs). In contrast to other European defense industries – especially compared to the German DTIB – French SMEs account for less

than 1 percent of defense-industrial production and, as subcontractors, are highly dependent on the national champions (Serfati, 2014, p. 55). What is more, due to their quasi-absence in the political discourse, SMEs play a negligible role when it comes to reforms of institutional frameworks.

3 Institutional Frameworks in the French Defense Industry

The transformation of the French defense industry resembles not a mere business cycle deviation from the post-war system, but a radical change of its organization and logic: the whole French production system that had existed from the post-war period until the 1990s changed profoundly from a system of "administrated regulation to an economic logic" (Hébert, 2006, p. 9). How did this "secularization" (Hébert, 2006, p. 9) of state-industry relation take place? This section commences by taking a look at the historical evolution of the French economy in general and then contextualizes the role of the French defense industry in particular. In doing so, it introduces the reader to the important institutional foundations that were created in the post-war period. Subsequently, the role of the defense research, procurement and export agency DGA will be discussed, as it is widely considered to be the dominant actor in state-defense industry relations. The third section analyzes the evolution of state ownership in the French defense industry and the fourth section analyzes the role of financing research and development in the French defense industry. Finally, the last section examines the indispensable role of the French state in promoting arms exports. In all of the following sections, the ramifications of the evolution of political-economic institutions on the theoretical framework will be discussed by contrasting the evidence produced in the sections with the previously formulated predictions.

As stated above, the French economic model has traditionally been portrayed as a form of state capitalism. In the post-war period, French elites began to refurbish the economic institutions of the then agriculturally dominated and industrially stagnant country by extending state control over key sectors of the economy (Hall, 1986). Through nationalizing large parts of the banking sector, the creation of the École Nationale d'Administration (ENA) aimed at recruiting highly skilled senior civil servants, and the founding of a national planning commission, the Commissariat Général du Plan (CGP), de Gaulle and his French post-war governments gave birth to the institutions which were to shape its economy for decades to come (Zysman, 1983; Hall, 1986). However, the international wave of neo-liberal, supply-sided policies of the 1980s did not leave France untouched. Although initiated by a new wave of nationalizations under the socialist president Francois Mitterrand and his left wing governments, 1980s were marked

by fiscal austerity, labor market reforms, and liberalization of the financial markets. Moreover, by the late 1980s, under Mitterrand's second term, the state launched a large scale privatization program, with public sector employment falling heavily throughout the late 1980s and the 1990s (Schmidt, 2003; Israelewicz, 1999, p. 120). However, deregulation and privatization of key infrastructure sectors – as demanded by EU directives – were only implemented as far as necessary. Labor market deregulation and wage-bargaining decentralization were vigorously pursued, and union membership rates dropped significantly to less than ten percent of the work force: the state gave up its entire system of enforced wage-bargaining and introduced highly flexible working-time rules (Howell, 2008, pp. 236-237).

How does the French defense industry relate to the origins of the French production model? Large scale production of weaponry and defense products has a long history in France. Major French defense contractors, such as the shipyard Direction des Constructions Navales (DCNS, formerly DCN) or the terrestrial defense contractor Nexter Systems, have a long history dating back to the creation of the so-called arsenals by Jean-Baptiste Colbert, the influential prime minister of Louis XIV (Levi and Verdier, 2004, p. 11). After the devastation of the second world war, for the first time in centuries, France became dependent on foreign (American) military aid. However, with the return to power of Charles de Gaulle in 1958, French defense-industrial policy was reformed profoundly. This shift was in line with greater Gaullist policies aimed at independence through the strategic development of French weaponry, kick-started by an increase in domestic defense spending and co-financed by a proactive export policy to former colonies. In short, de Gaulle established the defense industry as the nucleus of the French post-war production system (Serfati, 2001, p. 223).

A key role in the consolidation and concentration of the French defense industry is attributed to the so-called technological programs in the early 1960s. In sectors determined to be of vital interest to France (i.e. nuclear energy supply and deterrence, space and aviation and general defense equipment production) French governments under de Gaulle's first presidency created specialized, sectoral research agencies These agencies were under the oversight of the French procurement agency DGA and, therefore, lay out the institutional foundations for long- term, state-directed and publicly financed research and development (R&D) (Serfati, 1997, p. 75). Now able to compete on international export markets by offering high-tech equipment, the industry's focus for arms exports began to pivot from former colonies to countries belonging to the Non-Aligned Movement (NAM), and the recently established European market. Well-known military technological programs, such as the development of the nuclear force the frappe, also

contributed to France's (self-perceived) role as an independent player in the international arena. Thereby, these programs helped to (re-)integrate military elites which had been deceived by de Gaulle's consent to the disintegration of the French colonial empire, especially the secession of Algeria from France in 1962 (Serfati, 2001, p. 223).

The aforementioned early 1980s nationalization wave by Mitterrand did not leave the defense sector untouched: several aeronautics and electronics contractors were nationalized, including electronics giant Thomson-CFS, the private aviation firm Dassault as well as Aviation Nord and Aviation Sud, which were merged as Aérospatiale. Subsequently, a consensus among right-wing and left-wing Gaullists emerged on defense-related industrial policy. Henceforth, politicians from both sides of the political spectrum agreed that defense programs should act as "an engine for industrial development" (then-Defense Minister André Giraud, cited by Serfati, 2001) and maintain France's rank as a global player. Although ownership patterns have changed considerably since then, the French state continues to play a central role within the French defense industry.

Since the end of the Cold War, defense industries of western Europe in general and France in particular have increasingly come under pressure mainly for two reasons. First, *détente* between the two superpowers significantly reduced the necessity for previously high domestic defense spending. Second, NAM countries – traditionally a large part of the customers base of French weaponry – became less inclined to buy arms from the alternative supplier France due to the disappearance of the bipolar structure of international relations. As defense spending in Europe also plummeted, the second potential European customer base of French weaponry also dropped out. These changes in the international environment caused a remodeling of firm strategy and state-industry relations throughout the 1990s in order to successfully compete on the European and the global arms market. The following section offers an analysis of the evolution of the French defense industry throughout the post-Cold War period.

3.1 The Délégation Générale de l'Armement - From Dominance to Oversight

Since the 1960s, French state-defense relations were dominated by national priorities, i.e. strategic autonomy, nuclear deterrence and technological advancement, over private-sector interests. In order to provide these goods, the French state set up a particular institutional framework within the French defense industry which continues to mark French state-industry relations to

this day. At the heart of this production system is the powerful procurement agency *Délégation Générale de l'Armement*. In order to better understand the role of the state within the French defense industry, this section begins by illustrating the central role of this agency in the field of state-industry relations. French particularities, such as the dominant role of elite networks, will serve to exemplify its central role. Subsequently, we will demonstrate how – from the mid-1990s onwards – the DGA has been partly sidelined within the ministry of defense and the defense procurement system in general.

3.1.1 The DGA – Origins and Traditional Role

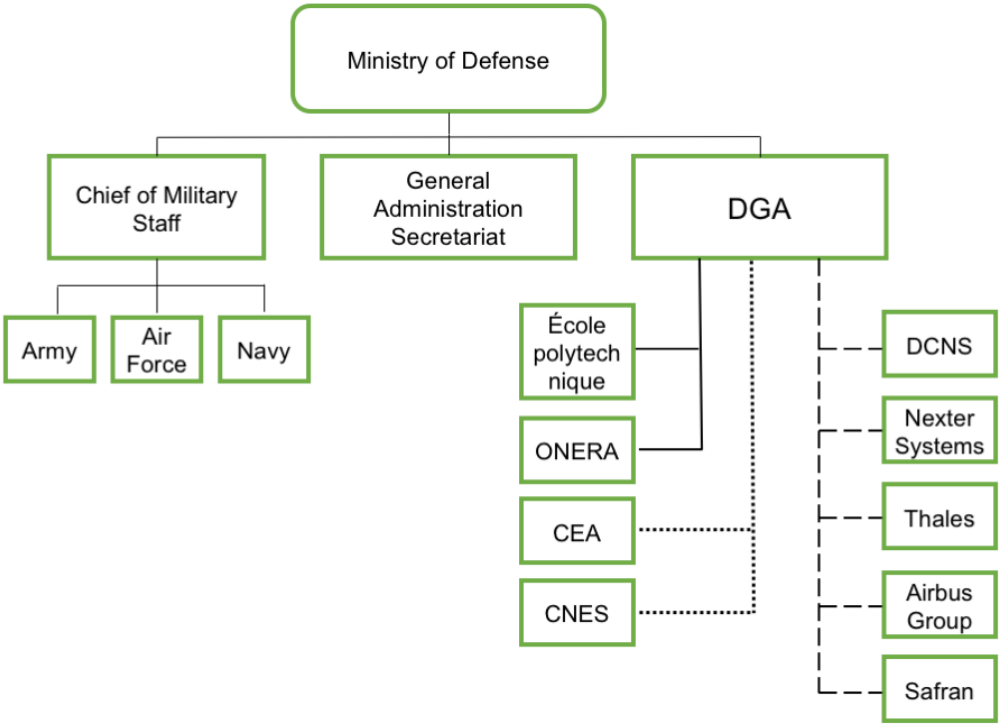
The DGA has been – and in some ways continues to be – the one intersection of all actors relevant for the projection, procurement, production and export of industrial defense goods. Created in 1961 by General de Gaulle (Décret n°61-308, 1961; Arrêté du 6 avril, 1961), the then-Délégation Ministérielle pour l'Armement (DMA) took its present name in 1977. Concentrating many former directorates formerly dispersed under the authority of the French Ministry of Defense, the creation of the DGA aimed at centralizing working procedures and, thereby, power, which had formerly rested within each military branch, into one single agency. The directorates now under DGA authority include (Comité pour l'Histoire de l'Armement, 2002):

- D.E.F.A. (now Nexter Systems) – Direction des Études et Fabrications d'Armement, the conventional ground weapons producer
- D.C.C.A.N. (now DCNS) – Direction Centrale des Constructions et Armes Navales, the national ship yard
- D.E.N. (now Safran) – Engine and Missile directorate
- D.T.I.A. (now Airbus Group) – Direction Technique et Industrielle de l'Aéronautique, the aircraft construction directorate
- POUDRES (now Nexter Systems) – The gun powder directorate
- D.A.T. (now CEA) – Département Atome, the atomic research agency

Even though the internal organization of the DGA and its tasks have changed considerably since the 1990s, its central position within the French Ministry of Defense remains of the reasons why the DGA is still influential in the French defense industry (Joana, 2008, p. 53): Alongside the military leadership branch known as *État-Major*, the DGA is one of the three main branches

of the ministry – the third being the administrative support division (see Figure 3.1). Since the creation of the DGA, its managing top civil servant, the *Délégué Général pour l'Armement*, has the rank of a state secretary and is granted privileged access to the office of the defense minister. This title allows for an advantaged position vis-à-vis the military leadership, the Chief of Military Staff(Cohen, 1984, p. 217): as a consequence, industrial interests have often prevailed over military needs. In contrast to the other branches of the Ministry of Defense, the DGA employs mostly civilian personnel, i.e. engineers and scientists. Moreover, due to the aforementioned political consensus on the necessity of arms production autonomy formed in the 1980s, the DGA had traditionally not faced overly critical oversight from the political side of the government and, thus, enjoyed a degree of autonomy unseen in other European countries (Dillon, 1988; Hébert, 1991). However, the DGA saw some of its autonomy within the French Ministry of Defense abolished, as the French defense industry came under increasing pressure due to cost-inefficient procurement and an overly technology-focused approach.

Figure 3.1
The DGA within the Ministry of Defense: Straight line – direct authority; dashed line – double trusteeship with APE through shared delegation of members to executive boards; dotted line – double trusteeship with Ministry of National Education.



Source: Author's illustration based on Ministère de la Défense (2016)

Another stronghold of the DGA is its key position within the French secondary educational system. This relationship, studied by (Suleiman, 1978), (Bourdieu, 1989), and later incorporated into the French model of capitalism by Schmidt (2003), the French elite universities Grandes Écoles play a key role in French state-business relations. The publicly accepted – and even facilitated – alternating of French top managers and bureaucrats between top administrative posts and business spheres is commonly referred to as "pantouflage"[2] (Bouzidi et al., 2010; Comité pour l'Histoire de l'Armement, 2002). Pantouflage is widespread in the defense industry, mostly through a nexus between the Grande École École polytechnique (often referred to simply as 'X'), French politics and now publicly-traded defense contractors. The École polytechnique is one of the most prestigious Grandes Écoles and reports directly to the DGA. A majority of DGA top civil servants are graduates from the École polytechnique and rotate between top business and administrative positions (see Table A.1). This close biographical connection between the DGA bureaucrats and the defense industry is interpreted by many scholars as a necessary condition for DGA-led armament projects: Menon (2000, p. 160) claims that an "intensive movement of personnel" has made business leaders "natural allies" of the DGA in pursuing large scale prestige projects. DeVore and Weiss (2013) accordingly argue that in the 1980s and 1990s pantouflage played a key role in enabling the aircraft manufacturer Dassault Aviation to lobby the DGA into the enormously expensive and entirely national Rafale combat aircraft program. Although cost inefficiency and the overly technology-driven approach attracted criticism by the French public in the 1990s, the pantouflage system remains largely intact to this day: The majority of bureaucrats from all levels in the DGA and top managers of French defense contractors graduated at École polytechnique in Armament Engineering. In fact, virtually all acting CEOs of the defense contractors Thales, Nexter Systems, DCNS and SNECMA as well as French government-delegated governors within the trans-European Airbus Group and the missile manufacturer MBDA are alumni of the École polytechnique. However, the pantouflage system is not entirely stable, as new elite networks gradually enter the system. With the creation of the French holding company Agence des Participations de l'État (APE), graduates from other Grandes Écoles, such as the ENA and Sciences Po, now supervise the state's shares in publicly-traded defense contractors. Lastly, other than being simply in charge of equipment procurement, the DGA is charged with maintenance and quality control of defense equipment used by the French military, a policy mission (general orientation, elaboration of concepts, oversight of armament programs) and, most notably, acts as a research agency. After profound reforms throughout the 1990s, the DGA continues to finance large parts of defense-related R&D and exercises managerial authority over

state-owned research institutes (see Figure 3.1 and Section 3.3).

3.1.2 The 1996 Reform of the DGA

The early 1990s are characterized by an abrupt change in the international market for defense equipment. The end of the Cold War reduced the perceived military threat and thereby the necessity to acquire defense equipment domestically, in NAM countries and in the European defense market. Moreover, increasing budgetary deficits and fiscal austerity in the wake of the Stability and Growth Pact (SGP) forced the French Ministry of Defense to look for potential cost reductions, resulting in a complete challenging of French defense-industrial policy. Consequently, the White Paper on Defense published in 1994 considers importing defense equipment in order to save money and emphasizes the necessity of cost orientation in procurement: "Costs have to be at the heart of these [procurement] decisions"[3] (original emphasis in White Paper, 1994, p. 129). Furthermore, in contrast to the 1972 White Paper, the 1994 version deliberately neglects to define the role of the DGA in defense industrial policy and instead speaks only of "the state" (Hébert, 2006, p. 37). The DGA, at that time still largely organized along the institutional frameworks set up under de Gaulle, had primarily focused on technological innovation and is now considered to be highly cost inefficient. Hence, the DGA becomes one of the focal points for criticism of defense spending, both in the media and the French ministry of defense (e.g. Isnard, 1994; La Tribune, 1994a). In November 1995, the new framework military budget law for the period 1995 – 2000 was introduced into the National Assembly, sparking a public debate on the need to reorganize the French system of arms procurement (Best and Provost, 1995). Under pressure, Defense Minister Charles Millon declared that French defense contractors should imitate the "private sector culture of cost optimization"[4] (Millon cited in La Tribune, 1995). In this climate, the French council of ministers appointed Jean-Yves Helmer as head of the DGA. This was significant, because for the first time the DGA was to be managed by a civil servant who did not graduate from the École polytechnique and who was renowned for implementing market-based reforms in the then-publicly held automotive manufacturer PSA. Helmer's appointment was portrayed in the French media as "an electroshock for industrial restructuration"[5] (La Tribune, 1996a). Under Helmer's leadership and after a long series of smaller reforms of the French military and the Ministry of Defense throughout the early 1990s (abolishment of the draft, reduction of active personnel, etc.), the French state drastically restructured the DGA in late 1996 along private sector management procedures, introducing four major changes (Colson, 2005, p. 23):

1. Definition of clear objectives with regular reporting on progress and medium-term perspectives
2. Explicitly assigned project managers with process-oriented project teams (including specialists from all stakeholders)
3. Parsimonious allocation of resources to medium scale projects
4. Continuous control of managerial activities, verifiable by clearly defined parameters.

The 1996 reform resulted in two major consequences: First, it established a more arms-length relationship of the DGA with its arms producing directorates and transforms the DGA's role vis-à-vis the industrial workforce. Helmer's reform changes the DGA's role towards that of a bystander instead of a main employer in the defense industry -– a new role that soon had to face its first real world test. After receiving a complaint by the Military Chief of Staff about delayed deliveries and maintenance by a Toulon-based dock of the then-DGA subordinated ship builder DCN, Helmer encouraged the Military Chief of Staff to cancel long time contracts with the DCN docks and award maintenance contracts to a private dry dock in Marseille in order to "show [to the workers] that not everything is to be taken for granted [...] and that if they are not capable of delivering on the delays and the costs, we [the government] will go elsewhere"[6] (Helmer, cited in: Levi and Verdier, 2004, p. 83). The subsequent three month long strike by dock workers of the DCN Toulon docks received little solidarity from other DCN shipyards and, consequently, was ineffective. Eventually, the DCN Toulon docks were forced to adopt private sector-inspired work procedures and conditions and sharply reduce employment (Levi and Verdier, 2004, p. 84). In the ground weapons sector, the French state cushioned eight successive layoffs of more than 75 percent of the total initial workforce at the state-owned GIAT Industries with comprehensive social plans (Viollet and Mignon, 2006). The 2002 Social Modernization Law (Loi n°2002-73, n.d.) passed by the left wing Jospin government had brought two seemingly contradictory innovations: First, layoffs due to business operations were facilitated, resulting in greater employer flexibility. Second, workers were given the power to suspend restructuring plans, to bring in external experts that review the layoff process and to consider alternatives to the layoffs, such as working reduced hours or vocational rehabilitation. Altogether, the new law followed the general pattern of enhancing flexibility while fostering incentives to engage in decentralized social dialogue at the firm level (Howell, 2008, p. 244). Confronted with the most far-reaching restructuring plan in 2003, accounting for the dismissal of more than 6,000 workers, employees and unions invoked the provisions of the new law and

suspended the restructuring plan (Les Echos, 2003a). After extensive protests and strikes by workers, including the participation of the entire spectrum of the politically fragmented French union movement, the French President Chirac appointed Jean-Pierre Aubert, widely renowen by his nickname "Mr. Restructuring" (Les Echos, 2003b). Aubert vigorously pursued the restructuring plan and, at the same time, announced an early retirement plan and a vocational rehabilitation plan amounting to 600m EUR. Additionally, the *French state set up the conversion fund Société Financière Régionale pour l'Emploi et le Développement* (SOFRED) worth 50m EUR targeted at fostering employment in regions where layoffs had been particularly harsh (Les Echos, 2003c). Hence, the evolution of state-industry relations largely followed the patterns similar to other industrial and economic sectors in France. These pattern can be characterized by a liberalization of job protections, combined with the decentralization of employer-worker relations and social compensation for the newly unemployed. However, for now, DCN and the ground weapons defense contractor GIAT Industries remain state-owned and continued to report directly to the DGA. Nevertheless, their partial privatization remained an objective for the DGA to this day.

The second consequence of the 1996 reform can be seen in the introduction of private sector-inspired process-oriented project teams within the DGA. This reform altered the balance of power within the French armament system. For the first time in history, internal working procedures explicitly required a partnership with, and incorporation of the French armed forces into DGA armament programs. These new working procedures strengthened the role of the military in the procurement process – a development that, according to Hoeffler, led to a "return of the military [...] by a civilianization of political instruments"[7] (Hoeffler, 2008, p. 149). However, the relationship between the state and the defense industry was not fundamentally reversed by this reform – even though the original goal of achieving total autonomy in every single armament realm was abandoned, and the overly technology-driven approach by the DGA was watered down, the DGA only partly lost its autonomy. Hence, the overall doctrine of strategical autonomy and technological excellency were not generally put into question (Eliassen, 2002, p. 8).

3.1.3 Conclusion

In summary, the 1996 reform fundamentally reorganized the DGA. Having become a "ministry within the defense ministry"[8] (Teissier, 2011, p. 18), the DGA became one of the focal points for criticism, and the most obvious target for cost reduction. Consequently, the reform altered the

DGA towards a more civil and less autonomous agency and introduced market-based reforms. These reforms streamlined procurement and research facilities along private sector practices and created a more market-based, distanced relationship with the state-owned directorates, thus reducing cost-inefficiencies. The French state helped smoothen the transition process where the negative consequences of this approach became too apparent through the implementation of social plans. Moreover, the reform strengthened the military side within the French Ministry of Defense vis-à-vis the DGA. Procurement was to be pursued according to the needs of the French military, even taking foreign imports of defense equipment into consideration. Thus, the DGA saw some of its unusual autonomy within the French state abolished. Nevertheless, in comparison with other European procurement agencies, the DGA remains the central actor within the national defense industrial system. As Joana puts it: "Even if [the reform] did not turn the equilibrium between different protagonists of armament policy upside down, it contributed to an incorporation of commercial logics into the formulation of military needs"[9] (Joana, 2008, pp. 53-54). In line with Schmidt's typology and largely confirming the predictions formulated regarding the role of the state, the 1996 reform has altered French state-industry relations towards a more liberal, yet still influencing approach. Liberal market-based reforms were introduced and the state stepped back from acting as an organizer of state-labor relations as seen when the DGA refrained from intervening in the dock yard strike. Moreover, much like in the general institutional framework and formulated in the predictions on industrial relations, the French state cushioned layoffs and weakening of labor unions through decentralization of employer-worker relations by introducing state-financed early retirement schemes and vocational rehabilitation plans – a step towards the French model of a business-enhancing, "social anaesthesia state" as formulated by Levy (2008). Nevertheless, as of the late 1990s, the French state continues to be either majority shareholder or direct supervisor of large parts of the French defense industry. The 1996 DGA reform marked only the beginning of a fundamental reorganization of state-industry relations in the defense industry. Hence, the following section traces the evolution of ownership patterns in the French defense industry and discusses its influence on state-industry and intra-business relations.

3.2 Ownership in the French Defense Industry – From Privatization to European Consolidation

Defense industries in Europe have been generally state-dominated and often – at least to a certain degree – state-owned. However, in comparison with other western capitalist countries, state ownership in France has played a more dominant role in the post-war economy in general, particularly in the defense industry. Many of the largest and most well-known French firms and banks share a post-war history of either partial state ownership or complete state control, including the automotive groups Renault and PSA, industrial concern Alstom, the railways company SNCF, the (nuclear) energy suppliers Areva, Gaz de France and Éléctricité de France as well as the banks Societé Générale and Crédit Lyonnais (Schmidt, 1996). From a political economy perspective, the high ratio of state ownership fundamentally shaped the role of the state vis-à- vis business in enabling governments to act as a planning and interventionist state. Since the 1980s, this peculiar role of the French state has changed fundamentally (Hall, 1986). In the defense industry, however, the state clung to its ownership until the 1990s, when the existential demand crisis hit the market for defense equipment and forced market actors to (re-)organize (Fligstein, 2006). In order to assess the role of the French state in organizing the defense industrial sector, this section describes the evolution of ownership patterns in the French defense industry from the immediate post-Cold War situation to its present picture. The strong role of the French state in this restructuring process is then contrasted by the case of the United Kingdom, where industrial consolidation was fundamentally market-driven. Moreover, the evolution of financing institutions and resource allocation are discussed in order to trace the evolution of the French state's planning capacities.

3.2.1 The Starting Point – The French Defense Industry in Crisis

As stated above, a high degree of regulation and state ownership is common in defense industries. However, in comparison to other European defense industries, state ownership is even more ubiquitous in the French defense industry, and has been throughout almost all periods of French history. While the aforementioned 1980s nationalization and (re-)privatization waves altered ownership patterns mostly in the electronics sector and parts of the aeronautics sector, the traditionally state-controlled directorates have remained largely untouched. Consequently, by 1990, around 250,000 direct employees work in the defense industry which is still largely organized along the former directorate dominated post-war structure (Serfati, 2001, p. 225).

In every arms category, there is at least one state-controlled defense contractor: the *Société Nationale des Poudres et des Explosifs* (SNPE) for missile fuel and gun powder, the *Société Nationale d'Études et de Constructions de Moteurs d'Aviation* (SNECMA) for aircraft engines and carrier rockets, the *Direction des Constructions Navales* (DCN) for naval ship building, the *Groupement des Industries de l'Armée de Terre* (GIAT) for ground weapons, *Aérospatiale* for aeronautics and space and *Thomson-CSF* for electronics. Additionally, the second large aeronautics company *Dassault Aviation* is again mostly family-owned since its re-privatization in 1986. Until the early 1990s, French state and industry representatives had regularly stressed the importance of maintaining an autonomous defense industry and therefore, blatantly opposed European consolidation for several reasons (Fontanel and Pilandon, 1992, p. 114); French arms were simply considered to be superior and cooperation thus appeared not to be promising, domestic procurement was seen as a prerequisite to secure employment and strategic independence, and cooperation was expected to result in unnecessary cost increases. However, this perspective evolved over time – the shifting environment in the post-Cold War period exerted significant pressure on the French defense industry as shrinking defense procurement budgets and dwindling exports rapidly turned many of the state-controlled companies into loss-making and oversized liabilities for the French budget. Additionnaly, the French state was repeatedly forced to recapitalize GIAT – adding up to 25 bn. FRF (circa 4 bn. EUR) between 1990 and 1995 alone (La Tribune, 1996b) – as well as other companies, most notably DCN, by comparable sums (Lundmark, 2004, p. 20).

3.2.2 A State-directed Reorganization of the French Defense Industry

Unwilling – and more and more unable (Frankfurter Allgemeine Zeitung, 1995) – to meet the looming necessity to recapitalize the significantly larger electronics and aeronautics firms, by 1995 the state begins to look into alternative options. Then Defense Minister Charles Millon presented the most widely accepted option to "restructure the [French] defense industry through Franco-French and subsequent Franco-European approximation" (La Tribune, 1995), i.e. to privatize and merge loss-making firms. This view was publicly shared by industry officials, such as *Lagardère Group* CEO Raymond Lévy calling for "industrial Europeanism instead of industrial nationalism" (La Tribune, 1997) and Alcatel CEO Serge Tchuruk (Süddeutsche Zeitung, 1997). Similarly, representatives representatives called privatizations "a first positive step that they might support"[10] (L'Humanité, 1998).

In 1996, shortly after being elected President, Jacques Chirac announced the restructuring

of the "over-dimensioned and fragmentized" (Chirac cited in Le Figaro, 1996a) defense industry and pledged to develop promising scenarios for its future on the European level. After his appointment as new head of the DGA (see Section 3.1), Jean-Yves Helmer begins to openly contact potential buyers of the state's "crown jewels" (Le Figaro, 1996a) in order to "regroup [national contractors] around a national base [...] prior to a European perspective"[11] (Helmer, 1996b). The strategy of Franco-French consolidation prior to mergers and acquisitions on the European level was reiterated across the board, for instance by Defense Minister Michèle Alliot-Marie: "In order to resist the global competition the state has to help French firms to European size: We have to start by strengthening national firms; followed by a preference for a consolidation with European partners."[12] (Alliot-Marie, 2006). The state-led consolidation in the French defense industry resembled the 1980s wave of privatizations seen in the French economy, when formerly state-owned corporations were sold to institutional investors, namely stable shareholders (banks), the workforce, and domestic and institutional investors (Hancké, 2001, pp. 320-321). In the end, a stable system of cross-shareholdings built around continuing, albeit reduced state ownership emerged, as seen in the Lagardère Group and the private Dassault holding (see Figure 3.2).[13] In 1996 the French state embarked on the largest reorganization of the defense industry since the end of the second world war – a state-led consolidation which continues until today (see Table 3.1):

In October 1997, the state partially privatized Thomson-CSF to a consortium of Alcatel-Alsthom, Dassault and Aérospatiale. However, the state retained a strong minority share and, thus, a voice within Thomson-CSF. This influence was demonstrated through several attempts to create a trans-European defense giant under French dominance. In 2004, Thomson-CSF (now Thales) CEO Denis Ranque reportedly "felt the pressure in the snake pit called French politics" (Financial Times, 2004) over an (ultimately unsuccessful) government-driven merger attempt with EADS. In 2005, in view of a state-sponsored merger of Thales with DCNS, Ranque conceded that "he won't escape an industrial operation wanted by the state"[14] (Le Point, 2005). The partial Thales-DCNS merger eventually materialized with the entry of Thales into DCNS ownership – under pressure from defense minister Michèle Alliot-Marie (Neue Züricher Zeitung, 2005). However, in contrast to other defense sectors, consolidation has not materialized the naval shipbuilding sector. DCNS and French state officials repeatedly approached its major European rivals, the German shipyard *Thyssen Krupp Marine Systems* (TKMS) and the Italian Fincantieri, to create a trans-European joint-venture based on the EADS model (Alliot-Marie, 2007). After having won a number of export contracts to several countries' military including

Egypt, India, Brazil, and Australia – amounting to a backlog worth more than 50 bn. EUR – DCNS made another attempt to merge with TKMS in summer 2016 (Le Monde, 2016).

The masterpiece of consolidation in the defense industry took place over several years. In the mid-1990s European shareholders in the formerly loose Franco-British-German-Spanish joint venture Airbus eventually realized that Airbus would have to take the form of a genuine European corporation in order to remain flexible and competitive enough to compete on world markets (Bockstette, 2002, p. 12). However, the positions of the principal shareholders differed, as the French and the British had undergone the process of consolidation in the defense and aeronautics industry in the late 1980s. Moreover, both the German and the British governments had opted for a market driven-consolidation with automotive corporation Daimler Benz in Germany and British Aerospace in the United Kingdom in the lead and demanded the same from the French state. Contrarily, the French state sought to "keep Aérospatiale in the lap of the state"[15] (newly-elected Prime Minister Jospin cited in Le Figaro, 1997a). Consequently, in August 1996, Jacques Chirac appointed Yves Michot – a graduate from École polytechnique and DGA official – as head of Aérospatiale specifically tasked with the preparation of a domestic merger of the then state-owned company (Helmer, 1996a). Under pressure from rumors of a British-German agreement to merge British Aerospace and the German DASA, the French state accelerated the Franco-French consolidation. In July 1998, after several unsuccessful attempts to merge state-held Aérospatiale and Dassault Aviation, Michot and his counterpart of the Lagardère-owned defense contractor *Matra-Haute Technologies*, Jean-Louis Gergorin – also graduate from École polytechnique and former diplomat – came to an agreement: the left-wing Jospin government agreed to consolidate the French aeronautics and missile sector by merging Aérospatiale with Matra-Haute Technologies. However, the merger only partially fulfilled the condition of privatization that the German partners – i.e. Daimler Benz and the German state – had insisted on (Le Monde, 1998), with British Aerospace already dropped out. Consequently, in late 1999 Aérospatiale-Matra and the Daimler Benz-owned DASA agreed to create the new trans-European defense contractor European Aeronautic Defence and Space (EADS) – under the condition that the second French shareholder, Jean-Luc Lagardère, will represent the French side in the new company. Worries by French politicians, particularly from the left, about the dominance of the "Lagardère Boys" (Libération, 1999) within the new company proved to be unfounded: after Jean-Luc Lagardère passed away in early 2003, the French state assumed leadership within EADS and installed senior civil servants, such as the École polytechnique and ENA- trained Louis Gallois and Fabrice Brégier, within the company (Barmeyer and Mayrhofer,

2012, p. 201). Eventually, the Lagardère Group and the Daimler Benz sold their shares in EADS and give way to a new governance contract settled in 2012: The German state, represented by a consortium of the state-owned bank Kreditanstalt für Wiederaufbau (KfW) and several state banks, entered EADS and reestablisheed parity with the French state (La Tribune, 2012).

In early 2004, orchestrated by the DGA, state-held engine manufacturer SNECMA and private telecommunications company Sagem merged to Safran, "smoothly privatiz[ing] SNECMA while somewhat 'nationalizing' Sagem"[16] (Le Monde, 2005). From now on, former SNECMA and DGA officials were in the driver's seat and embarked on a mission to take over defense and aeronautic companies across Europe, such as the German defense electronics contractor ORGA Kartensysteme, the Dutch bio-electronics firm Morpho BV, and the trans-European launch vehicle producer Arianespace amongst others (SAFRAN, 2015, pp. 10-11).

After successive layoffs and rationalizations (see Section 3.1), GIAT's profitable core manufacturing division Nexter Systems was seperated in 2006 with the goal to achieve profitability soon (Usine Nouvelle, 2006). In late 2013, the state-held SNPE was incorporated by Nexter Systems in order to "prepare the European consolidation", i.e. create a better bargaining position for European consolidation (La Tribune, 2013). Subsequently, the DGA and the APE pushed for a European level merger of Nexter Systems with the German family-owned ground weapons producer Krauss-Maffei Wegmann (KMW) (Tran, 2015) – under heavy criticism from German policy makers who fear that French dominance within the project will lead to a situation where "the battle tank of the future is a Frenchman" (SPD defense policy spokesperson Rainer Arnold, cited in Frankfurter Allgemeine Zeitung, 2015). In spite of this criticism, in 2015 the French state and KMW agreed to create the EADS-inspired, Netherlands- based joint venture KANT – with the French state remaining on as the sole shareholder in Nexter Systems (Handelsblatt, 2015). In summary, from 1996 onwards the French state pushed for unprecedented privatizations of its formerly predominately state-directed defense equipment producing directorates (see Table 3.1). These privatization, together with mergers and acquisitions on the domestic and the European level, resulted in a far-reaching restructuring of the French defense industry. Today, a small number of defense contractors dominate the French defense industry, some of which have heavy footholds in neighboring countries and have trans-European ties. However, the consolidation of the defense industry is not yet concluded, as continued attempts for the creation of trans-European ground weapon contractors and naval shipyards prove.

Table 3.1
Reorganization of the Top 10 French Defense Contractors from 1990 to 2016

height	Ownership in 1990[i]	Ownership in 2014[ii]
Thomson-CSF	59.2 % State ownership 38.8 % Floating 2 % Companies' own stock	Partially privatized in 1997 and renamed Thales in 2001 26.1 % State ownership
DCN	Directorate under full DGA control	Partially privatized as DCNS in 2003 62.5 % State ownership 35 % Thales 2.5 % Companies' own stock
Aérospatiale	60 % Direct State Ownership 40 % Indirect State Ownership (Through Holding Agency)	Merged with Matra-Haute Technologies in 1999 and subsequently merged with DASA and CASA to EADS. French State interests administrated by SOGEDA group within EADS (now Airbus Group)
Dassault Aviation	Private ownership	70 % Dassault Group (Private) 26.6 % Airbus Group (Partially State ownership)[iii]
GIAT Industries	Directorate under full DGA control	Transformed into private business organization form and renamed Nexter Systems. Joint-Venture with KMW in progress. 100 % State ownership
Matra	100 % Private Ownership (Lagardère Group)	Partially merged with Aérospatiale in 1999 Missile Branch nationalized and integrated into trans-European MBDA. Sells EADS shares in 2012 to the French state.
Snecma	Directorate under full DGA control	Merged with Sagem to form Safran 21 % State ownership
Eurocopter	Franco-German joint-venture by Aérospatiale/DASA	Integrated into EADS (now Airbus Group) in 2000
SNPE	Directorate under full DGA control	Integrated into Nexter Systems
Sagem	100 % Private Ownership	Merged with Snecma to form Safran 21 % State ownership

Source: Author's compilation.

[i] Figures for 1990 taken from Hébert (2006, pp. 21-22). [ii] Figures for 2014 taken from DGA (2012), DGA (2015), APE (2014), and APE (2015) and various sources. [iii] The French state has to be informed prior to any decision taken by the Airbus Group's governor to Dassault Aviation.

3.2.3 Institution Building at the European level

In contrast to the other industrial and service sectors within the internal market, the EU traditionally has had only limited powers in defense-related issues (Pacreau and Schwab, 2007, p. 166). However, the French state deliberately opted for European level consolidation in order to improve the position of its defense industry within a shrinking overall market for defense equipment: With hindsight, Jacques Perget, a former director of the DGA's industrial consolidation unit, admits how in the late 1990s – albeit belated compared to Germany, Italy and the United Kingdom where consolidation at least in the aeronautics sector was largely completed by the late 1980s – "France deliberately decided to follow a policy in favor of European consolidation" [17] (Perget, 2010, p. 90). The French state flanked this consolidation with political initiatives. Having already stipulated the need for a European procurement agency and a "Europe-first" strategy against imports of U.S. defense equipment in the early 1990s (Frankfurter Allgemeine Zeitung, 1994), the French state and the DGA in particular pushed to set out common standards in procurement – which would benefit large French and potential trans-European defense contractors. In 1997, under Helmer's initiative, the European defense procurement agency *Organisation Conjointe de Coopération en Matière d'Armement* (OCCAR) was created in a joint effort by the six largest producers of defense equipment (Financial Times, 1997). Furthermore, in 2001 the newly appointed DGA chief Yves Gleizes pushed for common standards in defense procurement and launched major European defense programs (Gleizes, 2001): Cooperative armament programs, which in most cases include French participation, such as the multinational A400M program, several missile programs, the combat helicopter Tiger, and the Franco-Italian Frigate FREMM – also known as the "largest cooperative ship building project of all times" (Bertges, 2009, p. 154) worth 11 bn. EUR – were henceforth managed by OCCAR (OCCAR, 2016). In the early 2000s, after the first wave of European-level consolidations, EU governments gathered to discuss the development of a European institutional framework for defense cooperation – again led by political initiatives of the French state (Hébert, 2006, pp. 64-65): Eventually, in 2004 by agreeing to set up the European Defence Agency (EDA), EU Foreign Ministers created the institutional framework for EU-guided defense-related R&D and EU-wide procurement of defense equipment. However, for now the EDA remains in limbo, as France and the United Kingdom disagree on its main objective, with Paris opting for defense-industrial consolidation and London emphasizing the need for training projects (Barrinha, 2015, p. 35). Lastly, France has become one of the driving forces behind the liberalization of the European defense mar-

ket. While the defense industry is traditionally exempt from internal market-marking powers by the supranational EU organs, namely the European Commission (EC) and the European Court of Justice (ECJ), however, this exception has been somewhat reduced. France, while initially openly hostile to the reform of Art. 346 Treaty on the Functioning of the European Union (TFEU)[18] as proposed several times by the EC, eventually conceded to a limitation of the national security principle, as it felt that "liberalization was no longer a threat" to the French defense industry, France even proactively negotiated the reform of the EU defense procurement directive (Directive 2009/81/EC, 2009) and, thus, pursued liberalization of the defense sector (Hoeffler, 2012, p. 445). These findings mirror Clift's recent work on post-dirigisme in French state-banking industry relations: Here, too, in an economic sector where state ownership and control had been historically strong, the French state vigorously pursued privatization while, at the same time, retaining signi cant in uence. This influence is then strategically used for "international champions advancement" (Clift, 2014, p. 581).

3.2.4 Ownership in the French Defense Industry Today

Today the domestic part of consolidations in the defense industry has largely concluded. The number of companies has been reduced to effectively seven large defense-industrial groups, two of which are trans-European in ownership and have production sites in several European countries. Generally speaking, state ownership has been reduced, although the exact degree of participation differs along sectoral boarders: the state retains majority ownership of defense contractors in the ground weapons and shipbuilding branch (Nexter Systems, DCNS) and minority participations in the (micro-)electronics, missiles and aeronautics sector (Thales, Safran, Airbus). Additionally, the French state holds a majority of shares in two firms that promote arms exports of French defense equipment (DCI, ODAS) (see Table 3.2). In contrast to Germany, SMEs in France are less relevant in the defense industry and family ownership is largely irrelevant. All in all, the transformation of the French defense industry has reduced total direct employment in the French defense industry from almost 250,000 in 1990 to 165,000 in 2014.

While state ownership has been reduced in general, the state retains a strong position within the French defense industry. Cross-participations between all defense prime contractors as well as export promoting firms continue to tie the different contractors together. What is more, the state continues to be at the heart of this highly intertwined, complex and stable sector – a system which French economists have dubbed the "French Meso-System of Armaments" (Serfati, 2014, p. 35). Figure 3.2 illustrates the central role of the state within the French defense industry.

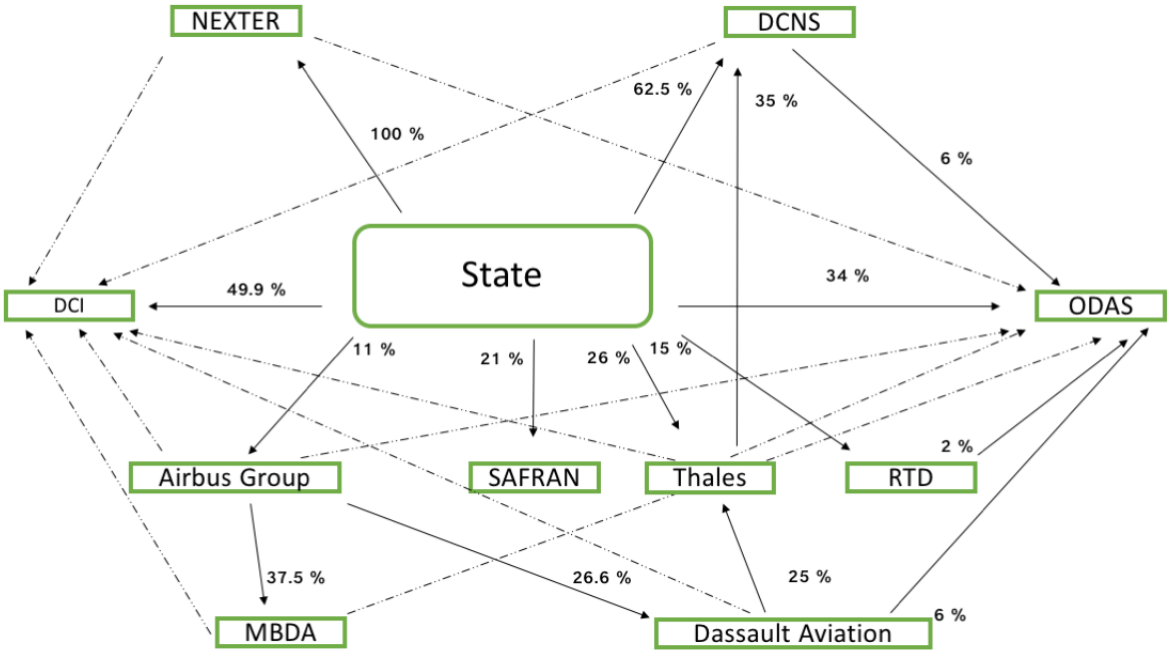
Table 3.2
French Defense Prime Contractors as of 2014: DCI: Défense Conseil International; RTD: Renault Trucks Defence

	Area of Activity	Turnover in bn. EUR (2014)	Employment (2014)	State Ownership (2014)
Multi-domain				
Thales[i]	Electronics (for Aviation and Naval Vessels)	7.61	33,292	26.1 %
Airbus Group[ii]	Aviation, Space, Missiles, Electronics, Drones (Trans-European)	10.9	7,650	11%
Safran[iii]	Aircraft Engines, Electronics (for Ground Weapons and Aviation)	5.25	40,746	21%
DCI	Services (Training of Foreign Armies' French-built Equipment)	0.24	909	50%
ODAS	Export Promotion and Implementation	0.5	100	34%
Ground Weapons				
Nexter Systems	Armored Vehicles, Artillery, Ammunition	1.01	3,324	100%
RTD	Armored Transport Vehicles	0.38	1,200	15%
Shipbuilding				
DCNS	Naval Ship Building	3.07	14,024	62.5 %
Aeronautics				
Dassault Aviation	Combat Aircraft, Drones	3.68	11,745	less than 3 % [iv]
Missiles				
MBDA	Missiles (Trans-European)	2.4	10,000	11%

Source: Author's compilation, data taken from Fleurant and Quéau (2014), DGA (2015), and APE (2015)

[i] Figures for France-based production and employment only. [ii] Figures for defense-related and France-based production and employment only. [iii] Figures for France-based production and employment only. [iv] French state interests represented by Airbus Group-delegated governors. French governments are consulted prior to every decision taken in the executive board.

Figure 3.2
Cross-Shareholdings and State Ownership in the French Defense Industry: *Note*: Percentage of ODAS and DCI shares held by Thales, Nexter Systems, Airbus and MBDA not publicly disclosed.



Source: Source: Author's illustration, based on data released by DGA (2015) and Dassault Aviation (2015)

3.2.5 Financialization in the French Defense Industry

With the aforementioned partial privatizations and transformation of former directorates into publicly floated corporations – both in the defense industry and in other sectors of the French economy – a working group appointed by Francis Mer, French Minister for the Economy, Finance and Industry, developed proposals that enable the state to efficiently exercise ownership (Barbier de La Serre et al., 2003, p. 4). This working group's task was to identify shortcomings in the "confusion of the multiple roles of the state" – as "shareholder" on the one hand and "sovereign", "client" and "planner" on the other hand. Moreover, according to the report of the working group, the state suffers from an information deficit vis-à-vis management, ambiguous objectives for the management and at times an "excessive presence of the state in the daily business"[19] (Bézard and Preiss, 2007, p. 601). In order to address these challenges, in 2004 the French state commissioned the newly founded holding agency *Agence des Participations de l'État* (APE) to manage all state interests in publicly traded corporations, including stocks of defense contractors. Put under the authority of the of Ministry of Finance with the objective

to "exercise the state's mission as a shareholder by supervising the state's assets"[20] (Décret n°2004-963, 2004), the creation of the APE altered state-industry relations – particularly those in the defense industry: instead of directing defense contractors through the technology-focused DGA, the French state developed a shareholder perspective – a role which also pays off monetarily. In 2014, firms from the defense and aeronautics sector distribute dividends back to the state budget amounting to half a billion EUR. This monetary payoff was the second largest distributor of dividends to the French state -– second only to the energy sector (APE, 2015, p. 38). In order to supervise industry activities, the APE seconds staff to defense contractor boards of administrators with state interests, thereby partly taking over the administrating role from the DGA. Remarkably, virtually all APE top civil servants supervising the shares of the French state in defense contractors are Sciences Po Paris and ENA-trained (APE, 2015, pp. 198-200) – and, therefore not part of the DGA-related École polytechnique group of civil servants. Nevertheless, delegated governors within executive boards of French defense contractors continue to be École polytechnique-trained and a delegated by the DGA – forming a relationship called "double trusteeship"[21] (Burtin, 2012). By and large, by giving the APE managing and supervisory powers over defense contractors, the state diminished the role of the DGA within the French defense industry and altered the relationship between business and government. Coutant Coutant (2014) interprets the rise of the APE as the ceasing of the state's traditional dirigiste administrative powers and its transformation towards a supervising "shareholder state". What is more, this development is interpreted by Coutant as a sort of financialization understood as the accumulation for the profit of finance, the rise of shareholder value in governance, and the diffusion of financial instruments and behaviors outside the realm of finance (Coutant, 2014, p. 4). Furthermore, in 2009 the French Ministry of Finance created the investment fund SOFIRED which targets defense startups, as a successor to the 2003 founded conversion fund SOFRED (see Section 3.1). This new fund was incorporated into the public investment bank BPI France in 2014, serving as another point for financialization in the French defense industry. However, with a volume of less than 45m EUR the scope of stock market investments in defense startups is still small, compared to traditional financing via subcontracts by defense prime contractors (Dumas, 2013). At the moment, it is difficult to foresee which role private and public equity funds may play in the future of the French defense industry.

3.2.6 Market-driven Consolidation in the United Kingdom

In the United Kingdom, consolidation in the defense industry started in the 1980s. Much like in France, the British post-war defense industry was marked by state ownership and "cold-war Fordism" (Lovering, 1990, p. 455). After a brief period of increased state control during the Falkland war, the Thatcher governments – in line with its "pro-market and anti-corporatist strands of economic policy" (Lovering, 1990, p. 458) – privatized all major defense contractors and refrained from interfering in mergers and acquisitions. Hence, the defense industry consolidated as smaller firms became frequent targets of hostile takeovers (James, 2000, p. 102). As a consequence, by the end of the Cold War, the majority of British defense contractors were acquired by the British Aerospace group. Ever since, British Aerospace has dominated the British defense industry and has become one of the world's largest defense contractors. This company was renamed *BAe Systems*, after British Aerospace opted to acquire the British electronics contractor GEC Marconi Electronic Systems instead of joining the trans- European EADS consortium (Agence France Press, 1999). In contrast to the French case, consolidation in the United Kingdom has been largely market-driven to the extent that various British governments refrained from intervening in merges and acquisitions across the Atlantic and allowed foreign ownership. Consequently, while the British defense industry continues to be active in European joint ventures, such as MBDA or the A400M program, it has lost its central position within the European defense industry largely to French firms and has – successfully – shifted towards the U.S. market.

3.2.7 Conclusion

What implications has the reorganization of the French defense industry had on the evolution of state-industry relations? First, by drastically reducing state ownership in the defense industry, the state gave up the most obvious administrating powers that had shaped the relationship between state and industry throughout the entire Cold War period. Consequently, once no longer majority shareholder, the state lost many of its interventionist traits in the defense industry and developed towards the model of a "shareholder state" (Coutant, 2014). Although partially sidelined by this development, the DGA has retained some of its influence in formerly state-held directorates now under the authority of the holding agency APE. Coutant shows that the role of the APE is constantly contested by the DGA which seeks to retain its influence through various channels, including through continuously working elite networks and by assigning funding for

RD (Coutant, 2014, p. 10) (see Section 3.3. In this context, one asks oneself why the French state decided to privatize its industry at all: First, increasingly loss making state-held defense contractors rendered the immediate post-Cold War situation less and less viable for the state due to the aforementioned budgetary pressure. Consequently, a consolidation of the French defense industry through privatization – be it national or European – was broadly accepted as necessary. This sentiment was particularly strong in the consistently unprofitable former directorates. even more the case in the constantly loss making former directorates. Second, looming integration of defense policy on the EU level and Europe-wide defense industrial consolidation was strategically embraced by the French state. This enthusiasm, albeit belated in comparison to the respective German and British consolidations, paved the way for mergers and acquisitions on the European level, which were orchestrated by the French state once national consolidation was completed. Moreover, European consolidation was complemented by France-sponsored European-level institution building, such as the creation of OCCAR and the EDA, as well as the granting of defense and security market-opening powers to the European Commission (Trybus, 2014). As a consequence, the French defense industry broadened its base within the still fragmented European market for defense equipment.

In summary, the French state is still influential when it sees its interests at stake as illustrated by its power to orchestrate a wide-ranging reorganization of the defense industry, and by the state's successful attempts in pushing personnel interests in Thales, Safran and the Airbus Group – even as minority shareholder. Moreover, the DGA seeks to retain some of its influence through its traditional elite networks. Consequently, the predictions formulated regarding the role of the state can be partly rejected: the state-orchestrated consolidation – first on the national, then on the European level, as well as influence over top management positions – shows how the state has kept some of its interventionist powers. What is more, by forging trans-European companies the French state expanded its sphere of influence from the formerly domestic defense industry to the European scale. This influence can be illustrated by the most recent example of the Franco-German KANT project and the French efforts to create a Franco-German-Italian shipyard under French dominance. However, financialization in the realm of the defense industry as represented by the rise of the APE in the governance of all defense contractors clearly marks a move towards a more liberal approach, as correctly predicted: In fact, the withdrawal of administrating powers from the DGA constitutes a fundamental shift from a state-direct model towards an enhancing-state as depicted by Schmidt. Furthermore, with regard to the predictions in the realm of business relations, Schmidt's predictions prove to be unfouded: Inter-firm relations are still

state-led and state-mediated, particularly in comparison the United Kingdom, as the French state remains an indispensable actor at the heart of the French Meso-System of Armaments.

3.3 Financing the Defense Industry through Research and Development Expenditure

As discussed in the previous section, the French state used to be the majority shareholder of many firms in the French defense industry and administered some of today's defense prime contractors – then still directorates – through the DGA. Another way of exerting influence in a research-intensive sector, such as the defense industry is the allocation of research and development (R&D) funding. Consequently, this section illustrates the evolution of a dirigiste system of state-based research towards a more arms-length system of state-financed research. Additionally, this chapter traces the increasing importance of R&D funding on the European level. In order to put the evolution of the French system of financing and R&D into context, a cross-country comparison with other major European defense industries, namely the British and the German industries, will be used.

3.3.1 Research and Development in the Defense Industry

In defense industries, research and development funding provided by the state traditionally plays a crucial role in financing both state-held and private defense contractors. In contrast to other industrial sectors where firms may dispose of ample alternative sources of funding, such as short-term capital markets or banks, the defense sector by and large lacks these sources (Belin and Guille, 2008): First, capital markets and banks may refrain from providing funding in a highly politicized business environment with strong state influence and regulatory instability and may even face regulatory restrictions. Second, R&D spending generally makes up a larger proportion of overall spending in the defense industry, as radical innovations play a crucial role for the defense industry. Due to the limited prospects of generating profits (at least in the short term) out of these innovations on a civil market, most capital markets in the relatively small European defense sector refrain from financing R&D without explicitly receiving purchase commitments by the state as the principal consumer (Bellais, 1999, p. 3). Consequently, R&D in the defense industry is generally funded by the state. Financing patterns have, however, evolved across national defense industries: In France the system of defense-related R&D has changed from a system with entirely state-directed research to a state-financed system. In the United

Kingdom, a formerly mostly state-directed system of defense-related research changed towards a more capital market-based system, albeit with large parts of the funding originating from the British Ministry of Defense and, most notably, access to the U.S. defense market. Germany is more reluctant to directly finance defense-related R&D. Nevertheless, fundamental research is carried out extensively in public universities and state-financed research institutes. In contrast to France, in these two countries banks and – to a lesser degree – capital markets provide the bulk of funding for defense-related R&D.

3.3.2 France

In the case of France, the defense procurement agency DGA acts as a research agency, and consequently, is at the heart of the system of R&D funding. Nevertheless, the DGA's role as a research agency has continuously evolved since the end of the Cold War. Originally the Research and Technical Studies Directorate (*Direction des Recherches et des Études Techniques*, DRET) within the DGA carried out in-house research with a staff of 55,000 in 1995 (Dussauge and Cornu, 1998, p. 36). This arrangement was criticized as a cost-inefficient and overly technology-driven approach — even by the left-leaning newspaper *L'Humanité* that identified the high R&D expenditures of the DGA as the prime reason for "over-armament" (L'Humanité, 1994). The 1996 reform of the DGA dissolved the DRET directorate and drastically cuts funding for in-house research facilities (Serfati, 2008, p. 78). Consequently, the DGA's direct research budget was reduced and its role changes profoundly. Henceforth, the DGA has acted as an allocator of R&D funding to external research agencies and defense contractors. In order to retain its influence, the DGA seeks to strengthen its position in fundamental research by establishing close ties with all major French research facilities, i.e. as the atomic research agency CEA, the space and aeronautics research CNES, the aeronautics research agency ONERA, and the national research agency CNRS (Belin and Guille, 2008, p. 33). Furthermore, in order to support the incentive for technology-intensive firms to self-finance investments in R&D, in the early 1980s French state created the so-called credit impôt recherche (CIR), a tax rebate system for R&D (Mulkay and Mairesse, 2013, pp. 749-751). In 2008 a reform of the CIR system drastically increases tax rate cuts such that the volume of the CIR system skyrocketed from less than 1 bn. EUR in 2005 to more than 5 bn. EUR in 2014 (Blein, 2014, p. 57), making the French system one of the most generous tax subsidies for R&D in OECD countries (see Figure 3.3). The reform of the tax rebate system generously supported self-financed R&D of defense contractors and, as stated by Gilbert Font of the aeronautics and defense interest group GIFAS,"improves [their]

competitive position"[22] (Font, cited by: Les Echos, 1997, p. 245). A parliamentary report by the National Assembly considers the CIR system on of the most favorable system for R&D in the world (Chabanne and Foulon, 2014, p. 59). Consequently, French defense contractors seem to spend more of their revenue on self-financed R&D than average German defense contractors – in addition to the large volume of French state-financed R&D.[23] Furthermore, in the mid-2000s, at a time when institution building in the Common Security and Defence Policy (CSDP) of the EU was at its climax, the French state and the DGA became a driving force behind the proposition to include defense-related R&D into the EU's multi-annual Framework Programmes for Research and Technological Development (abbreviated FP1 for the first program through FP8 for the current program). In 2006, the French defense minister Michèle Alliot-Marie campaigned across EU-countries for a 200m EUR fund that would be managed by the recently established EDA – a proposition that met criticism both from her British counterpart and the British defense contractor BAe Systems, who feared that France would benefit disproportionately (Financial Times, 2006). After extensive lobbying by DGA chief Lureau (Anderson, 2006), and heavy criticism from British and German Public – albeit for different reasons – the FP7 for the period 2007 – 2013 for the first time included security-related research funding worth up to 1.3 bn. EUR. The present FP8 for the period 2014 – 2020 has used this approach and finances so-called dual-use research for both military and civilian purposes. Discussions about a specific European defense research program within the FP9 for the period 2021 – 2027 with a potential volume of 3.5 bn. EUR are still ongoing (European Defence Agency, 2015; Fiott and Bellais, 2016). Overall, beneficiaries of the vast amount of French and European R&D funds are primarily large defense prime contractors. Various attempts to strengthen the position of SMEs, inter alia through particular SME targeted research funding by the DGA and the creation of the interest group "Comité Richelieu" (La Tribune, 1994b; Le Monde, 1997), remain without success: By 2013, French SMEs receive only four percent of all state orders of defense equipment and a meagre one percent of all public R&D funds go directly to SMEs (Serfati, 2014, p. 141). As a consequence, SMEs in the French defense industry have increasingly turned to capital marked-based financing mechanisms (Belin and Guille, 2008). In summary, the 1996 reform reduced the role of the DGA from an omnipotent research facility to that of a coordinating research financing and oversight body. Nevertheless, R&D is still largely carried out by public institutions and supervised by the DGA, which has maintained considerable technological expertise. The role of the DGA mirrors the role that scholars of comparative research policies: in many ways, the DGA remains the core of a "mission-oriented" (Ergas, 1987) research system aimed at technological excellence

with state-defined goals.

3.3.3 United Kingdom

In the case of the United Kingdom, until the late 1990s the government research agency *Defence Evaluation and Research Agency* (DERA) carried out the bulk of defense-related R&D on behalf of the British Ministry of Defense. In contrast to the French case, the DERA was never a part of the British defense procurement agency DPA (now DE&S) which generally lives an arm's length relationship with the British defense industry. Hence, even initially, the DPO was significantly less powerful in directing the defense industry than its French counterpart (DeVore and Weiss, 2013, p. 510). Around the turn of the millennium, the British government decided to split and privatize DERA as *QinetiQ* which became a publicly traded research contractor on the London stock exchange (Fontanel and Pilandon, 1992, p. 16). A report by the British National Audit Office finds that towards the end of the 1990s, budgetary pressures had decreased R&D funds for DERA in a way, that technological advancement was no longer viable (National Audit Office, 2007, pp. 11-12). Consequently, faced with the two options – i.e. privatization through a public-private partnership (PPP) arrangement or stripping the DERA into several smaller agencies – privatization was deemed the most cost-efficient alternative. Through acquisitions in the U.S. market and increases of capital, the 2001-founded QinetiQ managed to raise private investor money to make up for the reduction in public R&D expenditure (National Audit Office, 2007, p. 32). Much like in France, the United Kingdom offers a system of tax rebates for private R&D expenditures, although significantly smaller in size than the French equivalent. In summary, the British system of coordinating R&D changed from a state-directed system towards a more liberal, arms-length approach. The formerly state-owned research agency was privatized and the British Ministry of Defense lost considerable expertise. Thus, today the British defense-related R&D system more closely resembles the general political-economic institutional framework of the United Kingdom.

3.3.4 Germany

In the case of Germany, the state offers significantly less direkt financial support for defense-related R&D. Several smaller research agencies are part of the German Ministry of Defense and report directly to the different branches of the German Military. In addition, the German state-owned research organization Fraunhofer Society conducts defense-related R&D on behalf of the German Ministry of Defense. Nevertheless, privately owned defense contractors

play a significantly larger role, as the Fraunhofer Society's R&D is partly financed through a cooperation with German and trans-European defense contractors. Hence, generally speaking, the German defense industry relies more heavily on self-financed defense-related R&D (Masson, 2010, pp. 72-73). What is more, in line with the general institutional framework of the German political economy, i.e. a large proportion of bank-based financing (Goyer, 2007), the defense industry generally relies to a larger degree on bank-based financing rather than on state-based financing or capital market-based financing. Only two out of the ten largest defense contractors (the trans-European Airbus Group and Rheinmetall Defence) are part of the largest and most traded equity funds, while all German defense contractors are financed primarily by German banks, including private banks, savings banks, and state-owned regional banks (Facing Finance, 2016, p. 18). Furthermore, in contrast to France and the United Kingdom the German state subsidizes in-house to a lesser degree, as there is no tax rebate system for privately-funded R&D expenditures in Germany. In summary, the German state offers considerably less funds for defense-related R&D. Consequently, defense contractors rely more on cooperatively-financed R&D, or turn to banks rather than capital markets for financing. Figure 3.3 illustrates the different amount of tax rebates for private R&D in the six largest European defense industries.

As illustrated above, the systems of financing R&D differ fundamentally in the largest European defense industries. Not surprisingly, public expenditure for defense-related R&D is significantly larger in France than in all other European countries. In the United Kingdom, financing public expenditure for defense-related R&D has plummeted as a formerly state-financed system has given way to a capital market-based system (see Table 3.3).

3.3.5 Conclusion

What implications does this evolution of the R&D financing system have on the French defense industry and its evolution of state-industry relations? While, generally speaking, the French state has given capital-markets are more prominent role in the political economy (Goyer, 2007), financing in the defense industry works differently than in other industrial sectors. The principal buyer of defense equipment and the traditional principle provider of R&D funding the French ministry of defense and the DGA continue to be indispensable actors. However, the role of the DGA in allocating R&D funds has changed. Rather than conducting research itself, the DGA has shifted towards the model of a planning agency for industrial policy. Consequently, François Lureau, a former head of the DGA, described the DGA's way of conducting industrial policy through expertise guided planning and funding of research as an "investment approach rather than an buyers approach"[24] (Lureau, 2004). Thus, in line with the findings from the previous

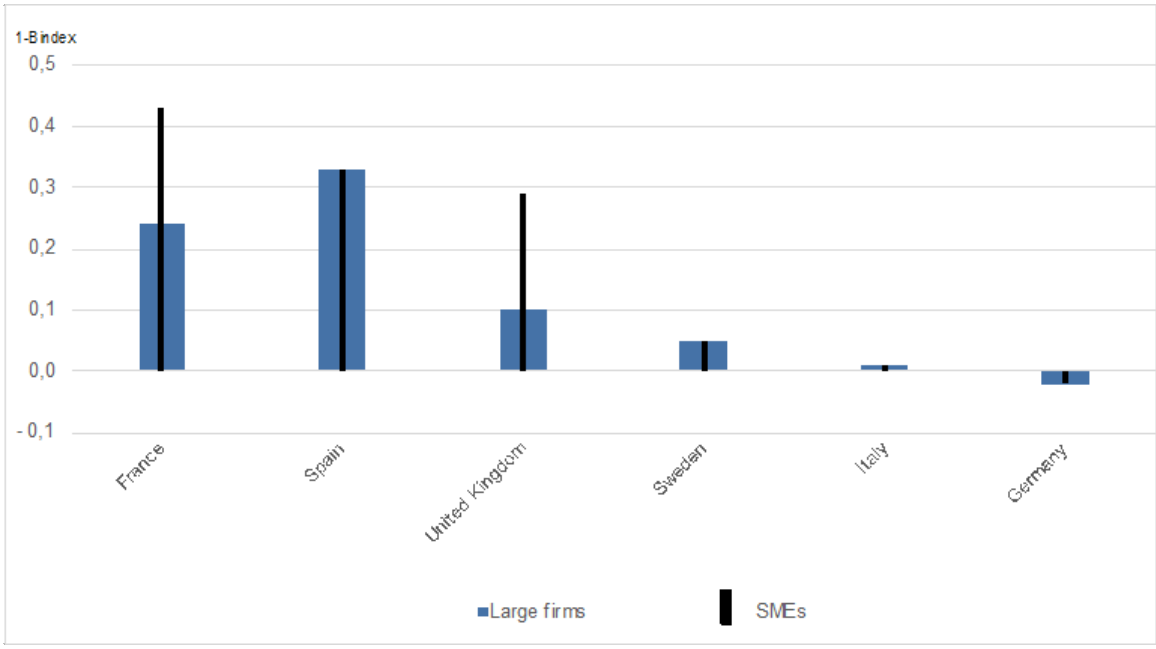
Table 3.3
Public Expenditure for Defense-related R&D and Percentage of total R&D in Selected Countries

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
France	Defense-related (in bn. EUR)[i]	3.6	3.8	3.2	3.3	3.7	3.6	3.3	3.4	3.3	3.6	3.5
	of total Government R&D (in %)[ii]	25%	26%	21%	20%	22%	22%	21%	21%	20%	-	22%
Germany	Defense-related (in bn. EUR)[i]	1	1	1.2	1.2	1.1.	1.4	1.1	0.9	0.9	0.8	1.1
	of total Government R&D (in %)[ii]	6%	6%	7%	6%	6%	7%	5%	4%	4%	-	6%
Italy	Defense-related (in bn. EUR)[i]	0.1	0.2	0.3	0.3	0.1	0.1	0.2	0.1	0.2	0.1	0.2
	of total Government R&D (in %)[ii]	1%	3%	4%	4%	1%	1%	2%	1%	2%	-	2%
United Kingdom	Defense-related (in bn. EUR)[i]	3.7	4	4	3.2	2.8	2.9	2	1.6	1.8	2	2.8
	of total Government R&D (in %)[ii]	44%	46%	44%	35%	28%	29%	20%	18%	18%	19%	30%

Source: Author's compilation.

[i] Figures taken from European Defence Agency (2015). [ii] Figures taken from OECD (2015).

Figure 3.3
Tax Rebates for Private R&D in Selected Countries: *Note*: The 1-B indicator calculated by the OECD specifies tax support for R&D expenditures through before-tax income needed by an average firm to break even. International comparability may be limited. For a detailed description of the indicator and a discussion of comparability, see: http://www.oecd.org/sti/rd-tax-incentive-indicators.htm (30 September 2016).



Source: Source: Author's illustration based on OECD (2015).

section, the state's role in general and the DGA's role specifically has changed from being an active and interventionist part of the French defense industry towards a state-enhanced system – a finding that corresponds with the predictions based in Schmidt's typology. However, the French state is still an indispensable actor in financing defense-related R&D and, thus, influential in comparison to other European states vis-à-vis their respective defense industries. Nowhere in the six largest European defense industries is public funding for R&D and financing in general as important as it is in France. Moreover, the French state remains influential in setting national political economic priorities and firm autonomy is weak. These findings mirror the study by Ergas (1987) on varieties of research policies, as the French state has kept its mission-oriented approach in the realm of defense. Hence, the predictions regarding the principal source of funding can be partly rejected for the French defense industry. In allocating a stable and ample source of RD funding, the French state continues to provide the conditions for technological excellency.

3.4 Export Promotion in the French Defense Industry

Arms exports are conventionally regarded as a politically delicate and highly controversial issue. Often confronted with public criticism, most western states prefer to draw as little attention as possible to export deals. In contrast, both the French public and the French defense industry have historically embraced exports of defense material as a means of ensuring its global political influence and for enabling armament programs which otherwise would not have been possible with the French state as the sole buyer of its defense industry. Arms exports had been an integral part of Gaullist foreign policy to exert influence in countries from the NAM group. What is more, exports of defense equipment had also been an important part of industrial policy since the reform of the French defense industry, as de Gaulle and the DGA regarded an exports-production ratio of 35 percent as indispensable for a viable, autonomous and powerful French defense industry with potential spin-offs towards the civilian aeronautics sector (Comité pour l'Histoire de l'Armement, 2002). For this purpose, the DGA had been tasked as the principal body to promote arms exports. Consequently, export shares in the French defense industry have historically been high compared to other European countries (Serfati, 2014, p. 195), as the DGA was quite successful in promoting exports that accounted for close to five percent of all French exported goods and services throughout these "golden decades" (Hébert, 2006, pp. 14-15). However, by the end of the Cold War, as French arms exports became politically less attractive for the NAM group, exports figures began to shrink and aggravate the crisis of the French defense industry. By the early-1990s, the French share in global arms exports plummets from fifteen percent in the 1980s, to ten percent and further aggrevated by loss incurring export deals with Saudi-Arabia that attracted harsh criticism (Hébert, 2010, p. 44; Serfati, 2001, p. 225). Hence, this chapter illustrates the role of the state within the system of French arms exports. We will claim that – even in comparison with historical records and other European states – the French state plays an indispensable role in promoting French arms exports, particularly during the negotiation phase of export contracts and by long-term financing of arms exports through a generous system of state-backed export credit guarantees.

3.4.1 The Reform of the French Arms Export System

As a consequence of plummeting export figures and loss incurring export deals, more and more voices demand a reform of the arms export promotion system. In 1996, the former Minister for Trade, Bruno Durieux, prepared a report on behalf of the Ministry of Defense that called for an

"inter-ministerial strategy to support French arms exports"[25], i.e. a standing body which grants governmental permission to and facilitates arms export contracts (Le Figaro, 1996b).[26] Furthermore, Durieux called for an end of hostile competition between French defense contractors which had become apparent in the early 1990s, when Dassault Aviation and Aérospatiale competed for several arms exports to South-East Asian countries – ultimately loosing the contract to Russian defense contractors (Le Monde, 1993). In April 1997, then-Defense Minister Charles Millon announced a strategic plan in the French National Assembly, declaring that all future arms exports shall be guided by three principles (Le Figaro, 1997b): (1) they must not threaten the French Military's security of supply; (2) they must respect international agreements; and (3) they must avoid to destabilize local or regional balances of power. Furthermore, Millon announced a geographical concentration of arms exports towards four regions; the Middle East, South-East Asia, Latin America and Europe. In 1997, Millon reformed the so-called *Commission Interministerielle pour l'Étude des exportations des Materiels de Guerre* (CIEEMG), the inter-ministerial body tasked to permit arms exports and chaired by the French Prime Minister, and limited the CIEEMG's longest delay for decisions on arms exports to one month. Furthermore, the DGA lost the *Direction des Affaires Strategiques* (DAS) – the preparatory body for CIEEMG's decisions on arms exports – to the personal office of the Defense Minister. In order to give French arms exports a competitive edge, Millon appointed Bruno Durieux as CEO of the state-dominated but publicly traded *Défense Conseil International* (DCI) – which from this point forward was to play a key role in facilitating arms exports. The DCI is composed of formerly independent export promotion companies set up within the framework of arms exports to Saudi Arabia, Qatar and Egypt, offering military training by former French military personnel for buyers of French-built defense equipment – a clear advantage vis-à-vis other European competitors (Tran, 2010). Other than facilitating arms exports through the aforementioned approach, the creation of DCI marked a new development in intra-firm relations in the French defense industry – all relevant French defense contractors are partial shareholders of the DCI while the French APE acts as majority shareholder (see Figure 3.2). In contrast to the immediate post-Cold War period, when hostile competition between French defense contractors inhibited arms exports, today French defense contractors actively cooperate in the principal export regions identified by Millon. Virtually all French defense prime contractors participate in region-specific export promotion consortia, namely ODAS for the Middle East and SOFEMA for South-East Asia and Latin America. Nevertheless, the DGA remains an important actor of the French arms export systems. Notwithstanding the shift from purely state-directed export

promotion to the incorporation of industry, in a report issued by the French Senate, the DGA's sub-division DGA/DI (International Development) is referred to as the "control tower" of export promotion (Chabanne and Foulon, 2014, pp. 43-44):

1. In the acquisition phase, the DGA plays a crucial role in promoting French defense technology by organizing French stands to national and international military equipment shows. Furthermore, the DGA is represented by a military attaché within all major French diplomatic delegations and embassies and is, thereby, in direct contact with foreign governments and militaries.

2. In the negotiation phase, the DGA sub-division DGA/SMQ (Central Service of Modernization and Quality) acts as warrantor and contact hub in assuring and informing foreign governments of the quality of French defense equipment.

3. In the realization phase of an export contract, the DGA is in charge of giving technical assistance to foreign customers of French defense equipment. Furthermore, the DGA establishes the contact between foreign customers and the French export credit insurance company COFACE.

Consequently, the Director of DGA/DI is commonly referred to as a "super-vendor" (Challanges, 2012). As the coordinating body between state and defense-industry, the DGA/DI is uniquely positioned in the central agency for facilitating arms exports. What is more, it arranges French state-backed export guarantees by setting up customer contact with the French export insurance company *Compagnie Française d'Assurance pour le Commerce Extérieur* (COFACE). COFACE plays a crucial role within the French system of armament exports. Created in 1948 as a state-held export insurance company, it was privatized in 1994 and in 2006 became a 100 percent affiliate of the private investment bank Natixis. Nevertheless, export insurances continue to be backed by state guarantees (Chabanne and Foulon, 2014, p. 53). In total, almost one fourth of all state-backed French export credit guarantees originate from defense equipment (see Table 3.4.1). A cross-country comparison with the United Kingdom and Germany illustrates that both in absolute and relative terms defense-related export credit guarantees issued by COFACE are remarkably high.

In comparison with France, the British and the German state offer comparably little support for arms exports: There is no specifically arms export-targeted agency, such as the DGA in France. In line with the general export framework, arms exports are promoted at an industry

Table 3.4
Government Backed Export Credit Guarantees and Defense Equipment Thereof in Selected Countries

		2008	2009	2010	2011	2012	2013	2014	Ø
France[i]	Total (in bn. EUR)	42.1	52.6	59.2	63.9	63.9	42.1	61.4	55.0
	of which defense-related (in %)	16 %	28 %	24 %	25 %	25 %	24 %	25 %	23.9 %
Germany[ii]	Total (in bn. EUR)	19.9	24.3	27.7	31	32.7	33.4	36.3	29.3
	of which defense-related (in %)	-	7.7 %	0.1 %	8.1 %	10 %	3.6 %	3.1 %	5.4 %
United Kingdom[iii]	Total (in bn. EUR)	1.8	2.6	3.4	2.7	5.1	2.7	3.2	3.1
	of which defense-related (in %)	1 %	1 %	4 %	1 %	47 %	1 %	5 %	8.6 %

Source: Author's compilation.

[i] Data taken from Chabanne and Foulon (2014, p. 54). [ii] Data taken from BMWi (2015) and *Bundestag Drucksache 17/14756* (n.d.). [iii] Data taken from UK Export Finance (2015) and UK Export Finance (2012).

level, mostly through interest group-based institutions, such as chambers of commerce or at industry-organized trade fairs. The interest group *Bundesverband der deutschen Sicherheits- und Verteidigungsindustrie e.V.* (BDSV) and its subsidiary *Gruppe Wehrtechnischer Messen e.V.* (GWM) organize the German contribution to international arms trade fairs. However, they receive less support by German politicians – at least in the public sphere. Much like in France, however, export insurances in Germany are issued by the Euler Hermes SA, a private sector bank and 100 percent affiliate of the Deutsche Bank – and backed by the German Federal Government. However, these export credit guarantees, the so-called *Hermesdeckungen*, are not comparable to French export credit guarantees, neither in quantity nor in the share of defense equipment. The United Kingdom counts on a state-directed export promotion system. The Defence Export Services Organisation (DESO) promotes arms exports in the name of the British state. Moreover, arms exports from British defense contractors can be backed by a governmental agency, the Export Credits Guarantee Department (UK Export Finance). However, the quantity of guaranteed export credits both in total and the ratio of defense equipment thereof is significantly lower in the United Kingdom than in France and in Germany (see Table 3.4.1). In contrast to the case of Germany and to a lesser extent the United Kingdom, exports of defense equipment structurally play a crucial macroeconomic role in France as they make up a larger

chunk of general exports. Of all economic sectors, the defense industry is the largest positive net contributor to the French balance of trade. Defense equipment exports counterbalance the negative French balance of trade by on average of about 9.2 percent – a considerably larger proportion than in other European defense industries (see Table 3.4.1).

Table 3.5
Net Positive Effect of Arms Exports on Foreign Trade Balance:
Effect on Trade Balance computed by dividing Net Arms Exports by Net Trade Balance

		2008	2009	2010	2011	2012	2013	2014	Ø
France	Effect on Trade Balance	6.6 %	6.6 %	5.6 %	11.2 %	16.7 %	12.5 %	5.2 %	9.2 %
	Net Arms Exports (in bn. EUR)	4.5	3.7	3.7	10	13.7	9.5	3.8	
	Net Trade Balance (in bn. EUR)	- 68	- 56	- 66	- 89	- 82	-76	-72	
Germany[i]	Effect on Trade Balance	2.0 %	3.6 %	3.1 %	3.4 %	2.4 %	2.9 %	1.8 %	2.7 %
	Net Arms Exports (in bn. EUR)	5.7	5.0	4.7	5.4	4.7	5.8	3.9	
	Net Trade Balance (in bn. EUR)	178	139	154	157	192	199	216	
United Kingdom	Effect on Trade Balance	1 %	2.9 %	2.1 %	5.6 %	1.6 %	5.8 %	1.9 %	2.8 %
	Net Arms Exports (in bn. EUR)	1.3	3.4	2.8	7.0	2.7	5.2	2.6	
	Net Trade Balance (in bn. EUR)	- 126	- 118	- 132	- 124	- 173	- 90	- 139	

Source: Author's compilation, based on figures taken from EEAS (2016) and Eurostat (2016).

[i] Germany applies a narrower definition of defense exports resulting in slightly smaller figures.

However, French arms exports not only enjoy considerable financial and logistical support, they also receive strong domestic political support. While arms exports traditionally receive less political support from other European governments, French top politicians proactively help

arrange export deals and publicly back export deals during state visits. In all major export deals over the past decade, industry officials have publicly praised the proactive role of French presidents and defense ministers. Accordingly, the chairman of the French National Assembly's defense committee, Guy Teissier, highlights the role of the French President as "a sign of interest for the visited state which can immensely contribute to a success of the negotiations"[27] (Teissier, 2011). When interviews regarding an export deal of combat aircraft with Brazil, Charles Edelstenne, CEO of Dassault Aviation, conceded that "it was Nicolas Sarkozy, not us, who sold the Rafale"[28] (Le Monde, 2009). Likewise, experts attributed the selection of the "historic" submarine deal in April 2016 in favor of DCNS to the active and consistent lobbying by French defense minister Jean-Yves Le Drian and President François Hollande (Le Monde, 2016).[29]

Despite this support, arms exports control is weak when compared to Germany or the United Kingdom (Mölling, 2013). Besides the relatively simple economic explanation, Béraud-Sudreau (2014) argues that the French presidential system does not offer small leftist parties – traditional opponents of arms exports – access to decision-making. What is more, according to Béraud-Sudreau, the argumentative discourse of France's "grandeur" offers French governments an argumentative vehicle to justify arms exports. As Krotz (2002, p. 30) shows, in France it is widely accepted that "selling arms is an intuitively plausible interest for an active-independent collectivity with ambitions of global presence" and that "selling arms abroad is a normal and legitimate source of income". Béraud-Sudreau (2014, p. 87) shows that actors in favor of a stricter export control, such as the Green party and Human Rights activists, could not gain political capital out of the 2011 Arab spring uprisings, when former dictatorships, supported by French arms exports, where toppled.

3.4.2 Conclusion

What implications has the reform of the French arms export system had on the evolution of state-industry relations in the French defense industry? First, the export crisis in the 1990s pressured the French state to proactively engage in the promotion of arms exports. Consequently, in order to facilitate arms exports and reduce bureaucratic efforts needed, the state streamlined technocratic decision-making in granting exports by reducing the role of the DGA in the export permission process. Moreover, the creation of the publicly-traded export promotion bureau (ODAS) and the training agency (DCI), encouraged private defense contractors to jointly facilitating arms exports. Thus, the predictions by the theoretical framework regarding

state-industry relations can be partly confirmed. The state. represented by the DGA, ceded some administrative powers and involved business, represented by private defense contractors, in export promotion. However, compared with the United Kingdom and Germany, the French state is remarkably active when it comes to promoting arms exports. High ranking French politicians are routinely involved in promoting arms exports, and even the DGA has retained a key role in coordinating the different steps of the export process. Moreover, the state offers considerable financial support in backing export credits issued by COFACE, particularly in comparison with the United Kingdom and Germany. Lastly, the predictions regarding inter-business relations can be partly rejected, as inter-firm relations in the export realm were pacified through the creation of DCI and ODAS, in contrast to the early 1990s, when defense contractors competed for export deals. Today, these former rivals successfully cooperate with one another, together with the French state.

4 Conclusion

This thesis examined the evolution of institutional frameworks in the French defense industry. Building on predictions formulated from the theoretical framework, the ramifications of the evolution of the capitalist model of the French defense industry will be discussed.

First, regarding the role of the state towards business and labor, the analyses have produced mixed results. While the 1996 reform introduced a more liberal, market-based approach in line with H1, the state-orchestrated consolidation on the national European level, as well as influence over top management positions, shows how the state has kept some of its interventionist powers. What is more, through forging trans-European companies, the French state – in a way – has expanded its sphere of influence from the formerly domestic defense industry to the European scale. The most recent example of this influence can be seen in the Franco-German KANT project, and the French efforts to create a Franco-German-Italian shipyard under French dominance. However, financialization in the realm of the defense industry as represented by the rise of the APE in the governance of all defense contractors clearly marks a move towards a more liberal approach, as predicted by the theoretical framework. Moreover, the state ceded some of its administrative *dirigiste* powers and involved business, represented by private defense contractors, in export promotion. All in all, through taking away some of the administrative powers from the DGA, the state traded a state-directed system for a state-enhanced system. However, particularly in comparison with Germany and the United Kingdom, the French state remains where and when it sees its vital interest at stake.

Second, in the realm of business relations, the study has mostly produced evidence contradicting the predictions formulated on the basis of the theoretical framework: Inter-firm relations are still largely state-led and state-mediated as the state remains an indispensable actor at the heart of the "French Meso-System of Armament" (Serfati, 2014, p. 35). Furthermore, as defense-related R&D is still overwhelmingly state-financed, the French state remains influential in setting national political economic priorities, and firm autonomy remains weak. Lastly, the study of the evolution of institutional frameworks in the realm of export promotion illustrated how inter-firm relations – at least in the export realm – were pacified through the creation of DCI and ODAS.

Third, in the realm of industrial relations, the analysis has produced evidence supporting the

predictions of the theoretical framework: The French state cushioned layoffs and the weakening of labor unions through decentralization of employer-worker relations by the introduction of state-financed early retirement schemes and vocational rehabilitation plans. Thus, in the realm of industrial relations, the defense industry resembles the overall French economy.

Getting back to the research question, the study has produced seemingly contradictory results. As the French defense industry is partly organized along institutional frameworks that were characteristic for post-war dirigisme (namely in the realm of business relations and to a certain degree in the realm of state-industry relations) and at the same time, resembles institutional frameworks prevalent in today's state-enhanced model, the answer rests with the particularities of the defense-industrial sector. Investments in defense-related R&D typically require large time horizons and defense markets are still protected from international pressures to a degree unprecedented in other sectors. Moreover, arms exports are negotiated in a highly politicized environment, where state support means almost everything. Thus, evidence produced in this thesis points to a vital role of institutional frameworks for the economic performance of the French defense industry. The French defense industry enjoys strong state support where it is indispensable, by socially cushioning rationalizations in the consolidation phase, by orchestrating otherwise impossible mergers and acquisitions at the European level, and by financing long term research projects. In other realms, the French state has adapted to the changing international environment in granting defense contractors more independence, and through fostering more efficient organization of work procedures in mostly publicly-traded defense contractors. In summary, evidence from the empirical chapter supports the notion that institutional frameworks allow the French defense industry to strive and economically outperform its European counterparts. As anticipated by Schmidt (2003, p. 549), French defense contractors have an advantage vis-à-vis German or British counterparts, as they enjoy considerably more public support – both financially via defense-related R&D expenditure, logistically during the important consolidation phase as well as through institution building at the European level.

What broader implications can be drawn from this analysis? First, as much as categorizations and ideal types contribute to a theoretical understanding of the political economy, they nonetheless require constant refinement. Schmidt's *state-enhancing* model of capitalism may be valuable in illustrating the evolution of institutional frameworks in the French economy in general. However, when it comes to the study of a specific economic sector, political-economic institutions can differ significantly. In the French defense industry, institutional frameworks are still largely state-directed, albeit with traits of an enhancing state. Hence, Serfati's notion of the

French defense industry as "one of the last building blocks of French capitalism" (Serfati, 2001, p. 235) is still valid today as large parts of the institutional framework that had been shaped by de Gaulle in the post-war period continue to survive until today. Second, findings on the strategic consolidation of former state-owned French defense contractors at the European level mirror Clift's recent work on *post-dirigisme* in French state-banking industry relations (Clift, 2014). Here, too, in an economic sector where state ownership and control had been historically strong, the French state vigorously pursued privatization while, at the same time, retaining significant influence. This influence manifests itself through "deeper inter-penetration of public and private elites" (Clift, 2014, p. 581) in the French banking sector and was then strategically used for "international champions advancement" at the European level in the wake of the financial crisis. Third, this strategic consolidation at the European level is in line with work by (Irondelle, 2003) who identified French military reforms throughout the 1990s – before CSDP institutions had been set up at the EU level – as a form of "Europeanization without the EU". More recent work by Hoeffler shows that the strategic positioning of French defense contractors in the European arena can be interpreted as a partial shift from strict "economic patriotism", as defined by Clift and Woll (2012), towards a post-national, European sphere (Hoeffler, 2012, p. 446). Hence, from a European integration theory perspective, the case of the strategic consolidation at the European level could serve as an example of "bottom-up Europeanization", i.e. the uploading of national preferences towards the EU level (Börzel and Panke, 2016). However, for now defense industrial policy is to a large extent formulated at the national level or through intergovernmental institutions, and is only gradually influenced by EU institutions. Fourth and lastly, the case study of the French defense industry may serve as a proof that political and societal actors are capable of shaping political-economic institutions against what is widely perceived as an irresistible pressure from globalization. This influence invokes the notion of French national security and allows the French state to keep an institutional framework that, in many ways, resembles the post-war dirigiste model and continues to conduct industrial policy in the name of national security to this day.

One aspect of the thesis that has to be mentioned critically is the suitability of the theoretical framework. Despite providing a useful backbone for steering the analysis, the typology of Schmidt (2003) aims primarily at covering the entire French political economy. Thus, when applied to the French defense industry, the approach disregards particularities, namely the strong resilience against business cycle fluctuations due to long time horizons of policy making in this field and the prevailing national priorities by French governments. However, we intended to make

up for these shortcomings by touching upon the surprisingly different institutional frameworks of defense industries of similar states and, by illustrating that the aforementioned particularities are indeed a feature of the French model – be it *dirigiste*, *post-dirigiste* or simply *state-enhanced*.

Notes

[1]In this paper I use the term *defense industry*. Other scholars prefer to use the term *armament industry* or *arms industry*, both of which have no distinctly-defined meaning. A clear definition of what is meant by defense industry in this thesis will be presented below.

[2]The term pantouflage originates at military engineering school École polytechnique, where one group of graduates preferred slippers (French: pantoufles), i.e. a civilian career, over boots, i.e. a military career, and is deeply entrenched both and the civilian political-business sphere and the defense industry.

[3]Author's translation from French: "La préoccupation de coût doit être au cœur de ces choix comme dans tout rapport industriel entre un fournisseur et ses clients".

[4]Author's translation from French: "Un de mes buts sera [...] que [l'industrie de défense] assimile la culture d'optimisation des coûts du secteur concurrentiel".

[5]Author's translation from French: "L'arrivée [...] doit servir d'électrochoc pour hâter les restructurations industrielles".

[6]Author's translation from French: "Il faut lui montrer que tout n'est pas acquis, que s'ils ne sont pas capable de fournir dans les délais et les coûts nous irons ailleurs".

[7]Author's translation from French: "Les réformes des politiques d'acquisition [...] ont donné lieu à un retour des militaires [...] par une civilianisation de leurs pratiques".

[8]Author's translation from French: "La DGA était devenue un véritable ministère dans le ministère".

[9]Author's translation from French: "Même si elle n'a pas bouleversé les équilibres existant entre les différents protagonistes des politiques d'armement, elle a contribué à une interarmisation de la formulation des besoins militaires et à une ouverture plus grande des industriels à des logiques commerciales".

[10]Author's translation from French: Ils [les syndicats] considèrent qu'elle [la privatisation] constitue 'une première étape positive', et pouvait etre un choix (qu'ils) soutiendront."

[11]Author's translation from French: "Il faut procéder d'abord aux regroupements sur une base nationale. Mais ces regroupements n'ont pas un sens que s'ils s'inscrivent, dans une seconde étape, dans une perspective européenne."

[12]Author's translation from French: "Pour résister à la concurrence mondiale, l'État doit aider les entreprises françaises à acquérir une taille européenne. Il faut commencer par conforter les entreprises nationales ; puis favoriser leur regroupement avec des partenaires européens"

[13]The Lagardère Group withdrew from the defense industry in the late 2000s and concentrated its shareholdings in the media sector.

[14]Author's translation from French: "Denis Ranque sait désormais qu'il 'n'échappera pas à une opération industrielle voulue par l'État' ".

[15]Author's translation from French: "En décidant de conserver Aérospatiale dans le giron public, le gouvernement devrait lancer de nouvelles opérations de restructuration".

[16]Author's translation from French: "L'Etat a donc trouvé le moyen de privatiser en douceur Snecma tout en 'nationalisant' un peu Sagem".

[17]Author's translation from French: "C'est alors que la France fit le choix a délibéré d'une politique en faveur de la coopération européenne".

[18]Art. 346 TFEU specifies that, whenever matters of national security are involved, EU member states can invoke an exception from transparency and competition rules that apply in the internal market.

[19]Author's translation from French: "[...] une présence souvent excessive de l'État dans leur gestion quotidienne."

[20]Author's translation from French: "L'agence exerce, en veillant aux intérêts patrimoniaux de l'Etat, la mission de l'Etat actionnaire."

[21]Author's translation from French: "L'APE et la DGA exercent une double-tutelle"

[22]Author's translation from French: "il contribue à la maîtrise des coûts salariaux sur nos sites français et à l'amélioration denotre compétitivité".

[23]Over the past ten years, French firms spend on average roughly 7 percent (8.7 percent for Safran, 5 percent for Thales, while German firms spend only 6.5 percent (9.5 percent for Diehl Defence and 3.4 percent for Rheinmetall Defence) on self-financed R&D. However, due to the small sample, these figures have only limited validity.

[24]Author's translation from French: "Notre approche est celle d'un investisseur et non d'un acheteur."

[25]Author's translation from French: "Bruno Durieux appelle l'État à 'mettre en œuvre un plan stratégique interministériel des exportations d'armement' "

[26]It is noteworthy that the debate did not focus on means of restricting arms exports, but – quite the contrary – at facilitating arms exports and increasing sales of French defense equipment.

[27]Author's translation from French: "De plus la présence du chef de l'État est, pour l'État visité, le signe d'un intérêt politique fort à son encontre, qui peut largement contribuer à l'aboutissement de négociations."

[28]Author's translation from French: "Mais c'est Nicolas Sarkozy qui a vendu le Rafale, ce n'est pas nous."

[29]It is noteworthy, that French Ministry of Defense' arms export reports to the French National Assembly resemble flashy sales promotion brochures celebrating French technology and excellency rather than neutral reports on export figures, as e.g. in Germany and the United Kingdom

A Appendix

Table A.1
Career Path of Top DGA Civil Servants. First column indicates period of service as head of DGA.
BoG: Board of Governors; ECAN: Naval Arms Test Directorate ; EDM: École des Mines; ENS: École Normale Supérieur; IFREMER: French Research Institute for the Exploitation of the Sea; PSA: Groupe Peugeot Société Anonyme; GDF: Gaz de France; OCCAR: Organisation Conjointe de Coopération en Matière d'Armement; X : École Polytechnique

		Academic Background	Career Path (In Chronological Order)
1961-1966	Gaston Lavaud	X1919	Army General, Chief of General Staff, Head of DMA, Retirement
1966-1968	Michel Fourquet	X1933	General of the Air Force, Secretary General, Head of DMA, Chief of General Staff
1968-1973	Jean Blancard	X1933	Professor at EDM, Ministry of Industry, CEO of SNECMA, Head of DGA, Head of Public Energy Department, CEO of GDF
1973-1977	J-L Delpech	X1960	Sciences Po, CEO of Schneider, Renault, Head of DGA
1977-1983	Henri Martre	X1947	DGA, Head of DGA, CEO of Aérospatiale, GIFAS, Member of the executive board of Renault
1983-1986	Émile Blanc	X1954	DGA, Headof DGA,CEO of SNECMA, CEO of SNPE, executive board of Dassault Aviation
1987-1989	Jacques Chevallier	X1940	ECAN, CEA, Chief of Staff of Defense Minister André Giraud, Head of DGA
1989-1993	Yves Sillard	X1954	DGA, IFREMER, Head of DGA, NATO Space Division
1993-1996	Henri Conze	X1958	DGA, Head of DGA
1996-2001	Jean-Yves Helmer	EDM 1970	PSA, Head of DGA, Consultant at Lazard (Investment Bank)
2001-2004	Yves Gleizes	X1963	ENS, DGA, Head of DGA
2004-2008	François Lureau	X1963	DGA, Thomson-CSF, CEO of Thales, Head of DGA, Ingénieurs et Scientific de France
since 2008	Laurent Collet-Billon	ENS	DGA, Advisor to Defense Minister of André Giraud, DGA, Administrator of OCCAR, CEO of Alcatel, Head of DGA

Source: Author's compilation, based on École polytechnique (https://www.polytechnique.edu/bibliotheque)

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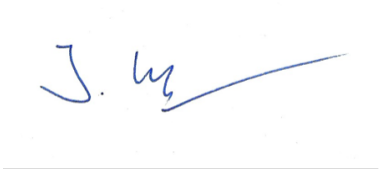

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