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1. Background

- 1 Western economies have been going through a deindustrialization process in the last decades although in a discordant way having different outcomes for different economies and sectors. Compared to the previous period with relative stability, the accord between the government policy and corporate action that maintains high-end, high-productivity manufacturing which in turn sustains high-wage employment opportunities to keep Western national economies prosperous has been degrading for some time. For scholarly research, this weakening accord represented by the loss of high road jobs, faltering employment levels and slowly eroding competitiveness of Western economies calls for a renewed theoretical perspective to guide government policy that seeks to restore high value-added industrial employment with positive multiplier effects for the rest of the society.
- 2 The background concern of this analysis is linked to this phenomenon and it searches for an answer if aerospace industry has been immune to this disruptive process which has had highly negative consequences for the households of these economies. In light of this fact, this dissertation analyzes the dynamics of long-term suc-

cess in commercial aircraft manufacturing in the US and Europe, performed through a historical-comparative methodology employed for firm level analysis. Namely for the two major companies of each region, Airbus and Boeing.

2. Method

- 3 The study follows the work of Chandler (1962, 1977) and Penrose (1959, 1960) and more recently Froud et al. (2006) and Lippert et al. (2014) in presenting detailed historical accounts of business firms in action, in the form of a comparative case study.
- 4 The main claim of this thesis is that an analysis strictly based on corporations' business and technology strategies is insufficient to give a clear picture of the orientations of their broader productive activities. For this reason, the thesis proposes the business/productive models analytical framework which focuses on not only the strategies related to technology development and supply chain organization but also the industrial organization of the companies investigated and the degree of their financial commitment to support innovation as a whole. In contrast to the technology literature which understands systems integration as a new form of capability to address the development and production of more complex and high-cost products having a systems character in the sense that they involve multiple technologies and collaboration between a large number of organizations (Hobday et al., 2005; Prencipe et al., 2003), this thesis investigates systems integration as a business/productive model which has important strategic, organizational and financial attributes. The nature of the systems integration orientation of both firms in the last two decades not only defines their reorganization of R&D and production activities in technology intensive industries, but also has important organizational and financial consequences. With a conceptual framework based on the productive models approach of the Regulation theory (Boyer and Freyssenet, 2000) and the theory of innovative enterprise proposed by W. Lazonick (2013), this study identifies distinct constructive and destructive processes of integration or disintegration strategies followed by Airbus and Boeing, with important roles attributed to the new orientations in finance and work organization/industrial relations in executing these so-called systems integ-

ration strategies. As a result, the strategy component of these two companies' business/productive models were complemented with the research on their organizational and financial structures.

3. Findings

- 5 The results of the research show a strong correlation between extensive outsourcing, financialization of business strategies and conflicting employment relations. Distinct constructive and destructive processes of corporate strategies of Airbus and Boeing are strongly linked to the role of the transformations of finance and work organization/industrial relations in the last three decades in Western economies. Throughout the study, the consequences of corporate action on the promotion of secure jobs with positive prospects for their respective economies are questioned and relevant implications are drawn for business and government policy.
- 6 The comparative case study of this thesis shows that the concerns over industrial relations and the protection of productive capabilities are critically important factors over strategic decisions of two firms in reshaping their map of productive capabilities. Part of their supply chain reorganizations for their latest aircraft programs, both firms extended their reach beyond advanced economies towards developing economies. There is an evolutionary process of capability development of suppliers primarily endorsed by Airbus and Boeing through their changing outsourcing and partnering strategies. However, in the case of partners from developing economies and primarily the Chinese ones, the support of their respective governments to support national aerospace capability development efforts largely complements the willingness of Airbus and Boeing to transfer more work to these emerging aerospace firms. For both firms, there is equally relevant evidence of integration and disintegration depending on their highly normative understanding of the term systems integration. Especially in investments related to soft businesses like electronics, IT or services, the definition of systems integration is highly ambiguous as both companies invest and divest in these domains simultaneously. Compared to Airbus' much more active strategy to enlarge and contract its boundaries through a higher number of acquisitions, divestments and investments out of its home countries,

Boeing's investment strategy is largely restricted to the US while its outsourcing is much more highlighted in terms of geographical dispersion compared to Airbus.

- 7 Employment relations are strained with mounting concerns of employees over job security and long-term employment opportunities on both sides of the Atlantic. Such concerns are also expressed in the declining interest in aerospace of the potential labor force especially in the US. Conflictual relations with employees, lack of sound communication channels between the management and labor force and flexible work schemes are received with mixed reactions by the labor force of both firms. However, degrading practices of work in the systems integration period are not equally highlighted in two companies. Certain aspects of the model like leveraging over stakeholders to extract gains through managing flexibility and conflict resolution have different forms with different types of tensions created among labor force. These differences remind the critical role of institutional structures in giving a certain character to the forms of industrial relations and work organization.
- 8 Finally, financial motives are also as important as organizational inclinations in giving shape to strategic decision-making of both firms. Utilizing government support and retained earnings as the most important sources of financing innovation and value creation documented in detail, these two companies have so far employed different value extraction practices expressed in their different levels of shareholder value distribution. However, the orientation towards shareholder value maximization characterizes both firms, but is much stronger in the case of Boeing with massive amounts of share repurchases and dividend payments and the rapid rise of stock-based executive compensation in the last two decades. Financialization has deep roots in the company. Compared to Boeing, Airbus has followed a balanced strategy, mitigating conflicting interests up until the present day. Despite outsourcing 50% of its latest aircraft program A350 and divesting several business units as a part of its cost-cutting programs, the tension with the workforce and massive distribution of shareholder value have so far remained under control. However, its most recent discourse and shareholder value distribution practices provide some evidence that a more financialized business strategy is

on the way. The concerns of the workforce over job security are also on the rise.

- 9 Detailed evidence throughout the study suggests that systems integration à la Boeing and à la Airbus are harmful to their long-term competitive capabilities, and neither of the two companies is immune to the perils of financialization and deteriorating employment practices. The future course of their actions will have important implications for the future of aerospace and commercial aircraft manufacturing in their home countries. None of the firms currently has an ongoing aircraft development program other than derivatives and upgrades of existing programs. This means that they are going to enter a head-to-head competition with two or more other firms in the following decade in smaller aircraft segments with their upgraded narrow body aircraft. It is this segment which they generate a great bulk of their cash inflow critically necessary to fund future development programs.

4. Conclusion

- 10 The main conclusion drawn from the research around this framework is that the history of organizational success of both firms is still being written by their deliberate actions and decisions over the extent of their productive organizations. Differing and resembling features of systems integration orientation of two firms are built on their highly normative understanding of the term through varying degrees of outsourcing, integration, disintegration and internationalization in various segments of commercial aircraft manufacturing in particular and aerospace in general. In addition, the strategic decisions they take and their functional results which are sometimes controversial in different times and spaces help to identify the strong relation between *knowing* and *doing* innovation. These actions also contain the endless efforts of two firms to change their technological and industrial boundaries in order to keep their positions as the most innovative aerospace companies of their regions, if not globally.
- 11 While the developments of the previous period turned the commercial aircraft manufacturing into a global duopoly in civil aircraft segments and an oligopoly in defense aerospace, the future is set for another global overhaul of commercial aircraft manufacturing and

aerospace. In that context, the future of Western aerospace is strongly linked to the future of general Western industrial and manufacturing success. The increasing role of the product markets such as the rise of Asian markets, colossal costs of product development, the massive knowledge base required and technological and organizational skills for ever complex products, make the long-term future of the industry in the US and Europe even more uncertain.

- 12 The research shows that the sustainability of Western industrial and manufacturing success cannot solely depend on the extent of government policy and its effectiveness in supporting sustainable industrial growth. No innovation or industrial policy can be successful without concordant corporate practices focused on innovation and capability development.
- 13 The audacity of humankind throughout the 20th century beginning with the Wright Brothers' successful flight and the educating failures of many other aviation enthusiasts has now become restricted to corporate decision-making increasingly motivated by financial returns. Yet societies are in need of more efficient, cleaner and less costly air transport as they need more innovative drugs, safer and ethical food sources, and a better livelihood. Today's efforts to research and develop new technologies will determine the character of the livelihood in future decades which basically depends on the current level of investments in education, training and career development of younger generations.

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