

The political economy of aerospace industries. A key driver of growth and international competitiveness? by Keith Hartley, Cheltenham, Edward Elgar, 2014, 288 pp., £80 (hardback), ISBN 9781782544951

This book provides an insight into the economic forces shaping innovation and technological change in the global aerospace industry. Driven by heavy subsidies from governments in advanced countries, the aerospace industry is still considered vital for the economic specialization and growth of national economies. With its high technology status and driven by very long innovation cycles, this industry is responsible for technological spillovers. However, the core economic argument behind subsidizing the industry has been that markets are insufficiently prepared to generate adequate funding for innovation. Therefore, there is a rationale for governments to intervene and provide sufficient funding to stimulate technological change. Such justification of government intervention is heavily criticized by the author of this book. He shows that many decisions in the industry are actually political in nature, rather than based on economic reasoning. Political decisions have an impact not only on the development of the military aerospace sector, but also on the civil aerospace industry. The author develops his argument by providing an overview of the history and the current market of the global aerospace industry. He examines the economics behind the industry and its structure. Finally, he provides an overview of the political forces shaping the industry and puts them into international context. In the final chapter, Hartley develops some visions of the future of the aerospace industry.

In putting the aircraft industry into historical context, Hartley reveals an emerging industry with a short history of only about 100 years. Hartley discusses the origins and early development of the industry, characterized by great individual inventors and single investors providing sufficient funding for innovation. During World War I, governments became very active in the sector as aircraft were considered vital for war. After the war, the industry shrank amidst much merger. During World War II, however, aircraft were again considered important in the battlefield, and the industry grew enormously. With the end of World War II and the beginning of the Cold War, the civil aircraft market began to grow and the industry retained its size.

Since 1945, the sector has been characterized by industry consolidation affected by different merger and acquisition waves, and government response in terms of privatization or nationalization (depending on the political climate), and rapid technological change driven by high development costs. Aircraft acquisition costs [which are part of the life cycle costs, including research and development (R&D) and production costs] now account for between 20 and 50% of the total costs of an airplane. Increasing acquisition costs have been a major driver in the industry for greater and greater scale economies. Based on monopoly supply or sometimes duopolistic structure (with firms competing with very similar products in military and/or civilian markets), civilian aerospace markets are close to 'normal' (mostly duopolistic) markets with many private buyers. Military markets are still dominated by government buyers.

But even if the civil aerospace market can be seen as a normal market, governments still often intervene by attributing great importance to the industry's high technology, its ability to generate jobs for highly qualified personnel, and the possibility of technological spillovers. As aerospace companies are often in need of large amounts of cash to start new projects that is not available in private capital markets, governments are often asked to finance this initial investment. Government

assistance for Airbus was vital for the development of the sector in Europe. Airbus was founded from firms in three European countries and is supported by the national governments in Germany, France and the United Kingdom. In the World Trade Organization, battles have taken place to examine whether state aid has been used illegally. So far, all firms have been acquitted of wrongdoing. The rationale behind the state aid is that, for example, the industry will provide jobs for highly qualified personnel and will generate technological spillovers. However, these effects have been difficult to quantify. In addition, there is no evidence that these technologies would not have developed in the absence of government support.

To demonstrate the politics involved in the military market, the author uses a case study of BAE Systems. British Aerospace (BAe) was founded in 1977 by a merger between two nationalized airframe firms. After privatisation, the firm diversified into other defence businesses, such as air, sea and land systems. In 1999, the purchase of Marconi Electronic Systems led to the formation of BAE Systems. The firm also expanded into other geographical areas, such as the United States, Australia and Asia. Since the 1990s, the firm has focussed on military technologies and services. Most of the time the British government had a 'buy UK' policy, which meant that only firms located in the UK were allowed to receive a contract to provide military equipment. This produced a situation in which 41% of the UK's Ministry of Defence (MoD) expenditure went to BAE Systems, and 20% of BAE's sales were to the MoD.

Hartley then examines the case from a public choice perspective – assuming that the political processes are driven by the self-interest of the actors involved, with politicians aiming for re-election requiring support from their voting constituency. As military aerospace markets are very complex, the decisions governing this market are left to politicians. With the MoD interested in a bigger budget and politicians in their own re-election, firms often do not have to bear the risks of a new project as this constellation provides sufficient leeway to underestimate the costs and timeframe of a project. If costs are overrun and the project experiences delays, the responsible minister at the MoD has probably already been replaced by a new minister. In addition, the government's sunk investment is already so high that the project cannot be stopped. Hartley then examines whether the aerospace market actually should receive government subsidies. Governments argue that the aerospace industry needs to be supported for several reasons, mainly because the aerospace industry generates highly qualified jobs and technological spillovers to other companies. However, the additionality is rarely questioned. Almost all countries involved in the aerospace sector are guilty of providing state aid to the industry.

In the last part of the book, Hartley covers the process of buying military aircraft. He studies first the options to buy or develop aircraft within a country, and then focuses on the option of involving home country firms in a network of international collaborators. For the purchase of a military aircraft, there are multiple options, ranging from development by national firms or buying off the shelf. Buying such planes off the shelf involves lower risks and cost advantages, but the buyer becomes dependent on other countries for aircraft delivery and maintenance, which can be problematic in case of conflict. Furthermore, a national company could license a design from elsewhere and then build the plane domestically, which is a more expensive, but also more secure option. Another option is to use only national firms to build the plane, which results in all the knowledge necessary being generated within national borders. The choice is largely a political one.

A compromise between building a plane within a country and buying it on international markets is to develop it in cooperation with firms in other countries. Firms could then benefit from scale effects and share development costs. This would lead to keeping the knowledge gained within the countries involved in the cooperation. However, collaborations among firms from different countries introduce additional costs. Furthermore, the distribution of work within such international firm collaboration is often determined more by politics than by considerations of efficiency. The best example of an international collaboration in the aerospace industry is Airbus, which is based on a long-term collaboration with an established organization covering three different European countries. Most other collaborations are restricted to single projects and suffer greatly from the costs of political influence.

Hartley gives an insight into the politics of an apparently efficient industry. Using different frameworks, such as the SCP-model and the public choice perspective, he shows that political influence in the aerospace industry is vital to drive development. These frameworks complement each other and are useful in characterizing the difficulties in the industry – the complexity of the market with duopoly suppliers in civilian markets and government monopsony in military markets and voters having very limited knowledge of the sector. Hartley concludes that the industry will see more mergers in the near future and that firms will have greater bargaining power *vis-à-vis* governments. He postulates that aircraft development will become even more expensive and that national governments will struggle to pay the costs.

In questioning the reasons for state intervention in the aerospace industry, Hartley calculates the social benefits. He examines the costs of development, production and maintenance of different aircraft (the Typhoon, the Gripen and the Rafale) and links these to the social benefits resulting from technological spillovers to other companies. The calculations produce great variety in social spillover. The author values the spillover from the Typhoon at between €9 billion and €51 billion. Another problem with the calculation of these costs and benefits is that it is unknown whether these technologies would have been developed otherwise. Hartley also shows that civilian and military aerospace are largely related to each other and that decisions affecting military aerospace markets are mainly political in nature. The author suggests that fewer countries should be involved in collaborations, but also that countries might not want to be dependent on other countries for their military supply. He leaves ample room for debate on how important the industry is for a country and how much subsidy it should receive.

The Political Economy of Aerospace Industries does not cover collaborations between research institutes and firms. It neglects the role of public research institutes, such as NLR in The Netherlands and the European Space Agency, and the interaction of companies within the sector. Some appreciation of the knowledge the aerospace industry derives from these institutes would have provided more context to the political decisions taken by governments.

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