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The Aircraft Manufacturer Construcciones Aeronáuticas SA (CASA), 1939-1972: Resilience and Adaptation to Spain's Defense Policy and International Relations

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ABSTRACT
This article aims to explain the resilience of the aircraft manufacturer Construcciones Aeronáuticas SA (CASA) after the Spanish Civil War and how the company adapted to the autarky policy and interventionism of the early Franco regime and, subsequently, to Spain's economic, technological, and military dependence on the United States. It argues that CASA's adaptation strategy had the effect of reducing the company's capacity and expertise, thus conditioning its development starting in the mid-1960s. In order to do so, it retraces the company's evolution and specialization from the 1940s until its late incorporation into European projects, around 1970, and discusses the political and institutional factors that explain this trajectory.

KEYWORDS: resilience, adaptation, aircraft industry, Franco regime

JEL CODES: L62, N44, N64, N74

1. Introduction

Prior to the outbreak of civil war in Spain, the Spanish company *Construcciones Aeronáuticas S.A.* (CASA) manufactured German, French, and British-designed aircraft under license. However, during the Franco dictatorship, the company became increasingly distanced from aircraft manufacturers elsewhere in Western Europe. Beginning in the mid-1950s, following the arrival of the first airplanes provided by the United States in Spain, CASA's focus shifted away from designing and manufacturing aircraft and aircraft components and towards manufacturing parts for other industries.[1] Due to the lack of aircraft orders, the company had no choice but to focus on working for growing industries – mainly, manufacturing parts for the automobile industry. At the same time, CASA began to maintain and service American aircraft, which allowed it to expand its expertise, get up to date with the latest technology, and keep one foot in the industry despite the drastic reduction in the number of aircraft orders from Spain's Ministry of Aviation (*Ministerio del Aire*), which had previously been its primary customer. The Franco regime's policies of autarky and interventionism and the actions of the National Institute of Industry (*Instituto Nacional de Industria*, INI) in the 1940s and,

[1] Following the Pact of Madrid, the modernization of Spain's armed forces, and particularly its Air Force, was closely linked to aid from the United States until the late 1960s (Sánchez 2006; 2019; Pérez 2009; Sabaté 2015; Delgado 2019; León 2019).

subsequently, the 1953 Pact of Madrid with the United States were the factors that determined CASA's evolution and specialization up until the mid-1960s. In the late 1960s and early 1970s, CASA began to collaborate with companies from European Economic Community member states in the manufacture of airplanes, on the one hand, and equipment for use by the European Space Research Organisation (ESRO), on the other, albeit with a significantly lower share in these projects than its European peers (Catalán 1995; Sánchez 2006; 2019).

The analytical framework of organizational resilience serves as the basis for this article's main hypothesis. It will be argued that the path of specialization taken by CASA allowed it to adapt and be resilient in the face of the shocks and disturbances of the 1940s and 1950s. However, while the company experienced significant growth during this period, the strategy it adopted also had the effect of reducing its aircraft design capacity and expertise and placing it in a situation of significant technological dependence, which limited the possible paths it could take beginning in the mid-1960s. To demonstrate this hypothesis, this article will examine CASA's adaptation to political and institutional changes (particularly Spain's defense policy and foreign relations) from the end of the Spanish Civil War until it began to work closely with the European aircraft industry in the early 1970s.

The existing literature on CASA is limited.[2] The company's founder, José Ortiz Echagüe (González and López 2020; Erro 2012; San Román 2000), has been the subject of biographies that provide information about CASA's origins and the entrepreneurial spirit and network of this businessman and former military engineer. These biographical studies mention CASA's principal milestones but do not contain any in-depth discussion of how the company evolved over time and was impacted by political and economic change. The amount of attention given to CASA in existing works about the INI varies considerably. The most extensive treatment can be found in San Román (1999)'s book about the origins of the INI, which includes an entire chapter about the aircraft industry, and particularly CASA, as well as a section of another chapter. However, it focuses primarily on the INI becoming a shareholder in Spain's most important aircraft manufacturers and its plans for these companies. Other well-known studies mention the INI's holdings in the aircraft industry only briefly (Martín Aceña and Comín 1991; Gómez Mendoza 2000). Also pertinent to the study of the aircraft industry and CASA is research on diplomatic, military, and political aspects that looks at the training and modernization of the Spanish Air Force (Delgado 2019; 2021; León-Aguinaga 2019; Delgado and León-Aguinaga 2018; Sanz 2019). In this vein, León-Aguinaga and Delgado (2018) refer to the launch of the Offshore Procurement Program (OSP) and the Facilities Assistance Program (FAP), which allowed CASA to provide maintenance services to the USAF in the 1950s and 1960s. Sánchez (2019) has examined relations between French and Spanish aircraft manufacturers using the case of the sale of Mirage III aircraft to Spain, which led to

[2] The non-academic literature includes commemorative books published by CASA itself, such as that published on the occasion of the company's 75th anniversary, written by José María Román Arroyo (1998).

increased collaboration between CASA and the French aircraft industry (particularly AMD). Because these studies draw primarily on sources from diplomatic and military archives, they do not discuss the history of CASA in depth.

The aim of this article is not to discuss public enterprises and the INI during the Franco dictatorship using CASA as a case study. Rather, it is to use organizational resilience theory to analyze the company's evolution from the end of the Spanish Civil War until it began to work closely with the European aircraft industry. With regard to primary sources, this article draws primarily on company papers housed at the *Archivo Histórico del Banco Bilbao Vizcaya Argentaria* (AHBBVA), the historical archives of the major Spanish bank BBVA. Banco de Bilbao and Banco de Vizcaya, which merged in the late 1980s, were CASA's main shareholders in 1940, before the INI became a shareholder and overtook them in 1943.[3] These sources have been contrasted and complemented with information about CASA found in the historical archives of the *Sociedad Estatal de Participaciones Industriales* (SEPI), successor to the INI. With regard to CASA's collaboration with ESRO, there are 14 files on rocket and satellite projects from 1968 to 1972. Given that several of the authors cited above have worked extensively with diplomatic and military sources housed in other archives, these secondary sources have provided information that complements the documentation from business archives consulted for this paper and provides context regarding the evolution of the industry in other European countries.

2. Organizational resilience: anticipation, coping, and adaptation

CASA's evolution during the period examined here makes for an excellent case study of organizational resilience. There is growing interest in the topic of resilience in both academia and business in view of the need to deal with crisis situations and increased emphasis on risk management. In addition to studies focused on large organizations, there has been an increasing amount of work on medium-sized enterprises (Zhou et al 2022; Iborra, Safón, and Dolz 2020; Pal, Torstensson, and Mattila 2014). Resilience can be defined as "an organization's ability to anticipate potential threats, to cope effectively with adverse events, and to adapt to changing conditions" (Duchek 2020, p. 220). Shocks including emergencies, macroeconomic fluctuations, and structural changes in the economy can have a large impact, even leading to the destruction of the organization if it does not effectively anticipate, cope, and adapt to these disturbances (Evenhuis 2017; Duchek 2020). This approach looks at multiple dimensions of an organization and is particularly relevant in changing political, economic, and social environments because, rather than focusing exclusively on internal resources, it also analyzes the organization's interactions with the environment in which it operates.[4]

[3] This documentation includes annual reports, balance and profit and loss accounts, information about meetings of the board of directors, and correspondence, mainly between Víctor Chávarri (member of the Banco de Bilbao and CASA boards) and his cousin Ortiz Echagüe (chairman of CASA).

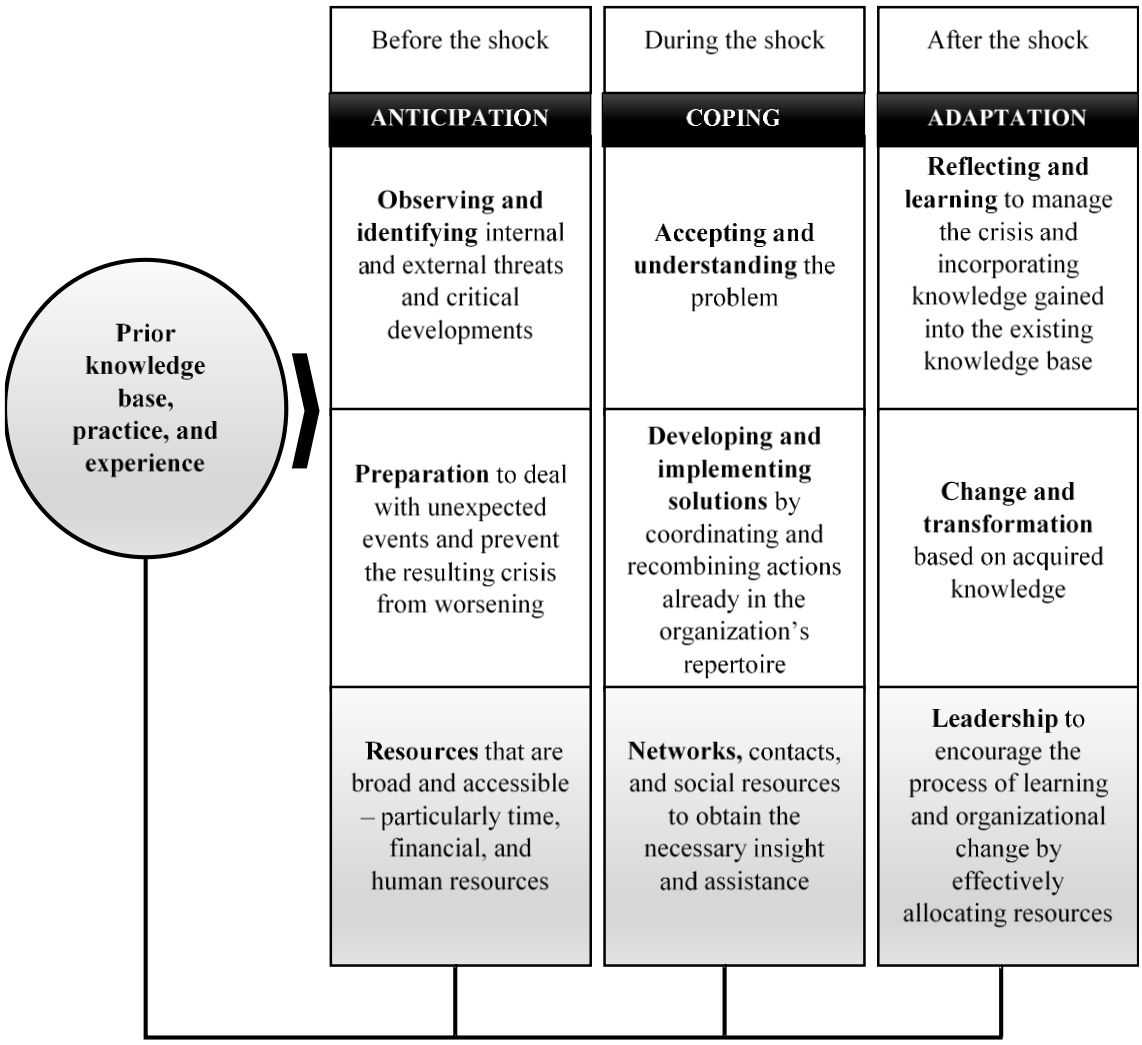
[4] Organizational resilience, used to study organizations, and particularly businesses, is a concept that originated more recently and is slightly different than territorial and production system resilience, which is

Successfully dealing with shocks requires creativity and innovation. That is, it requires the capacity to make use of both external and resources and effective leadership that allows new knowledge to translate into new behaviors when the organization is on the brink of collapse. In this respect, the resilience capacity of an organization can emerge only from latent potential gained through experience. Following this perspective, organizational resilience is understood in this article as a process that can be divided into different stages in which a combination of capacities and routines allows shocks to be overcome (**figure 1**). Resilience means responding to shocks before, while, and after they occur. This process can be divided into three stages tied to three resilience capabilities: 1) anticipation; 2) coping; 3) adaptation (Duchek 2020). Anticipation is defined as the ability to observe and identify critical developments and threats and, insofar as it is possible, be prepared to deal with shocks, recognizing early signs to prevent the crisis from worsening. This preparation can be developed by expanding general knowledge and available resources, and by generalized control over them (Duchek 2020; Serrat 2017). Coping refers to the ability to deal with shocks when they have already become manifest. To successfully cope with shocks, it is necessary to accept the problem and develop solutions. To accept reality, organizations must be aware of their own limits and the environment in which they operate. Developing and implementing solutions involves recombining actions that are already in the organization's repertoire in new or even improvised ways to deal with the shock. Adaptation means adapting to critical situations using two types of capabilities: reflection and learning and change and transformation. The greater an organization's adaptive capacity, the less vulnerable it will be in the face of shocks (Duchek 2020; Dalziell and McManus 2004).

Adaptation that pursues short-term economic efficiency can have a detrimental effect when it comes to dealing with major changes and events in the medium and long term (Brunsdon and Dalziell 2005). Even improvisation, problem-solving, and creativity arise from an existing foundation. Adaptation capabilities depend, to a certain extent, on continuity in the personnel, facilities, and equipment involved in production, but they also require training and practice to maintain capabilities and investment in organizational learning to broaden them (Winter 2003, pp. 991-95). Overspecialization (for instance, in certain products and/or markets), lack of planning, and the loss of capabilities as a result of restructuring processes increase the vulnerability of organizations (Brunsdon and Dalziell 2005). It is important to differentiate between resilience and mere survival, particularly when discussing public and semi-public enterprises, because governmental involvement may allow the short-term survival of organizations that prove incapable of adapting to change in the long term. What happened at CASA in the period discussed in this paper is an example of resilience, rather than mere survival, though the company's adaptation to changing circumstances came at a cost.

the concept commonly used in evolutionary economic geography (Evenhuis, 2017), as well as in some studies in economic history (see, for instance, Valdaliso 2020).

FIGURE 1. Organizational resilience



Source: Own work based on Duchek (2020) and Serrat (2017).

The organizational capabilities underlying the three stages of organizational resilience depend on several preexisting factors and characteristics. Authors such as Serrat (2017) and Duchek (2020) largely coincide in identifying these factors and characteristics. According to Duchek, certain main antecedents affect all three resilience stages. These include the organization's knowledge base, the extent of which is a determining factor in the three resilience stages. This author also underscores three drivers. The first driver is resource availability, including that of human and financial resources, as well as time. This is fundamental to developing organizational resilience. Social resources, understood as the social capital of the organization and its networks, constitute the second driver. The third driver is power and responsibility, because cognitive processes, learning, and capabilities are tied to power relationships within the organization. Leaders can both encourage and hinder processes of learning and change. Serrat maintains that an organization's resilience depends on three primary characteristics: leadership, which defines its adaptive capacity; networks, understood as the cultivation and development of internal and external relationships that can be leveraged when needed; and preparation

(the author's term is change readiness), which is planning and direction to make the organization adaptable to change.

These studies provide the framework that will be used in this paper to analyze CASA's resilience in the face of the political and institutional shocks that marked the company's evolution. Organizational resilience will be understood here as a process divided into stages in which anticipation, coping, and adaptation capabilities, as well as several other factors and qualities – namely, the organization's prior knowledge base, resource availability, networks, and leadership – are needed to successfully deal with shocks.

3. CASA's origins and situation after the Spanish Civil War: autarky, interventionism, and the Ministry of Aviation

3.1 Foundation and early years

During the First World War, airplanes were widely used and became a modern weapon of war. Wood slowly gave way to metal as the primary structural material, and aircraft technology rapidly advanced in the years following the war (Gómez and López 1992; Pecker and Pérez 1983). In 1923, during the Golden Age of Aviation, a group of Spanish military officers decided to found CASA to meet the aircraft needs of the Spanish armed forces. The company had a starting capital of 1,500,000 pesetas. The following year, CASA opened a factory in Getafe, the first in Spain capable of manufacturing metal aircraft. In 1926, at the height of the seaplane boom, the company opened a factory in Puntales, in the province of Cádiz, to meet the needs of Naval Aviation.

By 1931, 90% of the aircraft used by the Spanish armed forces was manufactured in Spain. Until July 1936, CASA manufactured airplanes designed by the French manufacturer Breguet, the British manufacturer Vickers, and the German manufacturer Dornier Flugzeugwerke under license (**table 2**). Both Vickers and Breguet held shares in CASA. The expertise gained from manufacturing aircraft under license led the Spanish company to attempt to develop its own light aircraft in the late 1920s (No author 1948; Román 1998, pp. 32-67; Martín Aceña and Comín 1991, pp. 223-24).

During the Spanish Civil War, the factory in Getafe, which remained in Republican hands, was moved to Catalonia. The factory in Cádiz was left in the hands of the insurgents, who had the support of CASA's main shareholders. Because it was the only factory in rebel territory, its facilities were adapted to supply German-designed aircraft to the insurgents. To this end, José Ortiz Echagüe, a military officer and CASA's chairman and founder, travelled to Germany to negotiate a number of manufacturing licenses (Erro 2012; González Cascón and López 2020, pp. 224-26).[5] However, because the insurgents needed to obtain aircraft ready for use in the war as quickly as possible, these plans were

[5] Some literature on the Spanish Civil War discusses arms shipments and sales (Viñas 1984; 2008; 2020; Leitz 1996; Howson 2000; Moradiellos 2001).

put off in favor of acquiring German-manufactured aircraft (San Román 1999, pp. 262-74).

3.2 The years of the Second World War

Following the Civil War, the plans of the Ministry of Aviation and the INI's first president, Juan Antonio Suanzes, led CASA to go to significant lengths to avoid being nationalized. These efforts were partially successful in limiting the INI's stake in the company (San Román 1999, pp. 133-39; Gómez Mendoza 2000, p. 65). In 1938, during the war, CASA had started building a new factory in Tablada, in the province of Sevilla, with an annual production capacity of 300 wooden propellers, 100 trainer aircraft, and 120 bombers, in accordance with the requirements of the Nationalist air force. Sevilla was chosen for both military and political reasons. First of all, given that it was a military-related industry, the new facilities had to be located far from the coast. Secondly, areas where conflicts might arise were ruled out (San Román 1999, pp. 268-85; Martín Aceña and Comín 1991, pp. 223-24). The Cádiz factory, due to the absence of seaplane programs following the war and its location near the coast, was relegated to secondary work, primarily manufacturing parts for CASA's other factories and trainer aircraft. The Getafe factory's facilities were renovated to build and assemble large aircraft.[6] The escalating situation in Europe made it advisable to set up a program to manufacture all kinds of military aircraft in Spain and make an effort to do so as quickly as possible. Although it initially appeared that there would be steady demand from the Spanish government, this was not the case. The Ministry of Aviation made inconsistent and changing demands and promises that it failed to keep (Nadal 2020, pp. 259-60, 310).

Despite the difficulties stemming from the war, the international ostracization imposed on Spain, and the Franco regime's autarky policy, CASA was able to obtain the technical support it needed to begin manufacturing German aircraft under license during the first years of the Second World War (Sanz 2019, pp. 106-8). In 1942, CASA began to manufacture the Heinkel He 111 and the Junkers Ju 52.[7] In June 1943, the company's capital was increased from 17.5 million to 45 million pesetas. Of this increase, 15 million pesetas were considered to be the INI's stake in the company, in accordance with provisions dictated by the Ministry of Aviation and the INI (**table 1**).[8] Although the INI was a minority shareholder, the man in charge of CASA was a military officer close to the regime, Ortiz Echagüe, who had considerable influence and control over individual shareholders.[9] The government had already wielded considerable indirect control over CASA prior to the war, because the Spanish armed forces were basically the company's

[6] Archivo Histórico BBVA (AHBBVA). Memorias Sociedades. Construcciones Aeronáuticas, S. A., (CASA). (1940-1943).

[7] AHBBVA. Memorias Sociedades. CASA. (1942-1945).

[8] AHBBVA. Memorias Sociedades. CASA. (1943-1945); Archivo Histórico SEPI (AHSEPI). Registro Histórico INI. CASA. Caja 587.

[9] Ortiz de Echagüe left the army in 1931 with the rank of major (*comandante* in Spanish). Following the outbreak of the Spanish Civil War, he joined the insurgents and attained the rank of lieutenant coronel.

only customer. Furthermore, the INI controlled the production of aluminum, a vital material for aircraft construction, and one of its representatives on CASA's board of directors had veto powers (Comín 2001, pp. 189-90; San Román 1999, pp. 260-94).

TABLE 1. CASA shareholders following the 1940 and 1943 capital increases (%)

	1940	**1943**
Banco de Bilbao	28.3	19.9
Banco de Vizcaya	11.5	8.1
Breguet	1.6	1.1
Elizalde	2.9	2.4
INI	0	33
Other banks	25.12	11
Individuals	28	24.2
Vickers	2.3	0

Source: Own work based on San Román (1999), pp. 260 and 293.

Despite the capital increase and the resulting improvement of CASA's manufacturing facilities, the INI believed that the company's production capacity in 1945 was insufficient to "attend to the volume of work under contract at a suitable pace," and further measures had to be taken to double production capacity (San Román 1999, pp. 286-90).[10] Meeting the production targets set by authorities was not entirely in CASA's hands. Severe energy and material constraints in northern Spain caused enormous supply delays for metal profiles and light alloy parts.[11] Not even the supply of coal was guaranteed, and shortages were common in CASA's factories.[12] This greatly slowed down the production of aircraft that had been ordered from CASA, and this situation was further aggravated following the interruption of technology transfers from Germany (Hualde 2016; Sanz 2019, pp. 108-9).

3.3 From the defeat of Germany to the end of Spain's international isolation

In 1945, CASA encountered numerous obstacles in fulfilling contracts to produce German aircraft due to difficulties in obtaining supplies and the interruption of relations with the companies from which the manufacturing licenses had been purchased as a result of Germany's defeat in the Second World War. Autarky, the foreign currency shortage, and limited foreign relations made it difficult to obtain raw materials and essential parts and acquire new technologies, resources, and licenses (Sánchez 2019, p. 81). Many new aircraft were incomplete and therefore grounded because it was impossible to import the

[10] AHBBVA. Memorias Sociedades. CASA. (1945).

[11] AHBBVA. Fondo Chávarri. Correspondencia. Libros copiadores. Libro n. 32. Copiador de cartas número 28 de Víctor Chávarri y Anduiza (letters from Víctor Chávarri to his cousin, José Ortiz Echagüe, September 16 and October 18, 1940).

[12] AHBBVA, Banco de Vizcaya. Alta Dirección. Careaga y Basabe, Pedro. Documentos Personales. Expedientes. Caja 8.02 (04) (letter from José Ortiz de Echagüe to Pedro Careaga y Basabe regarding the coal shortage in CASA's factories, December 17, 1947).

necessary parts – namely, landing gear, engines, propellers, and instruments – and Spanish industry was unable to supply them. Due to the lack of spare parts, cannibalization[13] and grounding aircraft were common practices in this period. CASA had to resort to using engines from the stock of Spain's national airline, Iberia, to keep aircraft flying and carry out test flights. As a result of the engine shortage, fuselages produced by CASA went directly into storage pending the arrival of engines, which did not occur until the 1950s.[14]

In 1946, CASA sought to resolve its difficulties in obtaining machinery and parts by acquiring the facilities and manufacturing equipment of the defunct automobile manufacturer *Sociedad Española de Fabricación de Automóviles* (SEFA) in Madrid. As part of this same expansion program, construction began on a new office building in Madrid to house the company's headquarters and administrative and technical services, as well as the design office set up under an agreement between the INI, Spain's National Institute of Aeronautical Technology (*Instituto Nacional de Técnica Aeronáutica*, INTA),[15] and CASA. The aim was to end CASA's dependence on foreign designs, allowing aircraft to be both designed and manufactured in Spain (Román 1993).[16]

Also in 1946, CASA and the Ministry of Aviation signed an agreement to have the new design office develop the company's first in-house aircraft, the CASA C-201 (Román 1998, p. 126). The C-202 and the C-207, both larger in size, were subsequently developed from the C-201. The contracts for the C-202 and C-207 prototypes were signed in 1948 and 1951, respectively. In 1949, one year later than expected, the first prototype of the C-201 began test flights, using borrowed engines for which it had not initially been designed. In 1950, Spanish authorities signed a contract to purchase a large series of 112 airplanes from CASA.[17]

CASA had made a considerable effort to be able to design and manufacture its own aircraft. The company's engineers and other employees had increasingly good training. In this process, CASA was assisted by German engineers who had decided to move to Spain temporarily after Germany was forbidden from designing and producing aircraft until 1955. The Franco dictatorship tried to promote domestic research and development, particularly in sectors related to defense and military industry, with the active

[13] Cannibalization is a common technique in the aircraft industry when resources are limited that involves removing interchangeable components from an airplane to repair a similar airplane.

[14] Of the 200 He-111 aircraft under order, 130 were outfitted with German-made Junkers engines. The remaining 70 in storage due to the lack of engines until the 1950s. As for the Ju-52, the first 100 were outfitted with German-made BMW motors. The rest finally began to by outfitted with domestically produced Elizalde motors in 1950s. Even the simple Bücker 131 trainer experienced similar difficulties. The first 200 were outfitted with German-made engines, but further deliveries had to wait after the Elizalde Tigre engine began to be manufactured in 1948. AHBBVA. Memorias Sociedades. CASA. (1941-1950).

[15] The National Institute of Aeronautical Technology (INTA) was founded in 1942 to advise authorities and the aircraft industry on the gradual nationalization and normalization of aircraft manufacturing in Spain (Sánchez Ron 1997).

[16] AHBBVA. Memorias Sociedades. CASA. (1946); AHSEPI. Registro Histórico INI. CASA. Caja 587.

[17] AHBBVA. Memorias Sociedades. CASA. (1948-1950).

participation of leading German engineers and scientists. Both Suanzes, the president of the INI, and Juan Vigón, the chief of staff of the Spanish armed forces and former air minister, were among those behind this collaboration, which was tolerated by the West German government (Sanz 2019, pp. 109-11; Delgado 2021, p. 372).

In 1949, Dornier, which had already worked with CASA in the 1920s, licensing its seaplanes for production by the Spanish company, decided to resume its activities in Spain, setting up a design office with the aim of resuming this collaboration (Presas 2008a; 2008b). Willy Messerschmitt and his team collaborated closely with Hispano Aviación, which had been nationalized, developing three prototypes for the Spanish company: the HA-100 Triana, a trainer aircraft with a piston engine; the HA-200 Saeta, Spain's first jet propulsion aircraft, intended for use as a trainer and a light fighter, which was outfitted with French-made Turbomeca engines; and the HA-300, which would have been Spain's first supersonic fighter. Between 1951 and 1956, work was also undertaken to develop a turbojet, the INI-11, which, although it was completely redesigned, was based on the Heinkel HeS 011 (Sanz 2019, p. 111). The INI, the INTA, and the Ministry of Aviation showed an interest in continuing to develop aircraft in Spain and, although Spanish industry's capacity to supply engines and certain parts was insufficient in terms of both quantity and quality,[18] the gradual opening up of the Spanish economy gave reason to believe that these problems would be resolved sooner rather than later (Román 1998, pp. 85-93, 109-17, and 119-31).

During this period, CASA was faced with the impossibility of maintaining contact with the German manufacturers from which it had obtained manufacturing licenses and parts. The company's resilience was the result of its capabilities and a number of drivers. CASA was able to anticipate the shock by observing and identifying threats. In light of the course of the war and the Spanish economy's limitations in the areas of expertise, technology, energy, and materials, CASA made a considerable effort to increase its resources. In addition to making numerous improvements to its facilities, the company invested in improving its human capital and in employee training, with the aim of remedying supply problems by manufacturing its own machinery and equipment.

Following the Second World War, Spain was ostracized internationally, and the German aircraft industry was dismantled. Given these circumstances, CASA understood that fulfilling existing contracts to supply German-designed aircraft was going to be extremely difficult. The company's coping capabilities were the result of quickly understanding the problem and developing possible solutions. Its human capital and its executives' networks played a significant role in this regard. Ortiz Echagüe was a respected military officer and businessman who was close to authorities. CASA was a company partially controlled by the INI, and its shareholders included Spain's most important banks. Both the INI and the

[18] Beyond the early days of aviation, the norm has been for different manufacturers to produce airframes and engines. While there are countries that have both industries, aircraft manufacturers from countries that do not, such as Brazil's Embraer, have had notable success in the international market using motors manufactured in other countries. See Bilstein (1996); Rodengen (2009).

Ministry of Aviation committed to engaging CASA to develop new transport aircraft in order to support the Spanish aircraft industry. In addition to institutional and financial support, working with German engineers who had already collaborated with CASA was a decisive part of this process. These factors proved essential to finding a solution, which involved creating a design office to develop in-house aircraft whose parts could be manufactured in Spain. The company's leadership was able to reconfigure its capabilities and adapt to the new situation, going from manufacturing aircraft under license to designing its own aircraft.

4. The Pact of Madrid and CASA's dependence on the United States, 1953-1967

The 1953 Pact of Madrid brought American technology to Spain. This meant a great leap forward in technology for the Spanish military and also benefited the civilian aviation industry. The Spanish airlines Iberia and Aviaco upgraded their fleets primarily by acquiring airplanes produced in the United States (Viñas 1981; 2003; Jarque 1998; Vidal 2008).[19] Spanish industry received practically no offsets from the United States before the late 1960s. The Franco regime was not in a position to negotiate a more favorable arrangement, Spanish enterprises did not participate in the transactions, and the regime wanted to obtain supplies as quickly as possible. As a result, CASA went from being the Ministry of Aviation's main aircraft supplier to doing maintenance and servicing work (Sánchez 2019, p. 83). The United States pledged to provide $465 million to Spain over a period of four years following the signing of the military and economic aid agreements in 1953. $350 million of this total was reserved for military aid. From 1954 to 1957, the Spanish Air Force received equipment worth $126.25 million (Delgado 2019, p. 29; León 2019, p. 59). 45% of Spain's investment in defense over the following years came from American military aid (Sabaté 2015, p. 40; Pérez 2009). In addition to military aid, improvements in business and professional training, along with the arrival of American technology, businesses, and investment, were key factors in Spain's subsequent economic development. The technical assistance provided to Spanish industry focused primarily on increasing productivity. The aim was to foster economic and political stability in Spain, primarily to advance American military interests (Álvaro 2021, p. 13; Delgado 2021, pp. 378-81).

After the arrival of American aircraft, Spanish authorities lost interest in having airplanes designed in Spain. Projects including the INI 11 turbojet and the HA-300 were abandoned, and German engineers began to return home to help rebuild Germany's aircraft industry. The Spanish aircraft industry came to depend technologically and economically on the United States and became distanced from manufacturers elsewhere in Western Europe, which were starting to undertake collaborative projects to produce both military and civilian aircraft to compete with the powerful American industry. Spain

[19] The agreements that the United States and Spain signed in 1953 were renewed twice during the period discussed in this article, in 1963 and 1970.

failed to take advantage of the aircraft design capabilities and relations with German engineers and manufactures that it had developed during the postwar period. The case of the Do-25 and the Do-27, two aircraft developed as a result of a contract between Dornier and Spain's Ministry of Aviation, is particularly illustrative. Dornier worked with CASA to develop the prototype of the Do-25, which had its first flight in July 1954, but by then the Ministry of Aviation was no longer interested.[20] Despite this setback, Dornier decided to continue working on the design, producing a second prototype, the Do-27. After the ban on manufacturing aircraft in Germany came to an end, the Do-27 became the first airplane built in West Germany after the Second World War. The West German military acquired more than 400 of these airplanes.[21] Dornier told CASA that the two companies could work together to produce some of the aircraft ordered by Germany, with the condition that the Spanish Ministry of Aviation also place an order.[22] The lack of orders from the Ministry of Aviation at the time had the effect of definitively shutting CASA out of collaborating in the production of an airplane that was an international success. Ironically, slightly more than two years later, in 1958, the Ministry of Aviation, which owned the manufacturing license for these aircraft thanks to a clause in the Do-25 contract, ordered 50 units from CASA to alleviate the prolonged work shortage in the Sevilla and Cádiz factories (Román 1998, pp. 185-86).

As for in-house designed aircraft, the 112 units of the C-201 that had been ordered were completed by the late 1955, but only some 15 entered into service. The Ministry of Aviation lost interest in the C-201 after receiving airplanes suited for similar purposes from the United States. 96 airframes remained in storage, taking up space and interfering with work in the Getafe factory until 1962, when the Ministry of Aviation and CASA reached an agreement to liquidate the contract.[23] Reusable components were taken apart, and the fuselages and wings were melted down and turned into aluminum ingots. The same occurred with the 20 units of the C-202 that had been ordered in 1953. This contract was likewise liquidated in 1962 (Román 1998, pp. 126-30).[24]

The C-207, which had its first flights in 1955, was CASA's first airplane to be certified for civilian use. It was designed primarily as a passenger airplane. Its speed and range were comparable to those of its competitors. However, it lacked a pressurized cabin.[25] CASA was keen to obtain certification for the C-207 as quickly as possible in order to offer the airplane to Spain's national airlines,[26] but Iberia and Aviaco – both owned by the INI – chose foreign airplanes that were better known and had better amenities, at a

[20] AHBBVA. Memorias Sociedades. CASA. (1951-1954).

[21] West Germany's aircraft industry needed help to overcome the difficulties it was experiencing, and Cold War tensions led military leaders to demand significant investment in reequipping the country's armed forces (Hirschel, Prem, and Madelung. 2004).

[22] AHBBVA. Memorias Sociedades. CASA. (1955).

[23] AHBBVA. Memorias Sociedades. CASA. (1955-1962).

[24] AHBBVA. Memorias Sociedades. CASA. (1953-1962).

[25] AHSEPI. Registro Histórico INI. CASA. Caja 593.

[26] AHBBVA. Memorias Sociedades. CASA. (1955).

time when tourism was becoming a key sector in the Spanish economy.[27] In view of the lack of interest from these airlines and the resulting lack of work for CASA's factories in Sevilla and Cádiz, the Ministry of Aviation came to the rescue of the C-207, ordering an initial series of 10 units in 1957 and a second series in 1963, also of 10 units, with British-made Bristol Hercules engines.[28]

Technological dependence and the lack of support from the Spanish government to develop new in-house projects and participate in transnational programs kept CASA out of these programs. Budget constraints and the need to acquire equipment, parts, and fuel for the aircraft received by the Spanish Air Force led CASA to try its luck in areas other than aircraft design and manufacturing, particularly aircraft maintenance and manufacturing parts for a variety of industries.[29] The contract to design the C-207 was signed in 1951. The next such contract, for the C-212, did not come until 1968. In the intervening years, CASA did not design any aircraft, and it had practically no involvement in international and foreign projects until the mid-1960s (**table 2**). It made attempts to design new airplanes, and even to start collaborative projects, but none advanced beyond the initial stages (González and López 2020, pp. 128-30). However, CASA was able to benefit from the development of other sectors in Spain by acquiring licenses from foreign companies to manufacture parts for other industries – primarily the construction, automobile, textile, shipbuilding, and electric industries. A number of Spanish companies subcontracted the manufacture of components to CASA. CASA primarily produced automobile and motorcycle parts for SEAT, SANTANA, and VESPA. It also manufactured aluminum passenger coaches for TALGO and blinds, pergolas, and architectural components for the construction industry.[30] Sales increased over the following years, and CASA continued to pay dividends of approximately 10%. However, as can be seen in **figure 3**, net profits/sales continuously decreased over this same period.

The powerful American aircraft industry, unlike its counterparts in Western Europe, had no need to offer offsets such as collaboration in the development of aircraft and compensatory work in exchange for selling its technology to other countries. Furthermore, in many cases, American contractors did not sell directly to U.S. allies. Rather, these countries received remanufactured material that had been retired by the USAF. In Europe, however, the situation was different. Firstly, many aircraft manufacturing facilities had been destroyed during the Second World War, and the American industry was responsible for supplying a large number of aircraft to European allies. Secondly, European countries had smaller armed forces, airlines, and aircraft

[27] AHSEPI. Expedientes Originales. AVIACO, Caja 42.

[28] AHBBVA. Memorias Sociedades. CASA. (1955-1963).

[29] Military expenditure as a percentage of Spain's GDP fell drastically beginning in 1950: 8.17% from 1940 to 1949, 4.12% from 1950 to 1959, 3.17% from 1960 to 1969, and 2.7% from 1970 to 1975. Expenditure on the Ministry of Aviation amounted to 0.61%, 0.4%, 0.33%, and 0.31% GDP in these four decades (Sabaté 2015).

[30] AHBBVA. Memorias Sociedades. CASA. (1953-1954); AHSEPI. Registro Histórico INI. CASA. Cajas 585 & 587.

industries. As a result, companies and governments were interested in working together and developing joint projects with the aim of securing funding for development and boosting exportations. The French and British governments supported domestic manufacturers by ordering aircraft for civilian and military use and providing them all manner of subsidies. In addition to promoting technological and industrial development in France and the United Kingdom, the goal of this governmental support was to maintain a certain degree of independence in relation to the United States. It is important to note that the U.S. government reserved the right to veto the use of military equipment produced in the United States (Chadeau 1985; Colin 1999; Burigana and Deloge, 2010; Seiller 2010). European NATO member countries wanted to have interoperable equipment and sought to increase their scientific, technological, and military independence. Although Spain was a dictatorship and did not belong to NATO, both France and West Germany attempted to sell their products in Spain, offering different forms of compensation, but it was difficult to compete with the United States. The Spanish aircraft industry, which had successfully exported the HA-200 to Egypt, selling 10 pre-series aircraft and a license to produce 90 units, suffered the consequences of Spain's dependence on the United States. The Spanish military's limited budget was spent on American equipment (León-Aguinaga and Delgado 2018, 90; Sanz 2019, 120), forcing CASA to abandon its own development projects and distancing the company from other manufacturers in Western Europe.

TABLE 2. The most important airplanes manufactured by CASA (1923-1972)

Name	First flight	Name	First flight
Breguet 19	1926	Bücker Bu-133	1941
Dornier Do J Wal	1929	CASA-201 Alcotán	1949
CASA III	1929	CASA-202 Halcón	1952
Vickers Vildebeest	1935	CASA-207 Azor	1955
Polikarpov I-15	1937	DO-25	1954
Bücker Bu-131 (C-1131)	1941	DO-27	1959
Junkers 52 (C-352)	1944	Northrop F-5	1968
Heinkel 111 (C-2111)	1945	CASA-212 Aviocar	1971

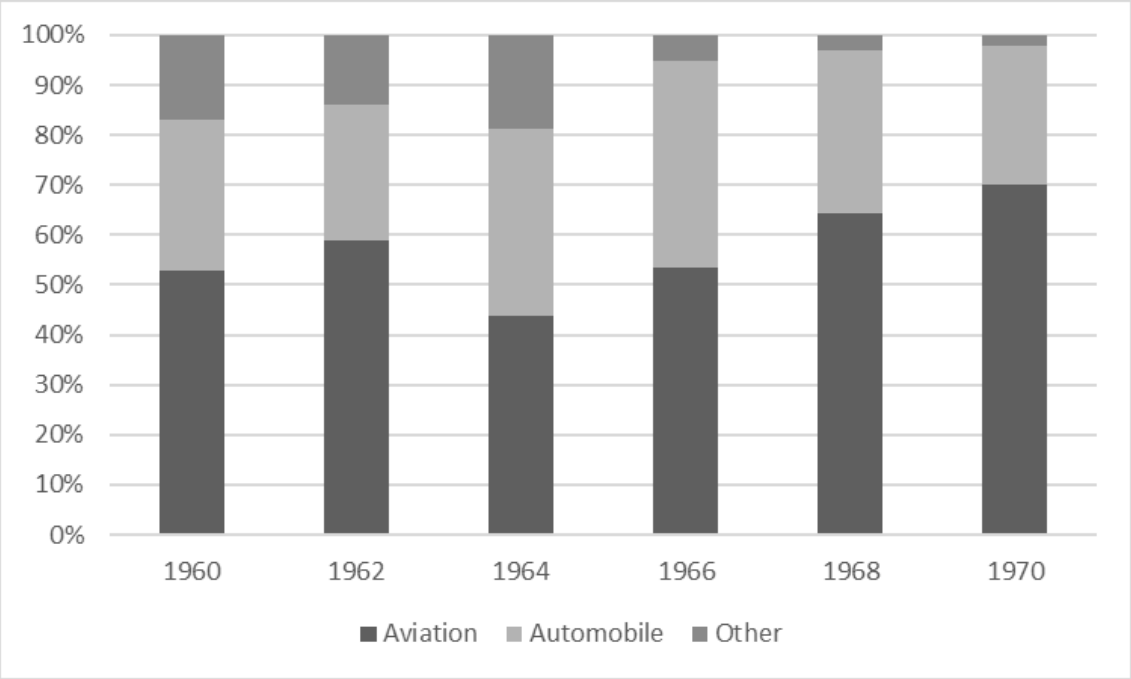
Source: Own work based on Román (1998), pp. 202-203.

Since the Civil War, CASA had been financed and expanded using Spanish capital. However, in 1961, the Spanish government approved the sale of twenty thousand shares to the American manufacturer Northrop Corporation, which acquired 24% of the company in 1964. This further distanced CASA from the European aircraft industry and eliminated the possibility of developing new in-house models in the ensuing years. The arrival of Northrop occurred just as European, and particularly German, manufacturers were becoming increasingly interested in working with CASA. Hamburger Flugzeugbau[31] had been engaged in negotiations to have CASA work on the HFB320 jet

[31] HBF's interest in CASA came as relations between the West Germany government and the Franco regime were becoming closer, principally because the Federal Republic of Germany needed a place to store part

for some months.[32] The German manufacturer was interested in working with CASA so that the Spanish government would commit to purchasing HFB320 jets, help fund the development of the airplane, and take an interest in collaborating on other civilian and military aircraft projects in the future. Hamburger Flugzeugbau and CASA did sign an agreement, but the Franco regime prioritized working with Northrop because it was interested in space research. As a result, CASA had only a limited involvement in developing the HFB320 prototype and in building the airframes for series aircraft (Román 1998, pp. 186-87).[33] However, Northrop's aims in Spain had nothing to do with space research. Rather, it primarily sought to license the manufacture of a large number of its airplanes to the Spanish government so that CASA's factories would produce them. Secondarily, Northrop was interested in having CASA manufacture architectural components for the booming construction industry in Spain under license from its subsidiary, Northrop Architectural Systems (NAS).[34]

FIGURE 2. Distribution of CASA's turnover by industry, 1960-1970 (selected years)



Source: Own work based on CASA's annual reports (1960-1970), housed at the AHBBVA. *Notes:* the category "Other" refers primarily to the electric, shipbuilding, textile, construction, and railroad industries.

of its arms stock abroad to defend itself against a hypothetical Soviet attack that might affect domestic military facilities. This development aroused the suspicions of France, which eventually allowed West Germany to store military equipment in French territory. The plan to build German bases in Spain was abandoned (Collado 1991).

[32] AHBBVA. Memorias Sociedades. CASA. (1961-1963).

[33] 47 units of the HFB320 business jet were produced. Most were acquired by the Western German air force. None were acquired by Spain.

[34] AHBBVA. Memorias Sociedades. CASA. (1964).

As a result of Northrop's stake in CASA and negotiations between the Spanish government, CASA, and Northrop, the Ministry of Aviation ordered 70 Northrop F5 airplanes from CASA in 1965. This fighter had already been developed, and its technical and material requirements meant that it could only be partially manufactured under license in Spain. The F5 nevertheless signified a significant leap forward in CASA's manufacturing capabilities. Complex components were built using modern manufacturing techniques with high quality and control standards. Northrop supplied and paid for the necessary equipment and machinery and provided technical assistance to train the personnel involved in manufacturing the F5. The manufacturing process was computerized. CASA began to use synthetic resins to join together different components and manufacture basic bonded sandwich components, which would subsequently become important to the company's evolution.[35] In short, producing the F5 brought about the modernization of CASA's aircraft manufacturing processes. However, the company's design expertise would not be brought up to speed until it established closer relations with German and French manufacturers.

CASA's first aerospace work also came in 1965, thanks to ESRO. As one of the founding members of ESRO in 1964, part of the funding that Spain contributed to the agency had to be fed back into the country's industry. In this way, CASA began to work as a subcontractor for European aerospace companies that were already involved in ESRO projects.[36] After taking part in the manufacture of Centaure rockets for the French company Sud-Aviation, and to a lesser degree other ESRO projects, Spain informed ESRO that it considered the economic returns it was receiving insufficient to justify continued membership in the organization. The Spanish government believed, with good reason, that its membership payments served to benefit countries with more advanced aerospace industries and pushed to obtain more contracts for the Spanish industry (Sánchez Ron 1994, pp. 43-44). As a result, starting in 1968, Spain began to negotiate the awarding of contracts that benefitted CASA directly with ESRO.[37]

In the period that began in 1953, CASA had to deal with the new situation of the Spanish military receiving equipment from the United States. While Spain's new relations with the United States and the opening up of the Spanish economy offered opportunities, CASA's leadership was aware that crucial times were coming for the company. By the second half of the 1950s, the number of aircraft ordered from CASA by the Ministry of Aviation had decreased significantly. Despite this, CASA had strong anticipation capabilities. Over the previous years, the company had significantly improved its material and human resources, thus improving its design and development capabilities and considerably increasing its production capacity.

[35] AHSEPI. Memorias de Empresas. CASA. (1965); AHBBVA. Memorias Sociedades. CASA. (1966-1971).

[36] AHSEPI. Memorias de Empresas. CASA. (1965); AHSEPI. Registro Histórico INI. CASA. Cajas 601 & 603.

[37] European University Institute - Historical Archives of the European Communities, ESRO: ESRO-7780 20/12/1968-24/10/1969: Contract between ESRO and Construcciones Aeronauticas (CASA).

Nevertheless, CASA lagged far behind aircraft manufacturers in the United States. Its leadership understood that, given how the sector had evolved, it was not in a position to compete with the powerful American industry. CASA faced reality, accepting its new secondary role in supplying aircraft to the Spanish Air Force. The answer to this new situation was to look for alternative business opportunities, such as aircraft maintenance for both the Spanish Air Force and the USAFE (United States Air Forces in Europe) and manufacturing metal parts and machinery for other industries. CASA already had a knowledge base and experience in producing metal (and particularly aluminum) parts and a variety of machinery to meet its own needs and those of other sectors as a result of the limitations of Spanish industry and difficulties in importing during the postwar period. Furthermore, CASA had made a significant investment in training workers.[38] CASA was able to diversify its output (**figure 2**) thanks to its executives' networks and ties to companies from growing industries and the relationships it had developed with corporations that were aircraft manufacturers and also supplied products and services to other industries. It should be noted that Ortiz Echagüe had been named president of SEAT in 1950. All of CASA's main non-aviation customers, including SEAT, had either been founded or were partially owned by the INI (San Román 2000, pp. 311-12; Delgado 2021, p. 380). Banco de Bilbao and Banco de Vizcaya, together with the INI, helped CASA obtain the financial resources needed for adaptation.

CASA's adaptation involved converting its factories. The Madrid and Getafe factories, which had the greatest production capacity and were where the company's technical and human resources were primarily concentrated, specialized in the maintenance and servicing of both Spanish Air Force and USAFE aircraft and the production of light alloy parts for other industries. Although this work was not as complex as designing and manufacturing, servicing USAFE aircraft allowed CASA's employees to become familiar with the changes that had occurred in aviation after the Second World War and the cutting-edge U.S. aircraft industry. USAFE became CASA's main customer. The maintenance and servicing of its aircraft accounted for 35% of the company's turnover in 1959, and between 25% and 32% in the first half of the 1960s, before gradually becoming less significant in the second half of this decade.[39] CASA's employees learned to take apart and repair complex pressurized and supersonic aircraft that were made from new materials like titanium. The company received new equipment and updated its facilities. Additionally, some aeronautical engineers began to travel to the United States to receive further training and increase the company's productive capacity.

The leadership skills and networks of Ortiz Echagüe and other executives were essential to solving the problem of the lack of work in the Cádiz and Sevilla factories and the design office due to the paucity of orders from the Ministry of Aviation. In 1957, to increase the Sevilla factory's operating hours, CASA set up a maintenance center at the San Pablo

[38] AHSEPI. Expedientes Originales. CASA. Caja 66; AHBBVA. Memorias Sociedades. CASA. (1955-1963).

[39] AHBBVA. Memorias Sociedades. CASA. (1959-1963).

airport for propeller airplanes and helicopters, which are less technically complex than jet aircraft.[40] The company attempted to remedy the severe lack of work in the Cádiz factory by taking orders from the shipbuilding industry – primarily from the public enterprise Empresa Nacional Bazán – and providing maintenance services for the Spanish Navy's helicopter fleet. However, the lack of work persisted because these contracts were few in number and of limited value.[41] Arrangements made by company leadership to allocate the resources needed to move the production of some automobile and motorcycle parts that were being manufactured in other factories to Cádiz and Sevilla, and to begin manufacturing new products, were essential to solving this problem. The networks of CASA's executives, and particularly those of Ortiz Echagüe, were again crucial to obtaining manufacturing licenses. In 1963, in response to demand from the Spanish textile industry, CASA reached an agreement with Dornier – a company with which it had worked closely in the past – to produce weaving machines under license in the Sevilla and Cádiz factories.

CASA also sought alternative projects for its design office, which designed a number of light alloy components for different industries, such as the new gondola for the transporter bridge between Portugalete and Getxo in the Basque Country (1964). The company tried to maintain its design capabilities by not entirely abandoning preliminary studies of potential new aircraft. In the late 1960s, these studies were focused on developing a versatile light transport aircraft that would be inexpensive to produce and maintain. This aircraft, called the C-212, was intended to replace multiple aircraft models then in service in the Spanish Air Force. CASA was thus beginning to boost its anticipation capabilities by engaging in collaboration, research and development, and market research.

5. Changing course, 1968-1972: increased participation in international projects and European integration

In the late 1960s, a number of the Spanish Air Force's aircraft were reaching the end of their operational lifespan. Aeronautical equipment manufactured in the United States was subject to veto, meaning it could not be used in Spain's colonial conflicts in North Africa. The Spanish Air Force wanted airplanes that were not subject to any such restrictions to avoid the limitations experienced during the Ifni War (1957-1958) and therefore needed to diversify its suppliers. These circumstances led Spanish authorities to turn to CASA, whose design capacity was limited, and to Europe. CASA had worked with the German aircraft industry in the past, and France and Spain shared interests in North Africa. European governments and manufacturers saw an opportunity to sell their products in Spain in joint manufacturing, technology transfer, and industrial and political offsets (Sánchez 2006, pp. 83-87; Delgado 2019, pp. 41-44; Delgado and León-Aguinaga 2018, pp. 55-70). Both CASA and the Spanish government knew that the Ministry of Aviation's

[40] AHBBVA. Memorias Sociedades. CASA. (1956).

[41] AHBBVA. Memorias Sociedades. CASA. (1958-1959).

increased demand for aircraft would not be enough to guarantee the company's growth and profitability. This made increased cooperation at the European level necessary.

In 1968, the Ministry of Aviation and CASA reached an agreement to develop the C-212. They agreed to encourage companies from other European countries to take part in developing the new airplane in order to establish collaborative relationships. To this end, an agreement was signed with HFB to have the German company design part of the airplane. The Spanish government, while encouraging collaboration with foreign companies and the development of in-house designs, also undertook a program of mergers, following the example of other governments and manufacturers in Western Europe (McGuire 1997; Kechidi and Talbot 2013). CASA took over the other aircraft companies in which the INI had a stake (for the evolution of the company's workforce, see **table 3**).[42] The aim was to create a Spanish aircraft industry that was capable of working with other foreign industries – particularly in Europe – and had a certain amount of export capacity.

TABLE 3. The evolution of CASA's workforce

	1940	1945	1950	1954	1968	1969	1970	1971	1972
Executives					10	9	9	9	10
Engineers and university graduates			50		95	97	114	141	175
Technicians			375		545	561	604	639	834
Office workers			385		565	561	572	597	674
Assistants					180	177	181	173	217
Factory workers	866	1,736	2,750	3,281	3,305	3,358	3,551	3,707	4,206
TOTAL			3,560		4,700	4,763	5,030	5,266	6,116

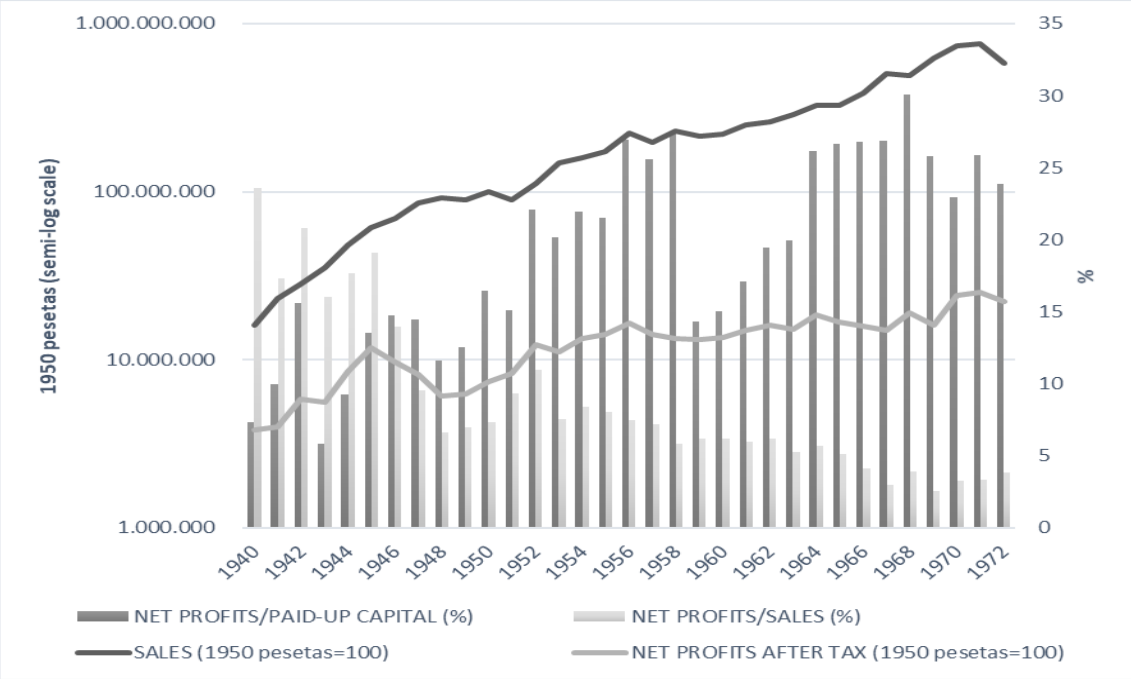
Source: Own work based on CASA's annual reports (1950, 1968-1971, 1975) housed at the AHBBVA and Román 1988, p. 75. *Notes:* In 1972, 583 HASA employees became part of CASA's workforce: 1 executive; 15 engineers and university graduates; 138 technicians; 46 office workers; 32 assistants; 352 factory workers.

The first step in increasing Spain's collaboration with industries in other countries was to change public procurement policies. In 1969, the Spanish government decided to procure orders from abroad for the domestic aircraft industry by demanding offsets when purchasing foreign aeronautical material for both military and civilian use. This meant that, regardless of how many orders CASA received directly from the Spanish government, all acquisitions of foreign material that could not be manufactured entirely in Spain had to provide work for the Spanish industry as compensation. Manufacturers in Western Europe were interested in increased collaboration with Spain. In mid-1969, the French manufacturer Avions Marcel Dassault (AMD) contacted CASA to suggest that it participate in the development of the Mercure program. AMD's interest in CASA came at a time of good military relations between France and Spain, which saw Spain take an

[42] AHBBVA. Memorias Sociedades. CASA. (1968); AHSEPI. Presidentes y Altos Cargos. CASA. Caja 48.

interest in acquiring Mirage III aircraft from AMD.[43] The Mercure was the first jet-powered airliner specifically designed for regional flights of less than 800 nautical miles. In addition to France, Italian, Belgian, and Swiss companies were involved in the program. CASA was offered the opportunity to produce a piece of the fuselage that constituted 5.6% of the total structure. By seeking foreign collaborators, AMD aimed to secure the financing needed to develop the Mercure and receive orders for this airplane from Italy, Belgium, Switzerland, and Spain's national airlines,[44] in addition to French airlines. To these ends, it was necessary for these countries' aircraft industries to take part in manufacturing the four prototypes, thus acquiring the right to produce the sections they had built for all Mercure airplanes sold in the future.[45] There was, however, another major factor: the recent agreements between CASA and the German manufacturer HFB had the potential to jeopardize the French aircraft industry's significant business opportunities in Spain. The Spanish government had showed an interest in having the Spanish aircraft industry work with industries in multiple European countries to improve its technology and human capital. As a result, AMD wanted to start collaborating and make offers as soon as possible (Sánchez 2019, p. 91).[46]

FIGURE 3. CASA's sales and results, 1940-1972 (in 1950 pesetas and %)



Source: Own work based on CASA's annual reports (1957-1972), housed at the AHBBVA and the AHSEPI. CPI deflator with base 100 in 1950 taken from Carreras and Tafunell 2010.

[43] During the presidency of Charles de Gaulle, France and Spain sought to strengthen their relationship in the area of defense (Sánchez 2006).

[44] Iberia studied the possibility of using the Mercure but ruled it out. AHSEPI. Presidentes y Altos Cargos. IBERIA. Caja 39.

[45] AHBBVA. Memorias Sociedades. CASA. (1969); AHSEPI. Registro Histórico INI. CASA. Cajas 4613 & 4817.

[46] AHBBVA. Memorias Sociedades. CASA. (1969).

Spain's negotiations with France to acquire 30 Mirage III fighters soon bore fruit. The contract signed in February 1970 stipulated that the French aircraft industry had to provide work equivalent to at least 20% of the total value of the purchase, meaning at least 1,200 million pesetas.[47] Thanks in large part to this offset agreement, CASA's participation in international programs increased significantly in 1970. Its share of the production of the fuselage for the Mercure rose to 13.8%, and it began to take part in the production of the Mystère-10 (Falcon 10), manufacturing the wings for this corporate jet.[48]

The Spanish government helped strengthen these relations by making additional purchases. It acquired multiple Falcon 20 aircraft, which began to be delivered in 1970, and it placed orders for the Airbus A300 that a number of European aerospace companies were developing. As a result of this policy and negotiations between the governments of Spain, France, and West Germany, CASA signed an industrial collaboration agreement with Airbus Industrie. CASA became a full member of the Airbus Industrie Economic Interest Group and a participant in the Airbus A300 program. Its share in the project was set at 4.2% of the production of the airframe and of the general assembly, which was far lower than the share assigned to French, German, and British companies[49] and was based on the number of airplanes that Iberia was willing to acquire (at least four units, with an option for eight more) (Hayward 1987; McGuire 1997; Román 1998, pp. 190-92).[50] These projects forced CASA to make significant investments to go from being a contractor to being a coparticipant and led to the Spanish government's share in the company increasing. In 1971, as part of the government's reorganization of the Spanish aircraft industry, the INI acquired a majority stake in CASA, and CASA absorbed Hispano Aviación.[51] Aircraft manufacturing was once again CASA's main business.

6. Conclusions

During the Franco dictatorship, CASA had to deal with two major shocks: firstly, the Second World War, Spain's international ostracization, and autarky during the first years of the regime; and, secondly, strong military and technological dependence on the United States, following the change in foreign policy starting in 1953. Its resilience in the face of these events was closely linked to the networks, contacts, and leadership of its

[47] AHBBVA. Memorias Sociedades. CASA. (1969-1970); AHSEPI. Archivo de Altos Cargos. José Sirvent, CASA. Caja 24; AHSEPI. Registro Histórico INI, Cajas 4613 & 4817.

[48] AHBBVA. Memorias Sociedades. CASA. (1970).

[49] The Airbus Economic Interest Group was founded in December 1970. The governments of France, the United Kingdom, and West Germany had been working on this idea since 1967. In 1979, AIRBUS comprised manufacturers from France (Aérospatiale, 37.9%), West Germany (Deutsche Airbus, 37.9%), the United Kingdom (British Aerospace, 20 %), and Spain (CASA, 4.2%). When the consortium was formed, all four companies were partially owned by the governments of their respective countries (Francis and Pevzner 2006, p. 639).

[50] AHBBVA. Memorias Sociedades. CASA. (1970-1972); AHSEPI. Registro Histórico INI. CASA. Cajas 4015 & 4209; AHSEPI. Presidentes Altos Cargos. Caja 38.

[51] AHBBVA. Memorias Sociedades. CASA. (1970-1972).

executives, and particularly of its founder, Ortiz Echagüe, which provided the resources and relationships needed to tackle these problems.

However, the adaptation and specialization strategy that CASA adopted in the 1950s and 1960s ended up reducing its capacities and expertise, conditioning the possible paths it could take. Working for other industries and in aircraft maintenance distanced CASA from design processes, leading to the atrophy of the design office's human capital. CASA wasted the practice and experience gained in designing new aircraft and was left behind as the aircraft industry continuously evolved during this period.

The company's specialization made it resilient but had the effect of distancing it from aircraft design and development and from the European aircraft industry. Aircraft manufacturers in Europe had no choice but to work together to survive in the face of competition from the powerful American industry. In the late 1960s, the Spanish government's decision to change its procurement policy and support the domestic aircraft industry, beginning the merger process that saw CASA absorb the other companies in the sector and the INI take a majority stake in the resulting company, was the decisive factor in CASA returning to designing its own aircraft and increasing its ties to the European industry. This closer collaboration between different European actors allowed assets from different countries to be utilized, synergies to be created, objectives to be unified, and markets to be expanded. It allowed them to compete against the powerful American aircraft industry. CASA became another link in the European aircraft industry's resilience process, which led to it collaborating with manufacturers from other countries and subsequently joining the Airbus consortium. CASA played a significant role in this process in the area of composite materials, which were increasingly being used in the aircraft industry.

Maintenance and service work allowed CASA to increase its productive capacity, become familiar with technological advances in the aircraft industry, and begin to work with new materials – including titanium, synthetic resins, and composite materials. However, the importance that work outside the sector and aircraft maintenance had taken on in prior years had a negative effect on its design capabilities as an aircraft manufacturer. CASA was at a clear disadvantage compared to its French, German, and Dutch counterparts, whose ranks it would join as participants in the Airbus A300 program. A 1973 study conducted by the Stanford Research Institute for CASA identified the company's strengths and weaknesses. It highlighted the following strengths: the company's reputation in the industry, strong financial capacity, low labor costs, the possibility of negotiating contracts from other countries, and skilled executive and technical personnel. However, the company had a greater number of weaknesses. It failed to plan ahead and was administratively disorganized. Its budgeting and costing systems were inadequate, and it lacked a proper sales organization structure. Its hiring practices and program management were deficient, and it lacked a policy and centralized management in the area of human resources. The company's acquisitions were not well-organized. Most importantly, its research and development activity was extremely limited, and it was

heavily technologically dependent.[52] These circumstances would prevent CASA from playing a more prominent role in European aircraft projects in the new chapter that was beginning for the company.

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References

Álvaro Moya, Adoración. 2011. 'Guerra fría y formación de capital humano durante el franquismo. Un balance sobre el programa estadounidense de ayuda técnica (1953-1963),' *Historia del presente*, 17: 13-25.

Bilstein, Roger E. 1996. *The American Aerospace Industry: From Workshop to Global Enterprise*. New York: Twayne.

Brunsdon, David, and Erica Dalziell. 2005. 'Making Organisations Resilient: Understanding the Reality of the Challenge.' Rotorua, New Zealand: Resilient Infrastructure Conference.

Burigana, David, and Pascal Deloge. 2010. 'Introduction. Les coopérations aéronautiques en Europe dans les années 1950-1980: une opportunité pour relire l'histoire de la construction européenne?,' *Histoire, Économie et Société*, 29 (4): 3-18.

Carreras, Albert, and Tafunell, Xavier. 2010. *Historia económica de la España Contempóranea (1789 – 2009)*. Barcelona: Crítica.

Catalán, Jordi. 1995. *La economía española y la Segunda Guerra Mundial*. Barcelona: Ariel.

Chadeau, Emmanuel. 1985. 'État, industrie, nation: la formation des technologies aéronautiques en France (1900-1950),' *Histoire, Économie et Société*, 4 (2): 275-99.

Colin, Armand. 1999. 'La reconstruction dans l'industrie aéronautique: l'exemple français, 1944-1946,' *Histoire, Économie et Société*, 18 (2): 435-49.

Collado, Carlos. 1991. 'Planes militares de Adenauer en España. El proyecto de instalación de bases militares de 1960,' *Espacio, Tiempo y Forma*, 5: 97-116.

Comín, Francisco. 2001. 'El triunfo de la política sobre la economía en el INI de Suanzes,' *Revista de Economía Aplicada*, 9 (26): 177-211.

Dalziell, Erica P., and Sonia T. McManus. 2004. 'Resilience, Vulnerability and Adaptive Capacity: Implications for Systems Performance.' Stoos, Switzerland: 1st International Forum for Engineering Decision Making.

[52] Meeting of CASA's Board of Directors, June 30, 1973, AHBBVA.

Delgado, Lorenzo. 2019. 'Coordenadas de la asistencia militar norteamericana al franquismo en los años cincuenta: entre el deseo y la realidad,' *Ayer*, 116: 21-48.

Delgado, Lorenzo. 2021. 'Welcome to the Future! Science as a Tool for American Geopolitics in 1950s' Spain.' In *Science, Cultural and National Identity in Francoist Spain, 1939-1959*, edited by Marició Janué i Miret and Albert Presas i Puig, 371–93. Basingstoke: Palgrave Macmillan.

Delgado, Lorenzo, and Pablo León-Aguinaga. 2018. 'The Deployment of U.S. Military Assistance to Franco's Spain: Limited Modernization and Strategic Dependence,' *Cold War History*, 21 (1): 55-70.

Duchek, Stephanie. 2020. 'Organizational resilience: a capability-based conceptualization,' *Business Research*, 13: 215-46.

Erro, Carmen. 2012. *El empresario fotógrafo. José Ortiz Echagüe (1886-1980)*. Madrid: EADS CASA.

Evenhuis, Emil. 2017. 'New directions in researching regional economic resilience and adaptation,' *Geography Compass*, 11: 1-15.

Francis, John G., and Alex F. Pevzner. 2006. 'Airbus and Boeing: Strengths and Limitations of Strong States,' *Academy of Political Science*, 121 (4): 629-51.

Gómez Mendoza, Antonio (ed.). 2000. *De mitos y Milagros. El Instituto Nacional de Autarquía (1941-1963)*. Barcelona: Edicions de la Universitat de Barcelona.

Gómez Mendoza, Antonio, and Santiago López. 1992. 'Los comienzos de la Industria Aeronáutica en España y la ley de Wolff (1916-1929),' *Revista de Historia Industrial-Industrial History Review*, 1 (1): 155-77.

González Cascón, Álvaro and Santiago M. López. 2020. 'José Ortiz Echagüe (1866-1980): la consolidación de la industria aeronáutica.' In *Trazas y negocios. Ingenieros empresarios en la España del siglo XX*, edited by Gloria Quiroga Valle, 113-32. Granada: Comares.

Hayward, Keith. 1987. 'Airbus: Twenty Years of European Collaboration,' *International Affairs*, 64 (1): 11-26.

Hirschel, Ernst H., Horst Prem, and Gero Madelung. 2004. *Aeronautical Research in Germany: From Lilienthal until Today*. Munich: Springer.

Howson, Gerald. 2000. *Armas para España: la historia no contada de la Guerra Civil Española*. Barcelona: Ediciones Península.

Hualde, Xabier. 2016. *El cerco aliado. Estados Unidos, Gran Bretaña y Francia frente a la dictadura franquista (1945-1953)*. Bilbao: Universidad del País Vasco.

Iborra, María, Safón, Vicente, and Consuelo Dolz. 2020. 'What explains the resilience of SMEs? Ambidexterity capability and strategic consistency,' *Long Range Planning*, 53 (6): article 101947.

Jarque, Arturo. 1998. *Queremos esas bases: el acercamiento de Estados Unidos a la España de Franco*. Alcalá de Henares: Universidad de Alcalá.

Kechidi, Med, and Damien Talbot. 2013. 'Les mutations de l'industrie aéronautique civile française : concentration, externalisation et firme-pivot,' *Entreprises et histoire*, 73: 75-88.

Leitz, Christian. 1996. *Economic Relations between Nazi Germany and Franco's Spain (1936-1945)*. Oxford: Clarendon Press.

León-Aguinaga, Pablo. 2019. 'Los programas de formación para la "Mutua Defensa" entre España y Estados Unidos en los años cincuenta,' *Ayer*, 116: 49-76.

León-Aguinaga, Pablo, and Lorenzo Delgado. 2018. '"Fly Me to the Cold War": The United States and the Modernization of the Spanish Air Force in the 1950s.' In *Air Force Advising and Assistance: Developing Airpower in Client States*, edited by Edward B. Westermann and Donald Stoker, 89-117. Warwick: Helion.

López, Santiago M., Aitziber Elola, Jesús M. Valdaliso and Mari J. Aranguren. 2012. *El clúster de la industria aeronáutica y espacial del País Vasco: orígenes, evolución y trayectoria competitiva*. Donostia: Eusko Ikaskuntza; Instituto Vasco de Competitividad - Fundación Deusto.

López, Santiago M., and Álvaro González. 2019. 'La Hispano Suiza y la aeronáutica: innovar en el primer tercio del siglo XX.' In *Pioneros: empresas y empresarios en el primer tercio del siglo XX en España*, edited by Raúl Molina, 205-32. Granada: Comares.

Martín Aceña, Pablo, and Francisco Comín. 1991. *INI: 50 años de industrialización en España*. Madrid: Espasa-Calpe.

Mayo, Luis. 2017. 'La industria nacional del sector aeroespacial,' *Cuadernos de estrategia*, 192: 185-226.

McGuire, Steven. 1997. *Airbus Industrie: Conflict and Cooperation in US-EC Trade Relations*. London: Macmillan.

Moradiellos, Enrique. 2001. *El reñidero de Europa: las dimensiones internacionales de la Guerra Civil Española*. Barcelona: Península HCS.

Nadal, Jordi. 2020. *La Hispano Suiza. Esplendor y ruina de una empresa legendaria*. Barcelona: Pasado y Presente.

No author. 1948. *Construcciones Aeronáuticas, S.A., 1923-1948*. Madrid: CASA.

Pal, Rudrajeet, Håkan Torstensson, and Heikki Mattila. 2014. 'Antecedents of organizational resilience in economic crises—an empirical study of Swedish textile and clothing SMEs,' *International Journal of Production Economics*, 147: 410-28.

Pecker, Beatriz, and Carlos Pérez. 1983. *Crónica de la aviación española*. Madrid: Sílex.

Pérez, Francisco. 2009. *El Gasto de Defensa en España 1946-2009*. Madrid: Ministerio de Defensa.

Presas, Albert. 2008a. 'La inmediata posguerra y la relación científica y técnica con Alemania.' In *Cien años de política científica en España*, edited by Ana Romero and María J. Santesmases, 173-210. Bilbao: Fundación BBVA.

Presas, Albert. 2008b. 'Technological Transfer as a Political Weapon: Technological Relations between Germany and Spain from 1918 to the early 1950s,' *Journal of Modern European History* 6 (2): 218-36.

Rodengen, Jeffrey L. 2009. *The History of Embraer*. Fort Lauderdale: Write Stuff Enterprises.

Román, José M. 1993. *Tres escuelas y veinte promociones de Ingenieros Aeronáuticos*. Madrid: Escuela Técnica Superior de Ingenieros Aeronáuticos.

Román, José M. 1998. *CASA, los primeros 75 años, 1923-1998*. Madrid: CASA.

Sabaté, Oriol. 2015. 'Military spending, institutional stability and fiscal capacity. Spain in comparative perspective (1850-2009).' PhD Thesis, Barcelona: Universitat de Barcelona.

Salas, Jesús. 1983. *De la tela al titanio: el ayer y el hoy de la creatividad aeronáutica en España*. Madrid: Espasa-Calpe

San Román, Elena. 1999. *Ejército e industria: el nacimiento del INI*. Barcelona: Crítica.

San Román, Elena. 2000. 'José Ortiz Echagüe (1886-1980).' In *Los 100 empresarios españoles del siglo XX*, edited by Eugenio Torres, 308-12. Madrid: LID.

Sánchez, Esther M. 2006. 'Armamento e instrucción militar. Francia y la modernización del ejército español, 1948-1975,' *Ayer*, 63: 211-32.

Sánchez, Esther M. 2019. 'Francia, las Fuerzas Armadas españolas y el suministro de aviones Mirage,' *Ayer*, 116: 77-104.

Sánchez Ron, José M. 1997. *INTA. 50 años de Ciencia y Técnica Aeroespacial*. Madrid: INTA.

Sánchez Ron, José M. 1994. 'Poder científico versus poder político: reflexiones a propósito del CERN y de ESRO/ESA,' *Arbor*, 577-578: 27-50.

Sanz Díaz, Carlos. 2019. 'Aliado silencioso: Alemania Occidental y la modernización de la defensa en España, 1945-1986.' *Ayer*, 116: 105-32.

Seiller, Florian. 2010. 'Les négociations sur la production sous licence des avions Fouga Magister et Noratlas: un exemple concret des débuts de la coopération franco-allemande en matière d'armement dans les années 1950,' *Histoire, Économie et Société*, 29 (4): 19-36.

Serrat, Olivier. 2017. 'On Resilient Organizations.' In Oliver Serrat, *Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizations Performance*, 245-50. Singapore: Springer.

Valdaliso, Jesús M. 2020. 'Accounting for the resilience of the machine tool industry in Spain (c. 1950-2015),' *Business History*, 62 (4): 637-62.

Vidal, Javier. 2008. *Las alas de España: Iberia, líneas aéreas. De aerolínea de bandera a transportista mundial, 1940-2005*. Valencia: Universitat de València.

Viñas, Ángel. 1981. *Los pactos secretos de Franco con Estados Unidos: bases, ayuda económica, recortes de soberanía*. Barcelona: Grijalbo.

Viñas, Ángel. 1984. *Guerra, dinero, dictadura: ayuda fascista y autarquía en la España de Franco*. Barcelona: Crítica.

Viñas, Ángel. 2003. *En las garras del águila: los pactos con Estados Unidos, de Francisco Franco a Felipe González (1945-1995)*. Barcelona: Crítica.

Viñas, Ángel. 2008. 'Armas y hombres para España. Los apoyos exteriores en la guerra civil.' In *Economía y economistas españoles en la Guerra Civil*, edited by Enrique Fuentes and Francisco Comín, 339-424. Madrid: Galaxia Gutenberg.

Viñas, Ángel. 2020. 'Los apoyos exteriores, palancas de la victoria y de la derrota.' In *En el combate por la historia. La República, la Guerra Civil, el Franquismo*, edited by Ángel Viñas, 251-63. Barcelona: Pasado y Presente.

Winter, G. Sidney. 2003. 'Understanding Dynamic Capabilities,' *Strategic Management Journal*, 24 (10): 991-5.

Zhou, Qin, Tinkuma Ejovi Edafioghor, Chia-Huei Wu, and Bob Doherty. 2022. 'Building organizational resilience capability in small and medium-sized enterprises: The role of high-performance work systems,' *Human Resource Management Journal*, 33 (4): 806-27.

Construcciones Aeronáuticas SA (CASA), 1939-1972. Resiliència i adaptació a la política de defensa i a les relacions internacionals d'Espanya

RESUM

L´objectiu principal d´aquest treball és explicar la resiliència de l´empresa Construcciones Aeronáuticas S.A. (CASA) després de la Guerra Civil i com es va adaptar, primer, a la situació d'autarquia i intervencionisme durant el primer franquisme i, després, a l'acusada dependència econòmica, tecnològica i militar nord-americana. La tesi central d'aquest treball és que l'estratègia d'adaptació seguida per CASA va acabar reduint les capacitats i els coneixements, condicionant les possibles vies d'evolució a partir de mitjan dels anys 60 del segle passat. Per demostrar-ho, reconstrueix l'evolució i l'especialització de l'empresa des dels anys 40 fins a la tardana incorporació als projectes europeus cap al 1970 i exposa els factors polítics i institucionals que van motivar aquesta trajectòria.

PARAULES CLAU: resiliència, adaptació, indústria aeronàutica, franquisme

CODIS JEL: L62, N44, N64, N74

Construcciones Aeronáuticas SA (CASA), 1939-1972. Resiliencia y adaptación a la política de defensa y a las relaciones internacionales de España

RESUMEN

El objetivo principal de este trabajo es explicar la resiliencia de la empresa Construcciones Aeronáuticas S.A. (CASA) tras la Guerra Civil y cómo se adaptó a la situación de autarquía e intervencionismo durante el primer franquismo y a la acusada dependencia económica, tecnológica y militar estadounidense después. La tesis central del mismo es que la estrategia de adaptación seguida por CASA acabó reduciendo sus capacidades y conocimientos, condicionando las posibles vías de evolución a partir de mediados de los años 60 del siglo pasado. Para demostrarlo, reconstruye la evolución y especialización de la empresa desde los años 40 hasta su tardía incorporación en los proyectos europeos hacia 1970 y expone los factores políticos e institucionales que motivaron esta trayectoria.

PALABRAS CLAVE: resiliencia, adaptación, industria aeronáutica, franquismo

CÓDIGOS JEL: L62, N44, N64, N74