Datasets for combat aircraft

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Abstract

As part of their empirical investigation into factors contributing to the world-wide demand and supply of fixed-wing combat aircraft, the authors have conducted a search for data sources providing insight in the characteristics, types and qualities of aircraft designed for combat purposes, the total volume on the market (entries, movements and exits), as well as the financial equivalents of each in a specific period of time. This chapter discusses both the various pathways embarked on to this end, as well as the research results.

As a first step, literature regarding the demand and supply of combat aircraft has been studied. As it turns out, previous research on combat aircraft has focused either on general economic trends in the worldwide arms trade, often without a distinction in segments, or else on specific examples regarding political dimensions of the arms market, using combat aircraft as a case study. Although both foci are thought useful for this research, the first stream of research appears to contain more empirical data sources, therefore we have decided to select literature focusing on general economic in global arms trade to theoretically underpin this investigation.

Mostly, available data sources involve expenditure numbers, allowing no insights in the exact expenditure purposes. However, two sources in English literature allow for a connection between data and combat aircraft (i.e., the IISS Military Balance and SIPRI Arms trade)

database, as well as one source in Russian literature (i.e., the Centre for Analysis of World Arms Trade (CAWAT) World Arms Trade Statistics).

From literature, it appears empirical research regarding specific weapon systems has developed only relatively recently. Earlier studies applied separate weapon system counts as a measure to assess a country's military strength. At the time, Lambelet construed indices to assess the strategic power of the global power blocks using data on conventional and nuclear weapon stocks[1]. His ideas have gained many followers, especially concerning the arms race literature.[2] Ward shifted the methodology from counting nuclear weapon stocks to counting conventional weaponry only.[3] Diehl and Crescenzi, in their methodology overview on future arms races literature, express a strong preference for Ward's method .[4] Recently, in literature on segmentation between different weapons systems, the focus seems shifting from effect research to process research. For example, Caverley and Kapstein support their market analysis by regional trade data (amounts and cost price reflection) and a qualitative analysis of traded weapons systems (including combat aircraft).[5] Johnson has been the first to disaggregate major weapon systems into categories reflecting their strategic capabilities. His consecutive studies demonstrate that arms categories constitute a factor influencing interstate policy, both regarding procurement decision, as well regarding the political effects depending on the end to which arms are used.[6] To forecast future developments regarding Russia as an exporting country, Chizhov has studied the trends on the global market for fighter aircraft during the period 1950 to 2007. He concludes that the geopolitical situation, the level of

[1] Lambelet 1973
[2] Taagepera 1976 p. 67, Desai and Blake 1981; Luterbacher et al 1979; Kugler te al 1980; McGuire 1977; 1981; Stoll and Bolks 2000
[3] Ward 1984
[4] Diehl and Crescenzi 1998 p.116
[5] Caverley and Kapstein, 2016
[6] Johnson, 2017, 2019; Johnson & Willardson, 2018

military threat, scientific and technical progress and the level of regional economic development are factors influencing the fighter market.[7] From 2000-2009, Tsalikov has investigated the role and perspectives for Russia with regard to the multi-role fighters market. Based on this study, the Russian Federation has been advised on how to maintain its role as a leading state on the market. Tsalikov advises on future geopolitical cooperation and investment in Research and Development (R&D).[8] Saunders and Souva chose an altogether different theme, by redesigning the earlier notion of weapon systems counts as a proxy for military strength, and introducing a new dataset combining both quantitative and qualitative data on fighter, attack and trainer combat aircraft possession.[9] Rounds III, in the similar timeframe, studied fighter transfers, for better understanding of the relevance of state-to-state relationships in the demand and supply of combat fighter aircraft. [10]

When scrutinizing their data sources, we find Lambelet, Ward, Johnson, Saunders & Souva use the IISS Military Balance as their main dataset, whereas Caverley & Kapstein, Chizhov and Rounds base their inquiries on SIPRI Arms Trade data. Tsalikov uses CAWAT statistics.

As a next step, we proceeded to find out whether it might be possible to answer our research question based on the above mentioned three datasets. Unfortunately this proved not to be the case. IISS is useful for an indication of market size, market entries and exits, but lacks financial information. The SIPRI Arms Trade dataset provides an overview on market transfers and a cost indication of goods on the market –but lacks information on total volume on the market and transfer prices. CAWAT includes financial data, but lacks data before the year 2000. Although we have considered a combination of these three sources this has been

[7] Чижов (Chizhov) 2010
[8] Цаликов (Tsalikov), 2011
[9] Saunders & Souva, 2019
[10] Rounds, 2019

rejected due to the expected differences in definitions and methodologies and the probable requirement for additional data on market diversity and market prices.

Next, to theoretically underpin our research question, we have therefore embarked on another inquiry for new data sources, containing (1) information about the heterogeneity of combat aircraft, (2) the presence and numbers of aircraft available during a specific time frame, (3) aircraft entries to, movements on and exits from the market, as well as (4) any supporting financial data. In doing so, we are able to conduct an analysis of the information market concerning combat aircraft supply and demand.

This analysis has resulted in an overview containing 16 data sources, including SIPRI, IISS and CAWAT.

In the slipstream of the different pathways we took to search for relevant data sources, we gained additional insights into the multi-layered market of weapon system data and its broad range of customers with varying requirements. In itself, these insights deserve more in-depth analysis and despite all available information, it remains necessary to create a new dataset.