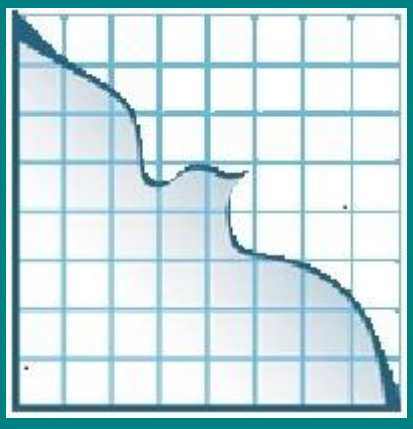
The Economics of Peace and Security Journal



The Economics of Peace and Security Journal — ISSN 1749-852X — http://www.EPSJournal.org.uk

THE ECONOMICS OF PEACE AND SECURITY JOURNAL

A journal of Economists for Peace and Security

Editorial Offices

EPS Publishing
c/o QuintServ Professional LLC,
PO Box 1039 Marietta, SC 29661, USA
Email: ManagingEditor@EPSJournal.org.uk

ISSN 1749-852X

Aims and Scope

The Economics of Peace and Security Journal (EPSJ) addresses business and economic aspects of peace and security, ranging from the interpersonal and communal domains to transboundary and global affairs. Our scope includes all violent and nonviolent conflict affecting human and nonhuman life as well as their implications for our common habitat, Earth. Special attention is paid to constructive proposals for nonviolent conflict resolution and peacemaking. While open to noneconomic approaches, most contributions emphasize economic analysis of causes, consequences, and possible solutions to mitigate conflict and violence. Contributions are scholarly or practitioner-based. Written and edited to fit a general-interest style, EPSJ is aimed at specialist and nonspecialist readers alike, including scholars, policy analysts, policy and decisionmakers, national and international civil servants, members of the armed forces and of peacekeeping services, the business community, members of nongovernmental organizations and religious institutions, and any other interested parties. No responsibility for the views expressed by the authors in this journal is assumed by the editors, by EPS Publishing, or by Economists for Peace and Security.

Economists for Peace and Security

Economists for Peace and Security (EPS) is a network of affiliated organizations. Each is legally independent and determines its own membership criteria and activities. A group of prominent individuals serve as trustees for EPS. They are: Clark Abt, George Akerlof*, Oscar Arias*, James K. Galbraith, Robert J. Gordon, Sir Richard Jolly, Richard Kaufman, Eric Maskin*, Daniel L. McFadden*, Roger Myerson*, George A. Papandreou, Robert Reich, Amartya Sen*, William Sharpe*, Robert Skidelsky, Robert M. Solow*, and Joseph E. Stiglitz*. Late trustees: Kenneth J. Arrow*, William J. Baumol, Barbara Bergmann, Andrew Brimmer, Robert Eisner, John Kenneth Galbraith, Sir Clive Granger*, Robert Heilbroner, Michael Intriligator, Walter Isard, Lawrence R. Klein*, Wassily Leontief*, Robert S. McNamara, Franco Modigliani*, Douglass C. North*, Thomas Schelling*, Robert J. Schwartz, Jan Tinbergen*, James Tobin*, and Dorrie Weiss. (*Nobel Laureate)

ISSN 1749-852X
https://www.EPSJournal.org.uk

VOL. 15, NO. 1 (2020) – CONTENTS

ARTICLES

Red flags for arms trade corruption

Sam Perlo-Freeman

Sam Perlo-Freeman is Research Coordinator at Campaign Against Arms Trade, London, United Kingdom. He may be reached at sam@caat.org.uk or smhwpf@gmail.com.

Abstract

The international arms trade is highly prone to corruption. Reasons for this include the size and technical complexity of deals, the secrecy and lack of transparency surrounding the trade and the broader military sector, and the crowded nature of the arms trade where exporting nations and companies are often desperate to make sales to maintain their business and technological capabilities. But which arms deals are most likely to be corrupt? This article considers some of the "red flags" for corruption in the arms trade, including those relating to the buyer, those relating to the seller, and those relating to the deal itself, most notably the use of agents or intermediaries, and the role of offsets. The article also argues that corruption in the arms trade is a function of its very close connection with political power in both the buyer and seller countries. Major arms deals are frequently regarded as being of strategic political importance by exporting governments, while opportunities for political finance are often a motivating factor for corruption for both buyers and sellers.

The international arms trade is highly prone to corruption. This article builds on Perlo-Freeman (2018), which discusses some of the key factors relating to the nature of the arms trade that make corruption so likely—in particular, the political-economic structure of the international arms industry and trade. These include: The large, technically complex nature of major arms deals; the secrecy and lack of transparency surrounding the arms trade; the nature of the contemporary arms trade as a buyer's market, in some sectors in particular, where many sellers are competing for scarce deals; the enormous incentive for arms supplier countries to sell at any cost to support their domestic industries; and the role of arms trade corruption as a key conduit for political finance in both buyer and seller countries.

This article extends this previous work in two ways. First, in analyzing and summarizing the key warning signs, or "red flags", that indicate a particularly high risk of corruption; second, in situating corruption as one element within the broader set of political, economic, and security relationships between buyer and seller countries. These networks of relationships often give rise to the biggest risk factor of all—governments and companies at the highest level make active decisions to engage in corruption, something which no amount of technical due diligence can overcome on its own. The conclusions in this article arise from several years of study by the author and colleagues at the World Peace Foundation (WPF) centered on the *Compendium of Arms Trade Corruption*, and other research; these include country case studies of Indonesia and Russia, and a thematic study of the role of arms trade corruption in political finance.[1]

Discussion of "corruption risks" or "red flags" sometimes seems to be framed as though corruption is the result of a series of traps that a well-intentioned company or government may stumble into if care is not taken. However, some of the major arms corruption cases—such as Saudi Arabia's Al Yamamah, the South African arms deal, or the numerous corrupt submarine sales by France and Germany—did not happen because of a failure of due diligence, but because corruption was sanctioned and executed at the highest levels. Such corrupt deals are typically facilitated by a complex network of shell companies, offshore accounts, and intermediaries. In many cases, the willingness of supplier

ISSN 1749-852X

governments to tolerate such practices was also a key enabling feature.

This is not to say that due diligence and strong anti-corruption policies and procedures are useless. Without them it is easy for smaller-scale corruption to occur at lower levels of a company, where eager sales agents are willing to cut corners to advance their careers. However, such due diligence procedures cannot in themselves help where corruption is a deliberate policy decision taken by a company's top management—who can establish ways round the policies applied at lower levels, ensure that relevant information does not reach compliance officers, and who may be difficult to challenge by more junior executives. Moreover, an exclusive focus on technical measures risks "missing the forest for the trees", by failing to address the fundamental political and economic drivers of high-level corruption.

Following a summary of arms trade corruption, this article reviews some of the existing literature on arms trade corruption and recaps some of the key conclusions arising from the *Compendium*. Subsequently there is a discussion of corruption risks related to the buyer, the seller, and to different aspects of an arms deal itself. This is followed by a consideration of the broader context of political relationships between buyers and sellers, and how the various red flags interact with one specific case study. Finally, a conclusion summarizes the integral nature of corruption within the framework of arms trading and where the warning signs may be found.

Corruption in the arms trade—what we know

The issue of corruption in the arms trade first drew political attention with the work of the Church Subcommittee on Multinational Corporations in 1975-76, which uncovered the Lockheed bribery scandal. A concrete result of this was the passage of the Foreign Corrupt Practices Act by the U.S. Congress in 1977, outlawing the bribing of foreign officials by U.S. persons and entities. In 1999, similar provisions were made by European countries following the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions. However, systematic coverage of the phenomenon was scarce until the 2000s. Greater interest from this time was spurred by

The arms trade is a political business, and corruption in the arms trade even more so. Understanding and assessing corruption risks ought to be seen from this perspective. Red flags signaling corruption, requiring differing levels of access, can be identified across the buyer, the supplier and the deal itself.

the major corruption revealed in "The South African Arms Deal", where there was a strong case for concluding that the opportunities for bribes *motivated* the deals (given the lack of a clear defense or security rationale for the major arms purchases). Corruption researcher and former oil industry executive Joe Roeber discusses the case and estimates that 40% of such international trade corruption as being related to the arms trade. He argued that the arms trade was "hard-wired for corruption" due to its secrecy, the enormous value of individual deals, offering life-changing opportunities for bribes of just a few percent, and the technical complexity of deals. In 2006 the U.K. Serious Fraud Office cancelled an investigation into potentially billions of pounds worth of corruption in the U.K.–Saudi Al Yamamah deal; further highlighting the crucial role of states in supporting and providing political cover for corruption in the arms trade. Feinstein (2011) and Guisnel (2011) delved further into the world of arms trade corruption with details of large numbers of major cases, illustrating the systemic nature of corruption in the business.[2]

The WPF has taken this work further through the *Compendium* of Arms Trade Corruption, and numerous subsequent publications. While not comprehensive, the *Compendium* brings together in one place a large number of cases (currently 41), using a common format, allowing for an analysis of key patterns that may emerge. It includes cases where there have been substantive public domain allegations of corruption, that have led in almost all cases to a serious legal investigation in one of the jurisdictions concerned (though not always conviction); or in the few remaining cases, to a substantive and well-founded media or civil society investigation. Cases have also been selected to provide examples, from different parts of the world and involving various different types of weapons systems. A significant lacuna is the limited number of arms deals in the *Compendium* where Russia

ISSN 1749-852X

is the exporter, and an absence of deals involving China—probably due to the limited possibilities for investigations. The *Compendium* has continued to be developed since its initial publication with 17 cases in 2017, and so is extending its capacity to support the drawing of meaningful conclusions and patterns.[3]

In a previous paper published in this journal, "Arms, Corruption and the State*"*, the author summarizes some of the key conclusions arising from the *Compendium* and other work by WPF on the subject. These include the finding that corruption in the arms trade is widespread, affecting both buyers and seller countries in all regions, developed and developing. Indeed, in some sectors, such as major combat aircraft and submarines, corruption seems to be so common as to be almost routine. It is apparent that strong institutions and democratic polity in a buyer country are not enough on their own to prevent corruption in major arms deals—countries with weak institutions are, however, prone to more extreme forms of corruption that go beyond bribery into outright embezzlement and fraudulent contracts. Corruption is also seen to be very difficult to prove, due to the multi-jurisdictional nature of investigations and the complex web of intermediaries typically used in corrupt arms deals. This is exacerbated by the extreme reluctance of governments in supplier countries to prosecute their own arms industry. There is evidence that U.S. arms companies are less likely to pay bribes to win arms deals. In part this is due to the effect of the Foreign Corrupt Practices Act (FCPA) and U.S. export control legislation which is stronger and better enforced than comparable European legislation (see the section under *Agents* later in this article). However, this is also due to the structural advantages the U.S. has in the international arms market and the lower level of export dependence of U.S. arms companies. Nonetheless, bribery by U.S. companies does occur in some cases. In the U.S., the issue of "legal corruption", or state capture, is highly pertinent. U.S. arms companies have little need to resort to illegal forms of corruption, with all the risks this entails, given the effective unlimited ability of U.S. corporations to fund political campaigns (through "Super-PACs") and to engage in lobbying, the "revolving door" between the Department of Defense (DoD) and industry, and the willingness of legislators to collude with the industry in padding defense budgets to create jobs in their districts. The domestic military budget already provides a huge market for arms companies' products and, frequently, on very lucrative terms.[4]

In "Arms, Corruption and the State", the author emphasizes the fundamental political motivations behind arms trade corruption from both the buyer's and the seller's point of view. For many exporters, the drive to export is an "existential need", as a means of maintaining capabilities in the domestic arms industry, in between relatively infrequent orders from the national armed forces. Without such exports, not only would unit costs be higher, but long production gaps might lead to a loss of key personnel and technical know-how, putting the viability of certain sectors of the arms trade in jeopardy. On the buyer's side, arms trade corruption is not only linked to the personal enrichment of key decisionmakers, but is also used as a source of political finance to fund election campaigns, political parties, and less formal patronage networks that shore up a politician's position. Moreover, sometimes the commission payments used to pay bribes may be partly diverted back to decisionmakers in the seller country—so-called "retrocommissions"—often to provide a means of covert funding for election campaigns. The role of arms trade corruption as a means of political finance renders it a means by which domestic political competition is conducted. Such deep embedding in state institutions makes arms trade corruption hard to tackle.[5]

Key warning signs ("red flags") for corruption in the arms trade

In the light of the above, major international arms deals can be argued as inherently involving a high corruption risk. However, certain aspects of deals make some more risky than others; in some cases, these aspects can readily be seen by outsiders, but other warning signs may only be readily known by those involved at a governmental or corporate level. These red flags for corruption may, in turn, be used to support due diligence efforts within governments and companies, or by NGOs, investigative

ISSN 1749-852X

journalists, and others, to externally scrutinize the arms business.

The following subsections discuss, corruption risks related to the buyer, to the seller, and to the deal itself.

Red flags related to the buyer

Transparency International's (TI) Defence and Security division produces an index, the Government Defence Anti-Corruption Index (or simply, the Government Index), which assesses the level of corruption risk in each country's military sector, based on a wide range of criteria. Countries are given a rating from A to F, representing a "very low" to a "critical" corruption risk. This rating is broken down into five categories: Political, financial, personnel, operations, and procurement. Procurement is most directly relevant to the arms trade, but the political and financial categories are equally important in framing the conditions for procurement.[6]

The most recent full survey, covering 115 countries, was published in 2015. Currently, TI are carrying out a new survey in a series of "waves", so far covering a number of countries in North and West Africa and the Middle East. In 2015, 81 out of 115 countries were rated "D" (high risk) or worse. If anything, the picture has worsened slightly in 2019 for the countries covered to date, with some countries (including Saudi Arabia) deteriorating from an E to an F.[7]

The 76 indicators in TI's five subcategories can be reasonably broken down into three key types of factor: *Transparency* (information availability); *decision-making processes* (institutions, laws, and procedures); and *monitoring, scrutiny, and oversight*. Table 1 summarizes some of the key aspects of these criteria.

A lack of information and transparency on military spending and procurement is a key red flag; if those outside government cannot know how money is being spent, and why, then it is much easier for corrupt payments to be hidden. This also applies when little or no information is provided on the details of arms deals.

The worst red flags for decision-making processes are where arms procurement deals are highly personalized—for example, at the sole discretion of the President or other top government leaders (as in many of the Gulf states receiving F grades), or alternatively being left to individual generals and admirals (as has been the case in Indonesia). However, even where more open processes exist, robust mechanisms for tendering, evaluation, due diligence, and appeals must be present. Frequent sole-source procurements without clear justification are a major red flag, as are opaque tender processes that can be manipulated in favor of, or against, particular bidders.[8]

The third key set of issues concerns who gets to monitor and scrutinize the spending and procurement processes. Generally, the more separate sources of scrutiny exist, and the more freedom and capacity they have to act, the better the prospects for restricting corruption. Moreover, oversight bodies must have sufficient access to information and resources in order to properly conduct their roles, and be as free as possible from political interference. Lack of such independent and resourced bodies is therefore a red flag. A free media and civil society are other crucial aspects of scrutiny; authoritarian rule stifling these is, in itself, a corruption red flag.

Red flags related to the supplier

A past record in engaging in corruption is the most obvious red flag related to a supplier. Unfortunately, most of the major European arms companies have a dismal record in this regard, which limits the discriminatory value of this criterion. Major companies featured prominently in the *Compendium* include Airbus (Germany), BAE Systems (U.K.), Dassault (France), Leonardo (Italy/U.K.), Naval Group (France), Rheinmetall (Germany), Rolls Royce (U.K.), Saab (Sweden), Thales (France), and Thyssen Krupp. U.S. giants Lockheed Martin and Boeing also feature, although in smaller and/or older cases. Israel's major arms companies, Elbit Systems, IAI, and Rafael are also prominently featured. Less information is available about Russian arms deals, but Rosoboronexport, the state arms export agency through which almost all Russian arms exports are conducted, has certainly been involved in corruption cases, including the "Azerbaijani laundromat".[9]

A potential red flag, however, could be the relative importance of the deal to the company in terms of its size

ISSN 1749-852X

Table 1: Key indicators relating to the buyer

Aspect	*Summary*
Transparency	Defense policy: Is there a publicly available document setting out perceived threats, defense strategy, missions of the armed forces, and resources required?
	Military budgeting and expenditure: Is the military budget publicly available? How much detail? Is there hidden or "off-budget" spending? Is actual spending reliably reported against budget?
	Procurement: Are procurement tenders and contracts published? Can the public know what is being bought, why, and for how much?
Decision-making processes	Who is involved in deciding procurement? Clear political control with democratic oversight. (Worst cases give senior officers free reign)
	Budget decided by executive and Parliament; no military "self-financing".
	Clear tender criteria based on needs assessment, widely publicized (including online)
	Open to all qualified bidders, with rigorous due diligence
	Single-source procurement rare, and with clear justification
	Robust processes for evaluating bids, with anti-corruption checks at all stages, and an appeals process
	Minimal political interference in evaluating bids—political role in establishing needs and allocating resources
Monitoring, scrutiny, oversight	By legislative committees (defense, public accounts)
	By internal auditors
	By national audit institution
	By national anti-corruption agency/state prosecutors
	By media and civil society groups
	Sufficient information, resources, and independence for oversight bodies

relative to overall turnover and profits or important to particular sectors of the company's business (especially where these concern capabilities). At a government level, importance may lie in facilities of particular political, industrial, or technological significance—for example, if the deal would ensure the preservation of a large number of jobs in a particular locality, or the maintenance of an industrial capability viewed as strategically important by

the company's home government. Such indicators could give a sense of the urgency for the company in making the sale, thus providing a strong motive to use any and all means to win the deal, as well as a strong political constituency to provide cover against future scrutiny. This would not, of course, provide any direct evidence of corruption in a specific case.

However, at the smaller end of the arms industry and trade, in particular in relation to domestic procurement rather than major international arms deals, there are a number of supplier-related red flags to look out for. These include companies that have: Only just established prior to applying for the tender; no track record in the type of business involved in the contract, and no relevant experience suggesting capacity to do the work; no evidence of employees, premises, a website, or financial records; directors involved in corrupt or criminal activity in the past; directors or beneficial owners that include politically well-connected individuals, such as friends and families of senior government or ruling party figures.[10]

The last point is not always readily apparent, as politicians and their associates may go to considerable lengths to hide their ownership of the company by use of anonymous shell companies registered in a jurisdiction that does not provide ownership information. Such anonymous shell companies are a major source of corruption in general, and are at present still legal in the United States, although the Corporate Transparency Act, which passed the House of Representatives in 2019, would ban them, requiring disclosure of companies' beneficial ownership for the first time.[11]

Transparency International Defence and Security are currently working on an updated version of their Defence Companies Anti-Corruption Index, based on a new methodology which will involve much more detailed scrutiny of companies' actual practices and implementation of anti-corruption policies, and the concrete actions they have taken to prevent corruption, (in contrast to the existing index which relates more to the existence of policies on paper). The new index, based on this methodology, has not yet been published, but the draft model questionnaire has.[12]

Red flags relating to the deal

There are many aspects of a deal which can raise red flags for corruption—here the focus is on two aspects that are frequently central to arms trade corruption: The use of agents or intermediaries, and the role of offsets.[13]

Agents: The vast majority of international corruption cases in the arms trade and elsewhere involve agents, or third-party intermediaries hired by companies to promote their offerings to the customer, often using corrupt means. Since the U.S. FCPA passed into law in 1977, almost 90% of cases reported under the act involved the use of agents. In the *Compendium*, out of 33 cases related to the international arms trade, 30 clearly involved the use of agents.[14]

While agents may perform a legitimate service in terms of providing useful local knowledge, very often the real purpose of an agent is to pay bribes to key officials and politicians. Most companies choose to channel bribes through intermediaries because they provide a layer of deniability between the company and the bribe recipient. The use of financial intermediaries, often anonymous shell companies, also helps make corruption on the company's part very hard to prove. Moreover, agents will often know exactly who needs to be bribed to secure a deal, or may themselves be politically well-connected, sometimes acting as a "gatekeeper" for access to key decisionmakers. Xiaodon Liang distinguishes between different types of agents according to their roles in the corruption process, including: *Sales agents*, who regularly act for a particular company on a regional basis; *national conduits* who are exceptionally well-connected individuals who are key to winning contracts in a particular country; *gatekeepers*, who are critical for gaining access to a particular individual with a leading role in arms procurement decisions; *money launderers*, who handle the financial side of corrupt transactions, ensuring the trail of payments is as hard to trace as possible; and *offset brokers*, who specialize in finding offset opportunities that can help a company win a deal, or fulfill their offset obligations (see below).[15]

Lockheed Martin has published a long list of red flags to use when conducting due diligence on third-party

ISSN 1749-852X

intermediaries hired in relation to export contracts. The Transparency International report, *License to Bribe* on the role of agents in arms trade corruption, covers similar ground. Some of the key red flags here include:[16]

- *Who the agent is*: Including past record of corruption, or if they use shell companies;
- *Who the agent knows*: If they are politically well-connected, and in particular if their connection to key public figures appears to be their primary qualification; and whether the agent's company has a politically connected beneficial owner;
- *What the agent does*: Whether there is little or no discernible legitimate work that the agent is doing in return for their fee, or if their terms of reference are extremely vague; whether their primary activity appears to be to lobby or influence public figures;
- *What and how the agent is paid*: Excessive fees, or fees are based on a share of deal value can be red flags here, as is the use of a shell company to pay the agent.

While the details of company agents are rarely visible to outsiders, one way in which potential corruption involving agents can be identified is through court records of disputes over payment between agents and the companies that hired them.[17]

One key element of the U.S. anti-corruption regime in relation to arms exports is contained in the U.S. Export Control Act, and the accompanying International Traffic in Armaments Regulations (ITAR). These require companies receiving export licenses, under the Direct Commercial Sales program, to declare any commissions, fees, and political contributions made in relation to the contract. This allows any such declared payments to be scrutinized, while discovery of undeclared payments (most probable in corruption cases) means legal exposure without any need to prove that the payments were intended or used for corrupt purposes (which is often very difficult).[18]

However, these requirements do not apply to sales made under the U.S. Department of Commerce 600 Series program, which includes most exports of military components and other lower-level military equipment.[19]

Offsets: Offsets are increasingly a standard and critical component of international arms deals and they are also highly prone to corruption.[20]

Paul Holden describes how critical the offsets package was to securing the South African Arms Deal, and how the benefits they promised to the South African economy proved to be largely a mirage. However, to those negotiating deals, their role as a potential channel of corruption may be their biggest advantage.[21]

Offsets were a feature of the corruption in at least 11 cases in the *Compendium*. Offset deals create enormous possibilities for corruption. They are typically far less transparent than even the arms deals they originate from, and details of offset-related contracts are very rarely published. They also create an extra layer of distance and deniability between the company and the corruption, enabling a company to claim to have no knowledge that the customer government was deliberately directing offsets to benefit particular individuals. Offsets create an expectation of a financial flow between the exporting company and the offset recipient, allowing bribes to be masked and rebranded as a payment related to an offset contract. There is further potential for corruption in the allocation of offset credits itself, as exemplified in the Portuguese submarine case. Perhaps most importantly, offsets provide for the distribution of very large benefits to a wide range of actors in the recipient country: Subcontractors, local partners in joint ventures, recipients of investments, companies involved in countertrade deals, and the many agents who may be involved in identifying and implementing offset deals.[22]

As anti-bribery legislation has strengthened, and more companies have faced investigation and conviction (although few serious consequences) for paying bribes to win arms deals, offsets have become increasingly attractive. They offer an exceptionally hard-to-detect, and eminently deniable, means by which corrupt benefits may be distributed to those that need to receive them to win a deal.[23]

Key individuals within the purchasing government

ISSN 1749-852X

may have considerable scope to decide how offset investments and contracts are allocated. They may use this scope to benefit their friends, family, or patronage networks. Offset brokers may also identify suitable politically connected recipients of offsets. The original exporter company may genuinely have no direct knowledge of the corrupt nature of some offset transactions, yet will benefit from them through their value in securing the deal. Again, a lack of beneficial ownership transparency (something which the U.S. Corporate Transparency Act is trying to address), along with the opacity of offset contracts, casts a veil of obscurity over the business that investigators may struggle to penetrate.[24]

While offsets in general represent a corruption risk (being present in almost all major international arms deals), a number of specific risks in offset programs can be identified:[25]

- *Who decides on the offsets?* Is the buyer government, or officials and politicians within it, in control of the details of the offset package, and able to direct offset transactions to specific companies?
- *Who are the offset recipients?* Who are the beneficial owners and directors of companies receiving offsets, and are they politically well-connected, in particular to decisionmakers for the main arms deal? Do these companies raise any of the "supplier" red flags listed above?
- *Who are the offset brokers?* The same questions must be asked of these as with any other agent or subcontractor.

The nature of offsets means that a large number of smaller local deals is generated from one large deal; each of these involves its own set of agents and decision processes which are subject to even less transparency than the original arms deal. Moreover, in each offset transaction there are two deals being made by the exporting company—one with the offset recipient, and a second with the buyer government, over the offset credits awarded for the transaction—creating two opportunities for corruption.[26]

Corruption within the arms trade political economy

"Arms transfers are best understood as 'reciprocal, bargaining relations' rather than 'separate unilateral acts of supplying and receiving'". A major arms deal is rarely just an arms deal. Very often, it is an expression of a long-term security and foreign policy relationship, and a signal of an alliance. Major arms deals frequently involve senior political leadership in both buyer and seller countries, and may help develop or maintain relationships between these elites, as well as between the countries' military establishments.[27]

During the cold war, arms trade relationships acted as a facet of superpower competition, and picking an arms supplier often meant choosing a side. The end of the cold war left the United States as the overwhelmingly dominant supplier in the global arms market, but also removed ideological barriers to arms sales, allowing buyers a wider choice between potential suppliers. Meanwhile, post-cold war cuts in military spending left the arms industries of most supplier nations much more reliant on exports, with the partial exception of the U.S., owing to the huge domestic demand for arms.

The political significance of arms sales remained, however. In particular, U.S. arms deals have often been sought as a means of developing a security relationship with the U.S., and a sign of entry into the U.S. alliance system, backed by security guarantees. This is especially the case in the Middle East and the former Soviet bloc. Except for countries that the U.S. regards as rivals or enemies, such as China and Iran, the U.S. is by far the dominant supplier to the Middle East and North-East Asia in particular.[28]

Arms exporters other than the U.S. therefore need additional selling points. The most obvious are those countries that the U.S. will not sell to, although this tends to mean most European countries will be similarly reluctant. Other selling points include: (1) cost, Russia and China in particular may be able to supply similar weapons to the U.S. at a lower price; (2) long-standing supplier-client relationships, such as Russia's status as the leading supplier to India; (3) desire to maintain a diversity of suppliers to avoid excessive dependence on one; (4) political relationships between individual

leaders, and broader elites (e.g., U.K.–Saudi Arabia); (5) offsets, and in particular technology transfer, whereby many buyers seek to develop their own arms industries, and with regard to which non-U.S. suppliers tend to be more forthcoming; and (6) corruption.

For producer countries, arms exports are a key means of shoring up the domestic arms industry, the strength of which is seen as essential for maintaining national power, and thus receive top-level support. A further motivation for arms exports is the real or perceived influence that may be gained on the recipient's behavior, especially in relation to the key foreign policy and security interests of the supplier. Dorminey and Thrall (2018) suggest that, even for the U.S., which is most able to wield such influence due to its dominant position, the effect is exaggerated. Additionally, Soubrier (2010) argues that in some Persian Gulf cases, the influence runs in the other direction due to the export dependence of the supplier. However, supplier governments may still perceive sealing a major deal as a foreign policy "win" that increases influence.

Major international arms deals are, therefore, intensely political affairs, involving leaders at the highest level on both sides, frequently heads of state or government, and represent broad "reciprocal bargaining relations". The potential for corruption is just one element of the package, but the close proximity of the deals to politics makes it a significant one, as it offers the possibility for funding political activities and rewarding allies. While the military value of weapons acquired is almost certainly a key factor, it is not necessarily the dominant one—particularly for the majority of countries that do not face any perceived existential threat. Military value is also highly context-dependent and subjective, and preferences may be easily overruled by larger political considerations.[29]

This understanding of the role of corruption gives a different frame in which to view the various red flags or warning signs for corruption. It is not so much a question of corruption "risks" or "vulnerabilities", but rather a matter of political choice, and the question is how different warning signs may indicate the role of corruption as part of the wider political bargain between the leadership of two countries.

Many cases in the *Compendium* illustrate the interplay between corruption and the wider political, economic, and security considerations that underpin major arms deals The next section illustrates the value of the red flag analysis, by focusing on one noteworthy recent series of arms deals, for which there is no current evidence of corruption, but which raises numerous red flags.[30]

Keeping the red flags flying—Qatar's massive hybrid fighter jet purchase

Qatar acquired three different types of major combat aircraft. First, Qatar signed a deal for 24 Dassault Rafales from France in May 2015 for EUR 6.7bn, followed by an additional 12 in December 2017 for an unknown amount. Then, in June 2017, Qatar ordered 36 F-15Q Strike Eagles from the United States, with an option for 36 more, in a deal worth up to USD 12bn. Finally, in September 2018, Qatar ordered 24 Eurofighter Typhoons from the U.K.'s BAE Systems, for GBP 5bn. This will bring about an eight-fold expansion in the Qatari air force, from 12 aging Dassault Mirage-2000 fighters to 96 fourth generation aircraft.[31]

It is hard to see how a country of Qatar's size (2.6 million, of which only 313,000 are citizens) could possibly find sufficient numbers of trained pilots to fly this many planes, and so foreign pilots will likely be required.

These acquisitions (excepting the first French deal) were the result of the major dispute that broke out in 2017 with its much more powerful regional Gulf neighbors, Saudi Arabia and the UAE, who along with Egypt have been unsuccessfully attempting to blockade the country since 2017. But aside from buying more planes than they can feasibly use, what is most questionable about the deals is buying three separate types of multirole aircraft, thus multiplying costs for training, operational support, and repair and maintenance, as well as problems of interoperability. Gareth Jennings of *Jane's* by IHS Markit argues further that the three planes are similar, with few unique capabilities that might explain the choice of a hybrid air force.[32]

However, there are other explanations, as one senior Qatari officer commented on the F-15 deal, "This is not a purchase, it is a strategic partnership". In the face of the potential threat from Saudi Arabia and the UAE, which may at one stage have come close to a military assault, Qatar is arguably seeking to buy friends and allies more than it is seeking to acquire usable aircraft.[33]

It is certainly plausible that Qatar would wish to shore up its alliance with the U.S. as a counter to potential threats from its neighbors. However, it is less clear what additional security guarantees are gained by buying additional planes from the U.K. and France, given the dominant U.S. role in the region; Qatar itself is host to the largest U.S. base in the Middle East, the Al Udeid air base, with 10,000 U.S. troops.[34]

Thus, such an expensive set of purchases with no conceivable military rationale, is in itself a major corruption red flag, and the explanation of seeking security guarantees through the strengthening of political and military relationships, offers only a partial explanation.[35]

Further red flags are raised on the buyer side. Qatar has been given the worst possible rank by TI's Government Defence Anti-Corruption Index—an "F" grade, indicating a "critical" risk of corruption, in both the 2015 and 2019 studies, with the procurement area being awarded a particularly low score of 6 out of 100 in 2019. Qatar is one of the least transparent countries in the world for military spending, having provided no information whatsoever on such spending since 2003 (even a total amount). Qatar is an absolute monarchy, where military affairs are essentially entirely at the discretion of the ruling emir, with no information provided to the public or parliament regarding defense policy, budgets and spending, or procurement. National procurement and tender laws do not apply to defense procurement. There is no oversight or scrutiny of defense matters, whether from parliament or national audit institutions. Procurement does not appear to follow any clear procedures or strategy, and is frequently made by direct single source arrangements with a chosen company. Essentially, it would appear that the Emir can make such purchases as he chooses, under whatever arrangements he sees fit.[36]

Red flags can also be raised regarding the suppliers of two sets of planes, BAE Systems and Dassault. BAE have a long history of corruption, including one 1996 deal with Qatar, where the company made a GBP 7m payment to three Jersey trust funds controlled by the then Qatari Foreign Minister. An investigation by the Serious Fraud Office was dropped in 2002, but Qatar agreed to pay Jersey GBP 6m for "perceived damage". Dassault, for its part, was given an "F" rating for anti-corruption policies and procedures in the TI Defence Companies Anti-Corruption Index in 2015, and has been engaged in numerous corruption cases. In 2017, Dassault were fined EUR 134m by Taiwan in relation to a 1992 deal for Mirage aircraft, for example. The late company President, Serge Dassault, who died in 2018, was himself convicted in relation to one such arms deal, and was suspected of vote buying as part of his political career in France.[37]

None of this in itself constitutes evidence of corruption. Pertinently, at present, there is no information available as to the mechanics of the deal; for example, use of agents or the role of offsets is uncertain. However, the general lack of transparency or rationality in the Qatari procurement process, together with the complete absence of military justification for the three aircraft deals, do raise major red flags. Meanwhile, whatever other motivations for the deal may exist, they are deeply entwined with the political relationships involved, and Qatar's efforts to buy allies to secure their precarious regional position. While there are red flags for the buyer, for the sellers, and for the deals themselves, it is impossible to disentangle any potential corrupt motivation from the wider political-strategic relationships at this stage. I would argue, however, that deals of this nature, that are so lacking in transparency and rationality, require a much deeper level of scrutiny from both the media and public authorities to ensure that they are not the subject of corruption.

Conclusion

Corruption should be seen as an integral part of the international arms trade, deeply intertwined with political, economic, and security relationships, and the drivers of the business. It is a feature, rather than a bug in the system, and often a policy deliberately pursued by governments and companies, instead of being the result of a failure of due diligence. Combating corruption in the arms trade therefore faces an uphill struggle against entrenched interests in both recipient and supplier countries.

A great many arms deals involve high level political bargaining, and major arms import decisions are rarely simply a technical matter of evaluating competing bids against objective criteria (on the basis of value for money). Thus, many deals may raise red flags, but disentangling potential corruption from the broader set of motivations is difficult.

Nonetheless, there are many specific warning signs that can indicate a particularly high likelihood of corruption. These relate to the buyer, in terms of levels of transparency and accountability, and robust laws, procedures and institutions. Seller warning signs manifest themselves in terms of past record and, finally, the contents of the deal itself can signal corruption. Supplier and deal warning signs are often the most difficult to ascertain from outside, unless information comes from whistleblowers or investigations by national authorities. Some of the most critical areas for potential corruption are the use of agents, who frequently act as conduits for corrupt payments, while offering a level of deniability to the seller company. Offset packages, perhaps, provide an even greater level of distance between the exporter and possible corrupt benefits to favored individuals and companies in the buyer country. In both cases, it is critical to question whether politically well-connected individuals in the transactions are acting as conduits to key decisionmakers and/or as potential beneficiaries to be rewarded by their patrons.

Ultimately, the arms trade is a political business, and corruption in the arms trade even more so. Understanding and assessing corruption risks should be seen within this framework.

Notes

1. See WPF (2017). The Compendium of Arms Trade Corruption (http://sites.tufts.edu/corruptarmsdeals) was first published online in May 2017. New entries have continued to be added up to July 2019 and existing entries continue to be updated as new information becomes available about the cases. The Compendium, and its component entries, is nonetheless referred to throughout this article as WPF (2017), based on the original date of publication.

2. Bribery scandal: See e.g., Solomon and Linville (1976); Jones and Berry (1977). Arms deal: Holden (2020). Arms trade: Roeber (2005).

3. The widespread and severe prevalence of corruption in the Chinese military sector is well-attested and discussed in an essay attached to WPF (2017), "China's crackdown on military corruption".

4. Conclusions: Perlo-Freeman (2018). FCPA: For the Foreign Corrupt Practices Act, see Department of Justice (2004). For a discussion of U.S. export control legislation as it relates to corruption, see Goodman (2019). Legal corruption: Discussed extensively in Smithberger (2018).

5. Motivations: Perlo-Freeman (2018). Existential need: Soubrier (2020). Patronage: Liang and Perlo-Freeman (2018). Retrocommissions: Retrocommissions may also be frequently used to enrich senior executives in the seller company, as the agents through who the bribes are paid may be required to cut the executives who appointed them into the deal. This is discussed in Guisnel (2011), but there is less clear-cut evidence of this in the cases covered in the Compendium.

6. Transparency International Defence and Security (2020).

7. Recent survey: TID&S (2015a). New survey: TID&S (2020). As of 24th March 2020, 19 countries have been covered in the new survey.

8. Liang and Perlo-Freeman (2017).

9. Beliakova and Perlo-Freeman (2018); OCCRP (2017).

10. Example cases of these red flags are illustrated in: Beliakova and Perlo-Freeman (2017); Sayne, Gillies and Watson (2017), in relation to the extractive industries sector; Anderson and [NAKO] (2018).

11. At the time of writing, the Act is at the Committee Actions stage with the Senate. See GovTrack (2019).

12. Current index: TID&S (2015b). New index: Dixon *et*

ISSN 1749-852X

al. (2018). Draft questionnaire: TID&S (2018); The questionnaire contains 60 questions relating to 10 areas: Leadership and organizational culture; internal controls; support to employees; conflict of interest; customer engagement (including political donations and lobbying); supply chain management; third parties (including agents); offsets; high-risk markets; and additional items applying to state-owned enterprises. Some of the items, such as publishing details of agents and intermediaries, as well as of offset brokers and offset obligations and transactions, that seem (to this author) unlikely to be met by any major arms company. Thus, it is likely that certain of the red flags identified by this index are likely to apply to most companies.

13. Perlo-Freeman (2019).

14. Stanford Law School (2020).

15. Liang (2020).

16. List: Lockheed Martin (2018). Agent role: Fish and Man (2016).

17. Holden (2018).

18. U.S. House of Representatives (2020); Directorate of Defence Trade Controls (2020).

19. Goodman (2019).

20. For a general discussion of the role of offsets in the arms trade, see Brauer and Dunne (2004). Offsets are a type of arrangement in international trade deals (most commonly arms deals) whereby the supplier company agrees to various spending and/or investment commitments in the buyer country to offset the foreign currency cost of the purchase. These may include:

> *Countertrade*, i.e., the direct purchase of goods and services (typically commodities) from the buyer country;
>
> *Subcontracting of components or services* for the equipment being supplied, to companies in the buyer country;
>
> *Investment in companies and industries* in the buyer country (this may be in the arms industry or unrelated industries);
>
> *Licensed production or final assembly* of some or all of the equipment supplied in the buyer country;
>
> *Transfer of technology and source code* for the equipment to the buyer country.

Offsets are described as *direct* when they are directly related to the main deal (e.g., subcontracting, licensed production), or *indirect* otherwise (e.g., countertrade, investment in unrelated industries).

21. Holden (2020).

22. For rebranding example, Holden (2018). Allocation: WPF (2017), "German Submarine Sales to Portugal.".

23. One ex-employee of a major U.S. arms company told the author that this company operated "in fear" of the FCPA in relation to direct corruption, but that offsets were how corruption could still happen—the allocation of offsets was often in the hands of the client, and the company did not need to know if some of these offset transactions were corrupt.

24. Liang (2020).

25. Some of these risks are discussed in a Fluker *et al*. (2012).

26. Holden (2020).

27. Quotation: Kolodziej (1979).

28. As can be seen from the data in the SIPRI Arms Transfers Database, for example. (SIPRI, 2020).

29. Reciprocity: Kolodziej (1979). Proximity: See preceding discussion, and Liang and Perlo-Freeman (2018).

30. Perlo-Freeman (2019).

31. Rafales: SIPRI Arms Transfers Database, SIPRI (2020). F-15Q: SIPRI Arms Transfers Database, (2020); Al Jazeera (2017). Typhoons: Young (2018).

32. Jennings (2018).

33. Comment: Knecht (2018). Assault: Then U.S. Secretary of State Rex Tillerson claims to have talked Saudi Crown Prince Mohammed bin Salman out of an attack in 2017. Al Jazeera (2018).

34. Wallin (2018).

35. It is possible that the Qatari government simply wanted to curry favor with as many western countries as possible, regardless of any specific future benefit, but this seems a fairly weak explanation on its own, and certainly does not exclude other, financial, benefits coming into the calculation.

36. "F" grade: TID&S (2020). Spending: SIPRI (2020). Arrangements: The Shura Council, which has 45 members, of which 15 are appointed by the emir, who can dissolve the Council and has the power to overrule its decisions. See TID&S (2020)

37. BAE: WPF (2017). Jersey payment: Campaign Against Arms Trade (2011); Burns and Pell (2007). Dassault "F": TID&S (2015b); and Shukla (2015).

ISSN 1749-852X

Taiwan fine: Altmeyer and Hepher (2017); see "Funding the Belgian Socialist Parties", WPF (2017). Conviction: McPartland (2014); and WPF (2017): "Funding the Belgian Socialist Parties".

References

Al Jazeera. 2017. "Pentagon: Boeing wins $6.2bn contract for Qatar's F-15." *Al Jazeera Online* [Doha]. 23 December 2017. https://www.aljazeera.com/news/2017/12/pentagon-boeing-wins-62bn-contract-qatar-15-171223192108186.html [accessed 24 March 2020].

Al Jazeera. 2018. "Rex Tillerson stopped Saudi and UAE from 'attacking' Qatar." *Al Jazeera Online* [Doha]. 1 August 2018. https://www.aljazeera.com/news/2018/08/rex-tillerson-stopped-saudi-uae-attacking-qatar-180801125651449.html [accessed 24 March 2018].

Altmeyer, C. and T. Hepher. 2017 "Update 1 – French Arms Firm Fined 227 mln Euros in Taiwan Dispute." *Reuters*. 25 October 2017. https://www.reuters.com/article/dassault-fine/update-1-french-arms-firms-fined-227-mln-euros-in-taiwan-dispute-idUSL8N1N07M1 [accessed 24 March 2020].

Anderson, E. and [NAKO] The Independent Defence Anti-Corruption Committee/Nezalezhny Antikorrupciynii Komitet z pytan oborony. 2018. "Six Red Flags: The Most Frequent Corruption Risks in Ukraine's Defense Procurement." London/Kiev: Transparency International Defence and Security/NAKO. http://ti-defence.org/wp-content/uploads/2018/09/Ukraine_Six_Red_Flags_Eng.pdf [accessed 26 March 2020].

Beliakova, P. and S. Perlo-Freeman. 2018. "Corruption in the Russian Defense Sector." World Peace Foundation Occasional Paper. 11 May 2018. Somerville, MA: World Peace Foundation. https://sites.tufts.edu/wpf/files/2018/05/Russian-Defense-Corruption-Report-Beliakova-Perlo-Freeman-20180502-final.pdf [accessed 26 March 2020].

Brauer, J. and P. Dunne, P. 2004. *Arms Trade and Economic Development: Theory, Policy and Cases in Arms Trade Offsets.* London: Routledge. https://doi.org/10.4324/9780203392300

Burns, J. and M. Peel. 2007 "SFO is 'actively' pursuing corruption allegations". *Financial Times* [London]. 8 February 2007.

Campaign Against Arms Trade. 2011. "BAE Systems Corruption Investigations and Plea Bargains." 18 May 2011. https://www.caat.org.uk/resources/companies/bae-systems/country-overviews [accessed 24 March 2020].

Civic Impulse LLC. 2019. "H.R. 2513: Corporate Transparency Act of 2019." *Civic Impulse LLC.* 23 October 2019. https://www.govtrack.us/congress/bills/116/hr2513 [accessed 24 March 2020].

[DDTC] Directorate of Defence Trade Controls. 2020. "The International Traffic in Arms Regulations" (ITAR)." website. Nd. https://www.pmddtc.state.gov/ddtc_public?id=ddtc_kb_article_page&sys_id=24d528fddbfc930044f9ff621f961987 [accessed 23 March 2020].

[DOJ] Department of Justice. 2004. "Anti-Bribery and Books and Records Provisions of The Foreign Corrupt Practices Act". United States Code Title 15, §78dd-1 *et seq*. Washington, D.C.: DOJ. https://www.justice.gov/sites/default/files/criminal-fraud/legacy/2012/11/14/fcpa-english.pdf [accessed 23 March 2020].

Dixon, K., C. Linney, M. Paukovic and A. Watson. 2018. "Out of the Shadows: Promoting Openness and Accountability in the Global Defence Industry." London: Transparency International Defence and Security. September 2018. https://ti-defence.org/wp-content/uploads/2018/09/Out_of_the_Shadows_WEB3.pdf [accessed 26 March 2020].

Feinstein, A. 2011. *The Shadow World: Inside the Global Arms Trade*. London: Penguin.

Fish, K. and M. Man. 2016, "Licence to Bribe? Reducing Corruption Risks around the Use of Agents in Defence Procurement." London: Transparency International Defence and Security. http://ti-defence.org/wp-content/uploads/2016/06/Licence-to-Bribe-web.pdf [accessed 26 March 2020].

Fluker, L., J. Muravska and M. Pyman. 2012, "Due Diligence and Corruption Risk in Defence Industry Offset Programmes." London: Transparency International Defence and Security. February 2012. http://ti-defence.org/publications/due-diligence-and-corruption-risk-in-defence-industry-offsets-programmes [accessed 26 March 2020].

Goodman, C. 2019. "Holes in the Net: US Arms Export Control Gaps in Combating Corruption." London: Transparency International Defence and Security. https://ti-defence.org/wp-

content/uploads/2020/01/US_Arms_Export_Gaps_in_Combatting_Corruption_v2d_digital.pdf [accessed 26 March 2020].

Guisnel, J. 2011. *Armes de Corruption Massive: Secrets et Combines des Marchands de Canons* [Weapons of mass corruption: secrets and tricks of the gun merchants]. Paris: Le Découverte.

Holden, P. 2018. "Investigating and Tracking the Global Arms Trade." London: Corruption Watch UK. https://docs.wixstatic.com/ugd/54261c_1f0bc83eeabf4207b4dcd10a4555d0a0.pdf [accessed 26 March 2020].

Holden, P. 2020. "Offsets, Corruption and Economic Performance: The View from South Africa and the World." *Economics of Peace and Security Journal*. Vol. 15, No. 1. pp. 20–30.

Jennings, G. 2018. "More Money than Sense? Qatar's Shopping Spree for New Fighters Continues Unabated." *Jane's* [London]. 17 January 2018. https://www.youtube.com/watch?v=pf5dIHzNvck [accessed 26 March 2020].

Jones, W.H. and J.F. Berry. 1977. "Lockheed Paid $38 Million in Bribes Abroad." *The Washington Post*. 27 May 1977. https://www.washingtonpost.com/archive/business/1977/05/27/lockheed-paid-38-million-in-bribes-abroad/800c355c-ddc2-4145-b430-0ae24afd6648/ [accessed 24 March 2020].

Knecht, E. 2018. "Qatar expects to receive six F-15 fighter jets from U.S. by March 2021." *Reuters*. 26 September 2018. https://www.reuters.com/article/us-qatar-defence-f15/qatar-expects-first-six-f-15-fighter-jets-delivered-by-march-2021-idUSKCN1NV1AV [accessed 24. March 2018].

Kolodziej, E. 1979. "Arms transfers and International Politics: the Interdependence of Independence." pp. 3-26 in R. Harkavy and S. Neuman, eds. *Arms Transfers in the Modern World*. New York: Praeger.

Liang, X. 2020. "A Typology of Third Parties in the Legal Arms Trade." World Peace Foundation Occasional Paper. Somerville, MA: World Peace Foundation. https://sites.tufts.edu/reinventingpeace/2020/04/07/a-typology-of-corrupt-third-parties-in-the-legal-arms-trade [accessed 7 April 2020]

Liang, X. and S. Perlo-Freeman. 2017. "Corruption in the Indonesian Arms Business: Tentative Steps Towards an End to Impunity." Somerville, M.A.: World Peace Foundation. https://sites.tufts.edu/wpf/files/2017/12/Corruption-in-the-Indonesian-arms-business-20171211-2.pdf [accessed 26 March 2020].

Liang, X. and S. Perlo-Freeman. 2018. "Arms Trade Corruption and Political Finance." Somerville, M.A.: World Peace Foundation. https://sites.tufts.edu/wpf/arms-trade-corruption-and-political-finance [accessed 26 March 2020].

Lockheed Martin. 2018. "Bribery and Corruption Red Flags." Bethesda, M.D.: Lockheed Martin. https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/ethics/corruption-red-flags.pdf [accessed 26 March 2020].

McPartland, B. 2014. "French Tycoon Dassault 'Grilled Over VoteBuying'." *The Local* [Stockholm]. 19 February 2014. https://www.thelocal.fr/20140219/french-tycoon-dassault-grilled-over-vote-buying [accessed 24 March 2020].

[OCCRP] Organized Crime and Corruption Reporting Project. 2017. "The Azerbaijani Laundromat". https://www.occrp.org/en/azerbaijanilaundromat/ [accessed 9 December 2019].

Perlo-Freeman, S. 2018. "Arms, Corruption, and the State: Understanding the Role of Arms Trade Corruption in Power Politics." *Economics of Peace and Security Journal*. Vol. 13, No. 2. pp. 37–46. https://doi.org/10.15355/epsj.13.2.37

Perlo-Freeman, S. 2019. "Red Flags and Red Diamonds: the Warning Signs and Political Drivers of Arms Trade Corruption." Somerville, M.A.: World Peace Foundation. https://sites.tufts.edu/wpf/red-flags-and-red-diamonds [accessed 26 March 2020].

Roeber, J. 2005. "Parallel Markets: Corruption in the International Arms Trade." Goodwin Paper no. 3. London: Campaign Against Arms Trade. https://www.controlbae.org.uk/background/parallel_markets.pdf [accessed 26 March 2020].

Sayne, A., A. Gillies and A. Watson. 2017. "Twelve Red Flags: Corruption Risks in the Award of Extractive Sector Licenses and Contracts." Washington, D.C.: Natural Resource Governance Institute. 6 April 2017, https://resourcegovernance.org/analysis-tools/publications/twelve-red-flags-corruption-risks-award-extractive-sector-licenses-and [accessed 26 March 2020].

Shukla, A. 2015. "Dassault Rapped for Poor Ethical, Anti-Corruption Monitoring." *Business Standard* [New Dheli]. 28 April 2015. https://www.business-

standard.com/article/current-affairs/dassault-rapped-for-poor-ethical-anti-corruption-monitoring-115042800016_1.html [accessed 24 March 2020].

Smithberger, M. 2018. "Brass Parachutes: the Problem of the Pentagon Revolving Door." Washington, D.C.: Project on Government Oversight. https://www.pogo.org/report/2018/11/brass-parachutes [accessed 26 March 2020].

Solomon, L.D. and L.J. Linville. 1976. "Transnational Conduct of American Multinational Corporations: Questionable Payments Abroad." Boston: Digital Commons @ Boston College Law School. https://lawdigitalcommons.bc.edu/cgi/viewcontent.cgi?article=1515&context=bclr [accessed 24th March 2020].

Soubrier, E. 2020. "The Weaponized Gulf Riyal Politik(s) and Shifting Dynamics of the Global Arms Trade." *Economics of Peace and Security Journal*. Vol. 15, No. 1. pp. 49–57.

Stanford Law School. 2020. "Third-Party Intermediaries." *Foreign Corrupt Practices Clearing House*. http://fcpa.stanford.edu/chart-intermediary.html [accessed 24 March 2020].

[SIPRI] Stockholm International Peace Research Institute. 2020. "SIPRI Arms Transfer Database". https://www.sipri.org/databases/armstransfers [accessed 24 March 2020].

[SIPRI] Stockholm International Peace Research Institute. 2019. "SIPRI Military Expenditure Database." https://www.sipri.org/databases/milex [accessed 26 March 2020].

Thrall, A. T. and C. Dorminey. 2018. "Risky Business: the Role of Arms Sales in U.S. Foreign Policy." Washington, D.C.: CATO Institute. 13 March 2018. https://www.cato.org/publications/policy-analysis/risky-business-role-arms-sales-us-foreign-policy [accessed 26 March 2020].

[TID&S] Transparency International Defence and Security. 2020. "Government Defence Anti-Corruption Index". https://ti-defence.org/gdi/ [accessed 23 March 2020].

[TID&S] Transparency International Defence and Security. 2015a. "Government Defence Anti-Corruption Index" http://government.defenceindex.org/#close [accessed 24 March 2020].

[TID&S] Transparency International Defence and Security. 2015b. "Defence Companies Anti-Corruption Index." http://companies.defenceindex.org/ [accessed 26 March 2020].

[TID&S] Transparency International Defence and Security. 2019. "Government Defence Anti-Corruption Index: Qatar, 2019." https://ti-defence.org/gdi/countries/qatar/ [accessed 26 March 2020].

[TID&S] Transparency International Defence and Security. 2018. "Defence Companies Anti-Corruption Index (DCI) 2019 Questionnaire and Model Answers (Draft)" London: Transparency International. https://ti-defence.org/wp-content/uploads/2018/04/DCI-2019-%E2%80%93-Questionnaire-and-Model-Answer-Document_v3.pdf [accessed 23 March 2020].

U.S. House of Representatives. 2020. "Control of Arms Exports and Imports". United States Code Title 22, §2278. https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title22-section2778&num=0&edition=prelim [accessed 23 March 2020].

Wallin, M. 2018. "US Military Bases and Facilities in the Middle East." Washington, D.C.: The American Security Project. https://www.americansecurityproject.org/wp-content/uploads/2018/06/Ref-0213-US-Military-Bases-and-Facilities-Middle-East.pdf [accessed 26 March 2020].

[WPF] World Peace Foundation. 2017. "Compendium of Arms Trade Corruption." https://sites.tufts.edu/corruptarmsdeals/ [accessed 24 March 2020].

Young, S. 2018. "BAE Systems Finalises Deal to Sell Typhoon Jets to Qatar". *Reuters*. 18 September 2018. https://uk.reuters.com/article/uk-bae-systems-qatar/bae-systems-finalises-deal-to-sell-typhoon-jets-to-qatar-idUKKCN1LY261 [accessed 24 March 2020].

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.20

Offsets in practice: The experience of South Africa

Paul Holden

Paul Holden is the Director of Investigations for Shadow World Investigations, London, United Kingdom. He may be reached at paul@shadowworldinvestigations.org.

Abstract

Numerous countries require that defense manufacturers commit to substantial offsets when defense materiel is purchased. However, there is extremely limited data regarding the economic efficacy or rationality of offsets. Recent disclosures related to South Africa's controversial 1999 "Arms Deal" about the economic performance of its sizeable offset obligations provides solid evidence that the manipulation of offset scoring systems allowed defense manufacturers to invest far less than originally contracted. The South African experience indicates that there are likely to be structural features inherent in all civilian offsets flowing from defense contracts that exert a downward pressure on the actual economic investments delivered by defense manufacturers.

Offsets are a major part of the global trade in weapons, with total global offset obligations known to be substantial. While no hard figures are available, one estimate suggests a global offset obligation of over USD 73bn for the defense and aerospace sectors in 2013.[1]

However, the importance of offsets is not matched by their degree of transparency, with offset programs being almost entirely shrouded in secrecy. As a result, it is both difficult to estimate the total size of outstanding offset obligations and to establish whether the economic benefits they promise actually materialize. Nevertheless, recent disclosures in South Africa related to its infamous and controversial 1999 "Arms Deal" provide a unique window into the day to day management of offset programs, their economic impact and the means by which offset-specific scoring systems can be abused. The manner in which the offsets data were manipulated necessarily implies that the positive economic impact of the Arms Deal offsets was considerably less than anticipated.

The 1999 South African Arms Deal

In December 1999, South Africa completed the purchase of a range of sophisticated military equipment. This included: Fighter and trainer jets supplied jointly by British Aerospace (now BAE Systems) and Saab; light utility helicopters supplied by Agusta; submarines provided by the German Submarine Consortium; and corvettes provided by the German Frigate Consortium. These purchases, and the scandals associated with them, have collectively come to be known colloquially as the "Arms Deal" in South Africa. Although the all-in costs of the deal remain opaque, the most recent credible estimates indicate that it is likely to have cost between ZAR 61.50bn (approximately USD 6bn) and ZAR 71.69bn (approximately USD 7bn) between 2000 and 2020.[2]

The Arms Deal was, and remains, extremely controversial, largely due to widespread and persistent allegations that corruption tainted all of its contracts and embroiled South Africa's most senior and powerful politicians.[3]

The importance of offsets in the South African Arms Deal

Offsets were central to the Arms Deal for three reasons. First, the Arms Deal was opposed by elements of civil society that questioned the need for post-apartheid South Africa to undertake the deal at a time of severe socio-economic strain. This argument had particular strength because South Africa's 1998 Defence Review, which set

ISSN 1749-852X
https://www.EPSJournal.org.uk

out the country's defense posture, confirmed that the greatest threats to the security of ordinary South Africans were crime, poverty and unemployment. The offset program was at the heart of the government's response to this criticism. Disclosures from the Government Communication Information Services (GCIS), the government body tasked with briefing the media on the deal, shows that placing offsets at the center of the announcement was the explicit strategy of the government. The announcement emphasized that the deal would generate over ZAR 100bn (approximately USD 10bn) of economic activity and create 65,000 jobs.[4]

Second, offset programs formed a large part of the discriminating criteria in choosing preferred bidders in the Arms Deal. Briefly, bidders were assessed according to three equally weighted domains: Technical suitability; the quality and terms of loan financing offered to cover the costs of purchase; and offsets. In a number of cases, the winning bidders relied on fulsome offset programs to boost their overall score and secure contracts, even though they were not considered to be the most technically suitable or the best value for money. It later emerged that in several cases (especially in relation to two steel mills that formed keystone projects for two bidders), the government had been advised that the promised offset projects were unviable. The government ignored these findings.[5]

Finally, offsets were expected to mitigate the potentially serious economic impacts of the import-heavy nature of the purchase. In August 1999, a team seconded from the Ministry of Finance produced an Affordability Report examining the long-term macroeconomic consequences of pursuing the Arms Deal. This report identified two major risks, namely, a negative market response that would lead to an increase in interest rates, and the non-fulfilment of offsets. Extensive modeling showed that the fulfilment of offset obligations was necessary in order to avoid severe negative economic consequences. In particular, the modeling showed that, if offsets were not substantially fulfilled, it would lead to the loss of 138,000 jobs, and reduce annual GDP growth by between 0.1 percent and 0.4 percent between 2001 and 2008.[6]

The poor economic outcomes from South Africa's 1999 "Arms Deal" illustrate structural features inherent in civilian offsets that exert a downward pressure on the actual economic investments delivered by defense manufacturers. The adoption of "package deals", the aggressive manipulation of multipliers and an overly generous interpretation of causality allowed the defense manufacturers to claim offset credits far in excess of the total investment in the economy.

The "Seriti" Commission of Inquiry into the Arms Deal

In 2011, President Jacob Zuma appointed a Commission of Inquiry into the Arms Deal with Supreme Court Judge Willie Seriti as its chair. The commission was empowered to investigate all aspects of the Arms Deal, including its rationality, allegations of irregularities and corruption, and whether contractors delivered on their offset obligations.[7]

In 2016, the Seriti Commission of Inquiry released its findings. They found that there were no irregularities or corruption in the Arms Deal and that the offset programs had been substantially fulfilled. The findings were widely regarded as a cover up. In August 2019, the High Court ruled that the commission had made no attempt to investigate the deal. Consequently, the High Court ordered that the commission's final report be set aside and disregarded.[8]

Despite the failure of the Seriti Commission of Inquiry to investigate the Arms Deal, it nevertheless provided a hitherto unforeseen level of disclosure regarding the civilian offset programs attached to the deal. Employees of the Department of Trade and Industry (DTI), which oversaw the civilian/indirect offset programs, were called to testify in public. Their witness statements and supporting documents were placed in the public domain. In addition, certain Commission employees attempted to properly investigate particular aspects of the Arms Deal (in the face of considerable institutional reluctance). The result of this was that, in relation to the offsets program, additional evidence was gathered from the DTI and subject to scrutiny. As a subpoenaed witness to the

Commission, the author was entitled to access certain of these documents; this has enabled an informed analysis of the extent to which offset obligations were meaningfully fulfilled.

An overview of offset obligations and credits awarded

In December 1999, the primary contractors in the Arms Deal entered into contracts with the South African government that set out their obligations in terms of the offset program. The offsets were divided into the Defence Industrial Participation (DIP) program and the National Industrial Participation (NIP) program. DIPs referred to the use of local contractors to produce elements of the purchased weapons systems (often referred to in the relevant literature as "direct" offsets). NIPs referred to investments into the civilian economy (known as "indirect" offsets).

NIPs accounted for the vast majority of the offset obligations incurred by Arms Deal contractors. Table 1 shows the total offset obligation incurred by each of them.

In evidence presented before the Commission, DTI employees stated that all of the major contractors in the Arms Deal had materially met their offset obligations. By the time the Commission had been appointed, the DTI had awarded the contractors the offset credits matching their obligations. The DTI had also verified that the contractors had created a large number of direct jobs, as shown in Table 2.[9]

Table 1: NIP/indirect offset obligations by contractor in the 1999 arms deal

Contractor	*Investments*	*Local Sales*	*Export Sales*	*Total*
BAE Systems/Saab	$2,000m	$1,560m	$3,640m	$7,200m
German Frigate Consortium and Thomson-CSF	$700m	$2,000m	$2,000m	$4,700m
Agusta	$185m	$115m	$468m	$768m
TOTAL $	**$2,8845m**	**$3,675m**	**$6,108m**	**$12,668m**
German Submarine Consortium	€960m	€251m	€1,642m	€2,852m
TOTAL €	**€960m**	**€251m**	**€1,642m**	**€2,852m**

Notes: $ values are USD. All currency values are rounded to millions.

Table 2: Offset credits awarded to Arms Deal contractors including jobs created

Obligor	*Jobs Created*	*Investment Credits*	*Sales Credits*	*Total*
BAE/Saab	7,172	$2,012m	$4,859m	$6,872m
GFC (Corvette Platform)	1,700	€517m	€1,545m	€2,062m
Thales (combat suite)	2,213	$199m	$591m	$791m
GSC	10,250	€961m	€2,156m	€3,118m
Agusta	958	$185m	$619m	$804m

Notes: $ values are USD. All currency values are rounded to millions.

Separating fact from fiction: The manipulation of the offset credit system

An uncritical examination of the figures in Tables 1 and 2, would suggest that the Arms Deal was an economic boon to South Africa, generating substantial

ISSN 1749-852X

investments, sales, and jobs. Sadly, the figures presented are not an accurate reflection of any economic reality.

The figures provided in Table 2 refer to the award of "offset credits" rather than actual sales or investment figures. Offset credits were awarded to contractors by the DTI based on evidentiary documents submitted to them by the Arms Deal companies. However offset credits were not awarded on a USD 1:1 basis—in other words, the award of USD 100m in investment offset credits did not mean that the obligor company had actually invested USD 100m.[10]

This was always the intention of the original negotiators of the Arms Deal contracts. According to one senior DTI official, Paul Jourdan, it was widely understood that investment credits were to be awarded on a USD 1:1 basis. Indeed, the underlying NIP contracts between the Arms Deal companies and the South African government stipulated a USD 1:1 scoring system. This was undertaken because the South African government negotiating team believed that if the USD 1:1 system was scrapped, "the targets would require little effort to be achieved."[11]

Very shortly after the December 1999 contracts were signed, the USD 1:1 system was abandoned. The Minister of Trade and Industry, Alec Erwin, directed that offset credits could be awarded based on multiple criteria. Erwin justified this approach by arguing that requiring obligors to meet their contractual obligations would lead to them recouping their outlay through hidden charges included in maintenance and lifecycle contracts. This startling admission is discussed in more detail later.

The introduction of a "floating" credit dollar introduced two primary means of inflating the offset credits awarded to the Arms Deal companies. First, was the use of "multipliers". Multipliers could be applied to the underlying investment or sale to produce a multiplied offset credit. Multipliers were offered for a range of reasons, such as the investment being designated as "strategic" by the DTI.

Second, was the introduction and use of what became known in the DTI as "package deals". These deals involved offering Arms Deal companies both large multipliers and upfront offset credits if the companies invested in a strategic project chosen by the DTI. The DTI justified this system by arguing that it could be used to convince the companies to invest in strategic projects that might carry an unusual level of risk. The DTI made package deals particularly attractive by stipulating that the offset credits would both be awarded upfront and would be irrevocable, regardless of actual economic performance of the project.[12]

The introduction of these two incentive schemes allowed Arms Deal companies to choose projects in a manner designed to maximize the offset credits that they were awarded. According to one investigation into Ferrostaal, a member of the German Submarine Consortium, it was reported that offset projects were explicitly chosen on the basis of their ability to earn multiplied credits, and not their underlying economic viability.[13]

The inflation of offset credits was also achieved through another mechanism, i.e., an incredibly generous interpretation of causality. All offset obligors were required to show that their investments "caused" a certain amount of economic activity. However, such causality and economic activity was open to wide interpretation and is demonstrated in the case studies described later in this article. Briefly, Arms Deal companies often invested in projects that had multiple sources of investment. Nonetheless, the Arms Deal companies argued before the DTI that the project would not have happened without their involvement. As a result, the obligors were awarded credits related to the total sum of investment in the project, rather than that portion for which the obligor was responsible.

The consequence of this was a clear and profound disjuncture between the number of offset credits awarded and the underlying economic activity that was generated. This was recorded by the DTI, which retained the underlying investment figures upon which the offset credits were calculated. Set out in Table 3, certain figures are worth highlighting. First, the total actual investment in civilian offsets amounted to USD 435m and EUR 104m, against which USD 2.39bn and EUR 1.47bn in investment credits were awarded. This is a multiplication

ISSN 1749-852X

factor of 5.49 for dollar-denominated offsets and 14.18 for those in euro.

Second, there was some notable variation in the success of different obligors in maximizing their credit dollars while minimizing their actual economic investment (highlighted in Table 4). The contractor who achieved the highest offset credit against actual investment was the German Submarine Consortium (GSC). GSC was awarded EUR 961m investment credits against EUR 59m in actual investment, a multiplier of 16.07. Thales, which provided the corvette suite for the corvettes as a partner to the German Frigate Consortium achieved the lowest multiplier of 1.42.

Finally, when added to local and export sales credits (see Table 5), the totals are even more striking: USD 8.46bn and EUR 5.1bn in total offset credits were awarded against actual investments of USD 435m and EUR 104m. This amounts to a total multiplication factor of 19.42 for dollar offsets and 49.69 for euro offsets. Again, the German Submarine Consortium achieved the highest multiplication factor: 52.13. Thales, the smallest offset obligor, achieved the lowest multiplication factor of 5.66.

Table 3: Offset credits awarded to arms deal contractors versus actual investment figures

Obligor	*Actual Investment*	*Investment Credits*	*Sales Credits*	*Total Offset*
BAE/Saab	$225m	$2,012m	$4,859m	$6,872m
Thales (combat suite)	$140m	$199m	$591m	$791m
Agusta	$71m	$185m	$619m	$804m
TOTAL $	**$436m**	**$2,396m**	**$6,070m**	**$8,466m**
GFC (Corvette Platform)	€44m	€517m	€1,545m	€2,062m
GSC	€60m	€961m	€2,156m	€3,118m
TOTAL €	**€104m**	**€1,478m**	**€3,702m**	**€5,180m**

Notes: $ values are USD. All currency values are rounded to millions.

Table 4: Investment offset credits awarded to arms deal contractors versus actual investment figures

Obligor	*Actual Investment*	*Investment Credits*	*Multiplier*
BAE/Saab	$225m	$2,012m	8.93
Thales (combat suite)	$140m	$199m	1.42
Agusta	$71m	$185m	2.60
TOTAL $	**$436m**	**$2,396m**	**5.49**
GFC (Corvette Platform)	€44m	€517m	11.62
GSC	€60m	€961m	16.07
TOTAL €	**€104m**	**€1,478m**	**14.18**

Notes: $ values are USD. All currency values are rounded to millions. Multiplier figures are truncated to two decimal places.

Case study 1: Denel Saab Aerospace

The Denel–Saab offset project was the single largest offset project in the entire NIP program. It accounted for just under a quarter of BAE/Saab's total offset obligations.[14]

The DTI pitched a project to Saab involving the South African state-owned Denel Aerostructures, which had long been a loss maker. The DTI encouraged Saab become a joint owner of Denel Aerostructures and use its expertise to undertake a management turnaround strategy that would guide Denel Aerostructures to profitability. Saab agreed to the project, forming a new entity, Denel Saab Aerospace (DSA).

ISSN 1749-852X

The DTI secured Saab's investment by offering Saab an exceptionally generous offsets package deal. Saab was offered upfront and irrevocable offset credits to the value of USD 1.5bn, of which USD 600m would count against BAE/Saab's investment obligation and USD 900m against local sales. Ultimately, BAE/Saab were granted USD 1.7bn offset credits, of which USD 600m was granted in relation to investment, USD 900m in upfront sales credits, and a further USD 204m in calculated sales credits. The amount actually invested by Saab into the project was minimal. Saab's total investment amounted to only USD 6.6m. BAE/Saab thus received a multiplier of 192.[15]

It is arguable that the project was a failure. The restructuring of the company did not lead to a change in the company's profitability, and after three years, the management agreement between Denel and Saab under which Saab would implement its management turnaround was cancelled. A subsequent independent external audit of the project found that if "one utilises the turnaround of the DSA as the ultimate goal and measure barometer for all of Saab's initiatives, then Saab has not delivered on its obligations in terms of the NIP credits awarded to it, which is evidenced by the cancellation of the management agreement and subsequent initiation of a new turnaround strategy."[16]

The DSA case study illustrates that the adoption of a package deal and the granting of upfront offset credits allowed Arms Deal companies to earn extraordinarily large offset credits for marginal economic investment. Moreover, because the offsets were irrevocable, they were granted despite the near total failure of the project.

Table 5: Total offset credits awarded to arms deal contractors versus actual investment figures

Obligor	*Actual Investment*	*Total Offsets*	*Multiplier*
BAE/Saab	$225m	$6,872m	30.49
Thales (combat suite)	$140m	$791m	5.66
Agusta	$71m	$804m	11.33
TOTAL $	**$436m**	**$8,466m**	**19.42**
GFC (Corvette Platform)	€44m	€2,062m	46.40
GSC	€60m	€3,118m	52.13
TOTAL €	**€104m**	**€5,180m**	**49.69**

Notes: $ values are USD. All currency values are rounded to millions. Multiplier figures are truncated to two decimal places.

Case study 2: MacArthur Baths and the package tourism project

The MacArthur Baths and the package tourism project is one of the most notable and well recorded examples of how the offset credit award system had almost no rational or justifiable connection to underlying economic reality.

This project involved two separate but related elements. First, Saab would invest in the rehabilitation of a heated swimming pool in the city of Port Elizabeth, a minor holidaymaker destination in the Cape. Second, Saab would engage a marketing company to advertise South Africa to Swedish audiences with the aim of increasing the number of Swedish tourists to the country. Saab invested USD 1.4m in the rehabilitation of the swimming pool. The amount Saab spent on the advertising campaign remains unknown as this was never disclosed to the DTI.

The pool aspect of the project was eventually awarded just over USD 1.4m in investment credits. The marketing aspect of the project was awarded USD 627m credits in respect of export sales. The sales credits were calculated on the differential increase in tourists from Scandinavian countries visiting South Africa up until 2011. It was estimated that each tourist visited for approximately 17 days, and that each tourist would spend USD 150 per day. The DTI agreed with Saab's contention that this increase was entirely due to the marketing campaign, which ran from 2002 to 2003. This was particularly problematic as South Africa hosted the 2010 FIFA World

Cup during the period under consideration.[17]

Moreover, the DTI and Saab made no effort to establish how many tourists visited Port Elizabeth, or if any of the tourists were aware of the marketing campaign. Considering that South Africa is globally renowned as a holiday destination, that the marketing campaign ran for no more than a year and only ran in Sweden, it is highly implausible that the differential increase in tourists from Scandinavia during the period between 2002 and 2011 was entirely based on this campaign.

Case Study 3: Evertrade Medical Waste

In 2001, a new company by the name of Evertrade Medical Waste was formed. The company was part owned by local South African shareholders and the United States company Stericycle. Evertrade aimed to introduce South Africa to a new medical waste processing technology, developed by Stericycle. The technology would treat medical waste with radio waves, precluding the need for the incineration of medical waste.

Evertrade received investment backing from the Industrial Development Corporation (IDC), a state-owned investment incubator. It also received a USD 4m grant from Thales as part of its offset obligations. As a result of this investment, Thales was granted substantial offset credits. In total, Thales was awarded over USD 171m credits, of which over USD 63m were investment credits and over USD 107m were sales credits. This was a total project multiplier of 42.[18]

Thales was granted the credits upfront and on an irrevocable basis, with no regard for whether the project was a success or not. Unusually, Thales' grant was recorded in a memorandum of understanding entered into between Thales and Evertrade, according to which the grant was given on the condition that Thales received the full upfront credits on an irrevocable basis. This was curious as Evertrade was not responsible for awarding credits; this responsibility lay with the DTI. Nevertheless, this agreement was retrospectively approved by the Minister of Trade and Industry. This was highly irregular and strongly suggests that the Minister was convinced to accept this figure by Evertrade or Thales, without the DTI engaging in any feasibility or other studies.

Evertrade collapsed soon after it was founded. In 2004, Stericycle sold its shares in the company. Shortly thereafter, authorities in Johannesburg and Cape Town found that Evertrade had failed to properly dispose of the medical waste it was supposed to have treated under contract. Waste including used needles, amputated limbs, soiled bandages and fetuses was found abandoned in plastic bags outside of Evertrade's premises. By the end of 2004, Evertrade had ceased to operate.[19]

Other failed projects: A calculation

The Evertrade case was sadly not the only failed offset project that, for various reasons, still received a vast quantity of offset credits. Over and above DSA and Evertrade, five further projects materially failed as going concerns (as far as the DTI was willing to disclose)—usually in extremely controversial or criminal circumstances. Excluding DSA, the six remaining identified projects were granted USD 1.3bn in offset credits. When DSA is included, this calculation increases to a figure of just under USD 3bn. This is equal to 35 percent of all the dollar-denominated offset projects.

The politics of offset compliance: Rent and reputation

During the Seriti Commission of Inquiry the former Minister of Trade and Industry, Alec Erwin, sought to justify the introduction of multipliers and package deals in relation to civilian offsets. In so doing, Erwin ironically, and possibly unwittingly, developed a powerful critique of the economic and political rationale behind offsets, and therefore deserves being quoted fully:

> "NIP is essentially a form of commercial partnership where the obligor and the DTI (on behalf of the buyer) are attempting to achieve differing objectives. The obligor wants to maximize the 'credit dollar' with the minimum amount of money it has to put forward and the DTI is trying to maximize investment with no real interest in who supplied the investment. In theory, for

ISSN 1749-852X

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.20

> the obligor the maximum amount of money that it would be prepared to pay in is what it values as the economic rent of being the equipment supplier. For the DTI it wants to maximize investment (and other objectives as I will deal with later) but it cannot push this too far otherwise the obligor will seek redress in finding means to increase price over the lifecycle of the equipment in order to secure its required profit level."[20]

This admission on the part of the Minister in charge of all Arms Deal offset obligations about the *realpolitik* calculations in the management of offset programs is worthy of consideration. It could form a useful frame of reference when examining the global experience of offset credits. Certainly, it strongly suggests that there is a potential power imbalance between arms purchasing countries and offset obligors as the former may be held captive to punitive escalations in cost should the latter decide its offset obligations are too onerous.

However, Erwin's characterization fails to consider another material factor that further tilts the scale in favor of arms companies—the potential embarrassment or political difficulties caused by the failure of offset programs. In the Arms Deal, it is highly likely that informal pressure was placed on DTI employees to ensure the award of the largest number of offset credits possible.

These two concerns of punitive cost escalation and the threat of reputational damage are inherent in the nature of offset agreements; although the relative weights of reputational damage vary depending on the political importance placed on offsets in the prelude to the agreement of new purchases. These concerns are therefore *structural* and *acute* elements of all indirect offsets around the world. Together, they combine to exert a downward pressure on the real economic investments that can be achieved by arms procuring countries.

The actual economic impact of the Arms Deal offset program

The information unearthed as a result of the Seriti Commission of Inquiry raises a number of questions that extend beyond the scope of an article such as this. But perhaps the most pressing question is whether a determination can be made as to the actual economic impact of Arms Deal offset programs.

Two facts are immediately apparent: First, the Arms Deal offset program did lead to investment in the South African economy. The direct investment figure was equal to USD 435m plus EUR 104m over the course of approximately 11 years, or roughly USD 40m and just under EUR 10m per year.

Sadly, the sales figures are so opaque and based on such distorted and confused data that it is almost impossible to extract any realistic sense of the true value of total sales. However, it would be fair to believe that some sales did indeed materialize.

Second, as a counterpoint, the investment made by Arms Deal companies was considerably less than what was originally envisaged by the DTI negotiators (who had attempted to exclude multipliers and other distortions from the program). Indeed, it was over USD 2.4bn and EUR 856m less than originally agreed upon (15 percent of the intended dollar value investment and 10 percent of the intended euro value).

These two facts allow one to draw two inferences. First, there was money flowing into the South African economy due to the inflow of investment funds. As such, it would be reasonable to expect that this would have had some economic impact, even if measuring it would be difficult based on the available data.

The second inference is based on the fact that government modeling prior to the Arms Deal indicated that there would be severe and profound economic repercussions should offset obligations not be substantively met. This modeling was performed on the basis that multipliers and package deals would not be used in awarding offset credits. It is reasonable to conclude that the amount of offsets delivered was a fraction of what the modeling predicted as necessary to avoid negative economic impacts. Assuming the correctness of the modeling, it would also be reasonable to infer that whatever economic benefit accrued to the government, through the inflow of investment funds, would have been insufficient to offset the negative economic effects of pursuing a major domestic

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.20

acquisition that was both import-heavy and non-productive.

That said, this is a matter requiring a deeper and more intensive study that would include attempting to establish the success and failure of individual offset projects on a case-by-case basis.

Conclusion

The disclosure of offset data following the Arms Deal's NIP programs shows that there was major and profound disjuncture between the offset credits awarded to Arms Deal companies (the purported economic impact) and the actual and material investments made by those same companies into South Africa's economy (the actual economic impact). The adoption of "package deals", the aggressive manipulation of multipliers and an overly generous interpretation of causality allowed the defense manufacturers to claim offset credits far in excess of the total investment in the economy. Existing data does not allow a full calculation of the real economic impact of the civilian offsets program attached to the Arms Deal. However, it is incontrovertible that the existing data shows that the economic impact was far less than had been promised, and a fraction of the total value of offset credits awarded.

The South African experience of offsets suggests that there are structural features inherent in the delivery, management, and monitoring of civilian offset programs attached to large defense procurements. In particular, the threat that defense manufacturers may implement punitive cost escalations if offsets are monitored too stringently, and the potential for political embarrassment where offsets are not delivered, exerts a downward pressure on the actual investments required.

In this regard, the South African example of offsets must act as an information-rich warning that exuberant claims about the economic impact and efficacy of civilian/indirect offsets must be viewed with both caution and skepticism.

Notes

1. IFBEC (2016, p. 16).
2. Arms Deal: There is substantial literature on the Arms Deal, corruption, and its political implications. Holden (2008); Holden and Van Vuuren (2011); Feinstein (2008); Crawford-Browne (2007); Taljaard (2012); Dunne and Lamb (2004); Dunne, Nikolaidou and Lamb (2019). Cost: Holden and Feinstein (2017, p. 222).
3. Holden and Van Vuuren (2011).
4. Threats: The 1998 Defence Review affirmed that "the government has adopted a broad, holistic approach to security, recognizing the various non-military dimensions of security and the distinction between the security of the state and the security of people. The greatest threats to the South African people are socio-economic problems like poverty and unemployment, and the high levels of crime and violence." South African Department of Defence (1998, paragraph 28). Announcement: The GCIS strategy documents were disclosed as a result of successful litigation brought by Dr. Richard Young to access documents stemming from an investigation into the Arms Deal by South Africa's Auditor-General. They are described in detail in Holden and Van Vuuren (2011).
5. The impact of using offsets as a discriminating criterion in the selection process, and the government's knowledge that certain keystone projects would ultimately be unviable, was made public knowledge after Richard Young's successful litigation to access draft reports from the Auditor-General. The draft reports detailed the problematic handling of offset modeling and scoring, and how offset scores were manipulated to benefit the ultimate winning bidders. These findings are described in detail in Chapters 3, 4 and 5 of Holden and Van Vuuren (2011).
6. The Affordability Report was classified but was eventually leaked, inter alia, to the author of this article. The content and findings of the report are described in considerable detail in Chapter 8 in Holden and Van Vuuren (2011).
7. South African Department of Justice (2011).
8. No irregularities: Arms Procurement Commission (2016). Set aside: Mlambo, Davis and Leeuw (2019).
9. The total credits awarded and jobs "created" by each NIP program was attached as Annexure A to the witness statement of Sipho Zikode before the Inquiry Into Allegations of Fraud, Corruption, Impropriety or Irregularity in the Strategic Defence Procurement Package. This was provided to the author as an "interested party" to proceedings.

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.20

10. The manner in which offset credits were assessed and awarded was also addressed in the witness statement of Sipho Zikode and the additional witness statement of Mr. Zimela—both provided to the author as an "interested party" to proceedings.

11. Jourdan (2014).

12. The use of multipliers and "package deals" were addressed in the witness statement of Sipho Zikode and the additional witness statement of Mr. Zimela to the Seriti Commission—both of which were provided to the author as an "interested party" to proceedings.

13. Debevoise and Plimpton (2011).

14. Extrapolated from Annexure A to the witness statement of Sipho Zikode before the Inquiry Into Allegations of Fraud, Corruption, Impropriety or Irregularity in the Strategic Defence Procurement Package—provided to the author as an "interested party" to proceedings.

15. The Denel Saab Aerospace figures were included in an extended memorandum written by a senior evidence leader to the Seriti Commission of Inquiry, who was in charge of leading an investigation into the offsets program. The memorandum was based on an audit of the underlying DTI files and other materials. The memorandum was handed up in session to Judges Seriti and Musi and was subsequently provided to the author as an "interested party" to the proceedings.

16. Failure: See Note 15. Audit: Holden and Feinstein (2017, p. 237).

17. These figures and the method of calculation were included in an extended memorandum written by a senior evidence leader to the Seriti Commission of Inquiry, who was in charge of leading an investigation into the offsets program. The memorandum was based on an audit of the underlying DTI files and other materials. The memorandum was handed up in session to Judges Seriti and Musi and was subsequently provided to the author as an "interested party" to the proceedings.

18. See Note 17.

19. The full details of the Evertrade story are included in Holden and Van Vuuren (2011, pp. 280–285).

20. Erwin (2014).

References

[Arms Procurement Commission] Commission of Inquiry Into Allegations of Fraud, Corruption, Impropriety or Irregularity in the Strategic Defence Procurement Package. 2016. "Final Report: Volume 3." Pretoria, South Africa: DoJandCD. https://www.justice.gov.za/comm-sdpp/docs/20160624-gg40088_gon742-ArmsCommReport.pdf [accessed 10 December 2019]

Crawford-Browne, T. 2007. *Eye on the Money: One Man's Crusade Against Corruption*. Johannesburg, South Africa: Umuzi.

Debevoise and Plimpton LLP. 2011. "Ferrostaal: Final Report, Compliance Investigation." *European Citizen's Logos* [Athens]. https://kassios.files.wordpress.com/2012/10/confidential-secret-report-findings-re-ferrostal-greek-gov-case-pribes1.pdf [accessed 3 August 2019]

Dunne, J.P. and G. Lamb. 2004. "Defence Industrial Participation: The Experience of South Africa," pp. 284–298 in J. Brauer and P. Dunne, eds. *Arms Trade and Economic Development: Theory Policy and Cases in Arms Trade Offsets*. Oxford, U.K.: Routledge. https://doi.org/10.4324/9780203392300_chapter_19

Dunne, J.P., E. Nikolaidou and G. Lamb. 2019. "South Africa and its Defence Industry." pp 547–570. in K. Hartley and J. Belin, eds. *The Economics of the Global Defence Industry*. Oxford, U.K.: Taylor and Francis. https://doi.org/10.4324/9780429466793-26

Erwin, A. 2014. "Witness Statement: Commission of Inquiry into Allegations of Fraud, Corruption, Impropriety or Irregularity in the Strategic Defence Procurement Package." Author's personal collection.

Feinstein, A. 2008. *After the Party*. Jeppestown, South Africa: Jonathan Ball.

Holden, P. 2008. *The Arms Deal in Your Pocket.* Jeppestown, South Africa: Jonathan Ball.

Holden, P. and A. Feinstein, A. 2017. "Joint Submission to the People's Tribunal on Economic Crime." Johannesburg: The People's Tribunal on Economic Crime. https://corruptiontribunal.org.za/site/wp-content/uploads/2018/02/AD1-Joint-Submission-to-the-Peoples-Tribunal-Paul-Holden-and-Andrew-Feinstein-final.pdf [accessed 20 January 2020)

Holden, P. and Van Vuuren. 2011. *The Devil in the Detail: How the Arms Deal Changed Everything*. Jeppestown, South Africa: Jonathan Ball.

[IFBEC] International Forum on Business Ethical Conduct. 2016. "Offsets in the Aerospace and Defence Industry." Amsterdam: Global Kinetics.

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.20

http://www.global-kinetics.com/wp-content/uploads/2016/02/IFBEC-Offsets-Report.pdf [accessed 23 July 2018]

Jourdan, P. 2014. "Witness Statement." Author's Personal Collection.

Mlambo, Davis and Leeuw. 2019. "Judgment in Corruption Watch and Another v Arms Procurement Commission and Others." Cape Town, South Africa: SAFLII. http://www.saflii.org/za/cases/ZAGPPHC/2019/351.html. [Accessed 12 December 2019]

South African Department of Defence. 1998. "South African Defence Review." GCIS Document 201409. Pretoria, South Africa: DoD. https://www.gov.za/sites/default/files/gcis_document/201409/defence-review1998.pdf [accessed 10 April 2010]

South African Department of Justice. 2011. "Terms of Reference of the Commission of Inquiry into Allegations of Fraud, Corruption, Impropriety or Irregularity in the Strategic Defence Procurement Package (SDPP)." Document GG 34731, Notice R926. Pretoria, South Africa: The Arms Procurement Commission. https://www.justice.gov.za/comm-sdpp/docs/20111104-gg34731-r926-terms-comms.pdf [accessed 20 January 2012]

Taljaard, R. 2012. *Up in Arms: Pursuing Accountability for the Arms Deal in Parliament*. Johannesburg, South Africa: Jacana.

Arms for export? A reappraisal of the Brazilian arms industry

Diego Lopes da Silva

Diego Lopes da Silva is a Researcher, SIPRI Arms and Military Expenditure Program, Stockholm International Peace Research Institute (SIPRI), Stockholm, Sweden. He can be reached at diego.lopes.silva@outlook.com.

Abstract

There is a near-consensus among scholars and policymakers that the principal factor leading to Brazil's arms industry crisis was its dependence on exports. However, the diffusion of the arms export-dependence argument contrasts with the lack of empirical support for it. Currently, there are no recent studies consistently estimating the overall size of Brazil's arms production nor its reliance on external markets. Without a proper measurement of Brazil's domestic procurement capacity, any assessment of its external dependence is only partial. To address this issue, this article uses data on domestic procurement previously introduced by the author to re-evaluate Brazil's dependence on arms exports. While certainly important, the export-dependence argument has been overstated. Indeed, a fall in demand in the late 1980s led to a major decrease in Brazilian arms exports. However, the state managed to absorb a significant part of the production until mid-1990s. The data on domestic procurement sheds new light on institutional explanations for Brazil's arms industry crisis.

In 1986, Peter Lock wrote "Brazil: Arms for Export", providing a comprehensive overview of one of the biggest arms exporters at that time. The title itself clearly expressed the important role that external markets had in the development of Brazil's arms industry.[2]

Just a few years after the publication, the Brazilian arms industry entered a period of stagnation that finally led to its crisis in the mid-1990s. Once a thriving producer of armored vehicles, Engesa went bankrupt in 1993. Embraer, the country's greatest arms company, was privatized in 1994 to cope with financial losses. Avibrás, responsible for the commercial success of the Astros II multiple launch rocket system, did not make a single export between 1993 to 1999. There is a near-consensus, among scholars and policymakers, that the principal factor leading to this arms industry crisis was its dependence on faltering exports.[3]

In the 1980s, the arms export-dependence argument led Brazil to a rather loose commitment to arms exports control. In an interview given in 1979, a Brazilian general argued that if a government "knocks on our door looking for guns and we, for whatever political reasons, refuse to supply, what will happen? It will look for another [supplier]". This "if-not-us-someone-else-will" rationale ultimately led to Brazilian arms being found in the hands of unauthorized third parties without end-user certificates. An example is the use of Brazilian-made Urutu and Cascavel armored vehicles by the Guatemalan government against the Guatemalan National Revolutionary Unit during the civil war. In the 2010s, Brazil displayed a somewhat hesitant position toward the Arms Trade Treaty (ATT)—which can largely be attributed to its perception that the treaty would limit the number of foreign markets. Both the Ministry of Defense and the Ministry of Foreign Affairs expressed concerns that the restrictions imposed by the ATT could jeopardize Brazil's efforts to rebuild its arms industry.[4]

The export-dependence argument is at the heart of Brazil's recent efforts to regain its former status in the arms trade. Since the early 2000s, the Brazilian government has led the effort to rebuild the country's arms production capacity. Military spending grew substantially alongside an emerging policy apparatus to foster the sector. The enactment of the National Defense Strategy in 2008 and its later revisions regard exporting arms as a crucial step toward the industry's recovery. The

ISSN 1749-852X

document asserts that "the Brazilian state will help to gain foreign clients for the national defence material industry". The state-backed export offensive has also been framed as helpful to the country's economy, linking it to Brazil's economic and technological development.[5]

The diffusion of the arms export-dependence argument among scholars, as well as its use for policy making, contrasts with the lack of empirical evidence supporting it. Without a proper measurement of Brazil's domestic procurement capacity, any assessment of its external dependence is only partial. To address this issue, this article uses data on domestic procurement introduced by Lopes da Silva (2018) to analyze Brazil's dependence on arms exports. While this issue has been briefly addressed in Lopes da Silva (2020), here the discussion is extended, comparing the estimates provided in Lopes da Silva (2018, 2020) with previous studies. The contribution of this article is twofold. First, it addresses a gap in the arms production literature, namely estimates of domestic arms procurement. Second, by doing so, this article aims to inform the policy debate regarding Brazil's dependence on arms exports.

Brazil and the arms trade

Foreign markets are considered to be crucial for arms industries. Exporting allows the scaling up of production in order to mitigate the fixed production cost burden. Securing foreign markets is therefore often a priority for emerging arms producers. Kurç (2017) discusses the active role the Turkish state has taken in promoting arms sales abroad as a means of improving production capabilities. Brazil is no different, with the role of exports dominating explanations for both the rise and demise of its arms industry. Lock's (1986, p. 81) account of the Brazilian arms industry identifies arms exports as the main factor driving the sector.[6]

Libya was Brazil's first important arms recipient with Brazil filling a gap left by the United States and the United Kingdom (who halted exports to Libya after Muammar al-Qaddafi's rise to power in 1969). Brazilian armored vehicles, such as the Urutu and Cascavel, served Qaddafi's plans to increase Libya's combat capabilities.

The outbreak of the Iran-Iraq war in 1980 was deeply

This article questions the near-consensus that Brazil's arms industry collapse in the 1990s was due to faltering export markets. Examining domestic procurement, in addition to exports, weakens the export-dependence argument ,and weakens those seeking state support for the industry as well as those seeking arms export expansion.

tied to Brazil's arms industry. Arms exports to Iraq fueled the industry's growth and the conflict became a showcase for Brazilian-made military equipment. Throughout the war, arms exports became increasingly concentrated in Iraq—the country received 28.1 per cent of all arms exports from Brazil between 1975 and 1988. By the mid-1980s, Brazil had 0.65 percent of the world total arms exports, a very small figure compared to established exporters, yet higher than other emerging arms producers. However, when the conflict ended in 1988, Brazil was lost its main recipient.[7]

While other aspects certainly had a role, like the transition to democracy, there is a near-consensus in the literature that export dependence was the principal factor leading the industry's crisis in the 1990s. Gouvea (2015, p. 138), for instance, argues that the sharp decline in demand for military hardware in the late 1980s exposed Brazil's heavy dependence on exports. Financial constraints are said to have limited Brazil's ability to absorb its indigenous production.[8]

The export-dependence argument moved beyond academic circles into the very core of policymaking. The necessity to export is frequently voiced in official documents and is the cornerstone of Brazil's arms industry revitalization process. Magalhães (2018) discusses how the military sector has used Brazil's arms export-dependence to lobby for larger fiscal incentives and a more active role of the state in promoting military sales abroad. The enactment of the Special Tributary Regime for Defense Industry (RETID in its Portuguese acronym) in 2012 relieved the sector from several taxes, setting forth special rules for procurement, contracting and product development.[9]

Furthermore, Brazil's dependence on foreign markets has been used to justify a rather loose arms export control policy, leading to occasional divergences with the

ISSN 1749-852X

country's peace-promoting foreign policy guidelines. By overemphasizing the benefits of exporting arms, such as economic returns or the very existence of an indigenous production capacity, commitments to international norms are diluted. Ávila (2011) highlights the irreconcilable predicament of Brazil's arms trade policy: On the one hand, Brazilian foreign policy regards itself as peace promoting, whereas on the other, it aims to regain its place as one of the main arms exporters in the world. These two objectives are often in stark disagreement, if not mutually exclusive at times. Nevertheless, they coexist in a strange paradox justified by the alleged absolute necessity to export arms.[10]

Arms for export? Examining a narrative

Albeit compelling, the export-dependence argument demands a proper assessment. Surprisingly, it has not been confronted with data on domestic procurement; thus, there is no systematic empirical account of the Brazilian case supporting the predominance of foreign markets vis-à-vis domestic demand. To some extent, the absence is justified by the scarcity of data. Currently, neither the arms trade nor the arms industry databases provided by the Stockholm International Peace Research Institute (SIPRI) include data for domestic procurement.

Recently, the need for data on domestic procurement has received due attention. Brzoska (2019) compares three different methods to estimate overall arms production. His aim is not to provide actual figures, but rather to discuss different possible ways to calculate output. Previously, Bove and Cavatorta (2012) tried to estimate domestic procurement in financial values using military expenditure data. An indirect approach is seen in Smith and Tasiran (2010), which tries to measure domestic production capability as the unobserved effects it may exert on arms imports propensity.[11]

This article makes use of the dataset introduced in Lopes da Silva (2018), restricted only to the Brazilian case. It provides a feasible and straightforward strategy to build a consistent time series on domestic arms production, where arms production equals domestic procurement plus arms exports.

Using Trend Indicator Values (TIVs), Lopes da Silva (2018) tracks domestic acquisitions for South America. By using TIVs, an estimate of total arms production can be achieved by adding exports to domestic purchases (excluding equipment not locally produced or assembled). TIVs are based on the known unit production costs of a core set of weapons and represent a transfer of military resources rather than financial values. This method intends to provide a standard unit to allow the measurement of trends in the flow of arms to countries and regions over time.

Figure 1 shows Brazil's military spending and total arms production in TIVs, disaggregated by domestic procurement and exports. The inclusion of domestic procurement leads to a reappraisal of foreign markets and a revision of some estimates used in the literature. To illustrate Brazil's reliance on arms exports, Moraes uses (2012) data from Krause (1992, p. 164) on Brazilian exports of military equipment as a share of total production in the mid-1980s, ranging between 70 to 80 per cent. This estimate is close to the data in Figure 1. However, given that estimates for an extended time-series were unavailable, Moraes (2012) generalizes the predicament, assuming the share of exports would be roughly the same for other years. Figure 1 challenges that assumption.

Maldifassi and Abetti (1994) present data of domestic arms procurement in Brazil between 1969 and 1988 based on a Minimum Costs per Soldier criterion. Domestic arms production levels are based on Dollars Per Soldier (DPS), which is given by:

$$DPS = \frac{military\ budget - arms\ imports}{number\ of\ military\ personnel}$$

For the 20-year period covered, the minimum DPS value found was assumed to represent the minimum possible expenditures per soldier that would allow the armed forces to operate. The authors assume that when DPS was at its lowest point, military spending concerned only arms imports, minimum operational expenses, personnel costs, and infrastructure maintenance—thus excluding domestic arms procurement. Anything above that minimum would be attributed to domestic purchases.

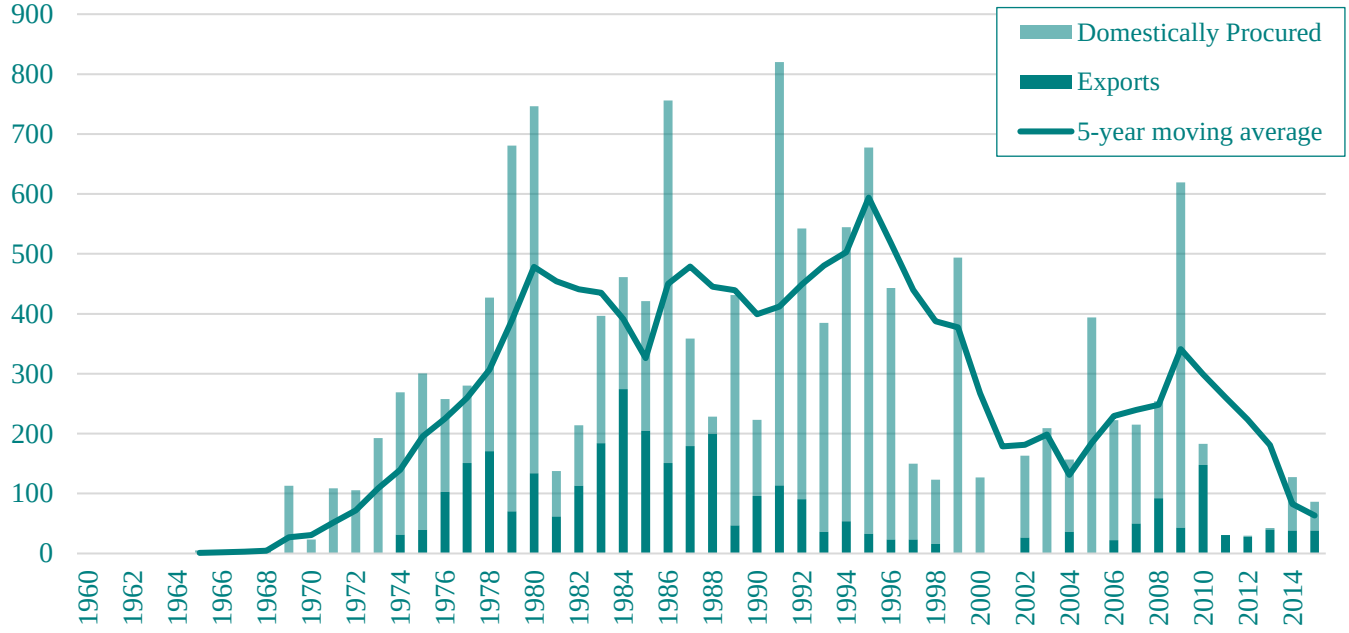


Figure 1: Brazilian arms production.
Sources: Arms exports: SIPRI. Domestic procurement: author's calculations. *Note:* Domestic arms procurement, exports and 5-year moving average are in millions of TIV dollars at 2015 constant prices.

Table 1 compares Maldifassi and Abetti (1994) estimates with those built using data from Lopes da Silva (2018). One of the main differences between the two methods is that, whereas Maldifassi and Abetti use only military spending figures, Lopes da Silva registers individual arms deliveries. Also, measurement units are distinct, as the latter uses Trend Indicator Values. To make both estimates comparable, a share of overall arms production is used.[12]

Before discussing the data, some caveats are necessary. Using TIVs to track domestic procurement has clear advantages in comparison to other methods. It builds on a consolidated methodology and, for that same reason, it is comparable to SIPRI's arms trade database. Yet there are limitations, including the considerable shortcoming of disregarding changes in production costs of the same equipment over time. In addition, it was mentioned earlier that TIVs are not financial units. In that sense, their use alongside other variables such as military spending or gross domestic product in econometric analysis is limited.[13]

Also, although the dataset for Brazil's domestic procurement is consistent, it is not complete. However, it is argued that unregistered purchases are small and so do not alter the conclusions presented here. Furthermore, the figures presented here are a preliminary exploration into Brazil's reliance on domestic procurement. Future studies are needed to disaggregate these data to account for variation across sectors. Brazil's naval industry is primarily oriented toward domestic procurement, whereas the majority of armored vehicles are exported. As TIVs for ships are higher, this inflates domestic procurement figures. While the presented aggregate measures are valuable, these concerns need to be borne in mind.

Both the Maldifassi and Abetti, and Lopes da Silva estimates seem coherent regarding the timing of main events: Exports began in the mid-1970s, increasing in importance in the 1980s. For some years, estimates are close; in 1978, 1981, 1984, and 1986 they differ by just a few percentage points. Maldifassi and Abetti, however, are less consistent, with significant jumps between years;

ISSN 1749-852X

Table 1 – Comparison of Brazilian arms production estimates

	Lopes da Silva (2018)				*Maldifassi and Abetti (1994)*			
	A	*B*	*C*	*D*	*A*	*B*	*C*	*D*
1969	113	0	113	0	2555.7	0	2555.7	0
1970	23.6	0	23.6	0	3967	0	3967	0
1971	109	0	109	0	4377.2	0	4377.2	0
1972	105.3	0	105.3	0	4440	0	4440	0
1973	192.7	0	192.7	0	5007.3	0	5007.3	0
1974	237.9	31.3	269.2	11.6	5698.2	0	5698.2	0
1975	260.7	39.6	300.4	13.2	6053.5	131.5	6185	2.1
1976	154.7	103.0	257.7	40	2119.9	333.7	2453.6	13.6
1977	129.4	151.1	280.4	53.9	1939.3	80.5	2019.8	4
1978	256.2	170.9	427.1	40	422	329.8	751.8	43.9
1979	610.4	70.2	680.6	10.3	0	333.7	333.7	100
1980	612.5	134	746.5	17.9	498.6	388.7	887.2	43.8
1981	75.8	61.6	137.4	44.8	596.7	429.9	1026.6	41.9
1982	101.2	112.9	214.1	52.7	2051.2	1607.6	3658.8	43.9
1983	212.4	184	396.4	46.4	1332.8	298.4	1631.1	18.3
1984	186.7	274.5	461.3	59.5	1048.2	1436.8	2485	57.8
1985	216.4	205	421.3	48.6	1220.9	773.4	1994.3	38.8
1986	605.2	150.9	756.1	20	2037.5	565.3	2602.8	21.7
1987	179.6	179	358.6	49.9	2308.3	1217	3525.3	34.5

Notes: A = Domestic procurement, B = Exports, C = Total production (A+B), D = Exports as a share of total production.

Source: Lopes da Silva (2018) provides figures in SIPRI Trend Indicator Values (TIVs) expressed in millions of dollars at 2015 constant values. Maldifassi and Abetti (1994) figures are in millions of dollars at 2015 constant values.

the tenfold increase in exports as a share of total arms production from 1977 to 1978 is particularly notable. The main divergence between the datasets concerns domestic procurement in the late 1970s. According to Maldifassi and Abetti, domestic procurement slowed down between 1976 and 1982, reaching zero in 1979. In contrast, Lopes da Silva finds that, domestic procurement has, in the main, increased in the same period (led by the acquisition of armored vehicles such as the Cascavel and the Urutu). Maldifassi and Abetti missed these purchases because the baseline value used to estimate the minimum Dollars Per Soldier ($3,929 in 1979) already included the acquisition of domestically produced equipment. That is, the assumption that the minimum value of Dollars Per Soldier for their time series covered only basic costs of maintenance and operation was flawed, something that the authors themselves had anticipated as a possibility.[14]

It is of note that both sets of estimates are similar in not overstating the role of exports. As an average, both

ISSN 1749-852X

are very similar: 24.4 per cent in Maldifassi and Abetti, and 26.8 for the TIV-based calculations. Thus, neither estimates provide support for the overstatement of Brazil's arms export dependence. Certainly, as with other arms producers, Brazil's reliance on foreign markets is an important feature of its arms industry; nevertheless, its importance has been overstated. This finding does not invalidate the role played by arms exports; however, it is sufficient to reassess its importance and to strengthen alternative explanations of Brazil's arms industry. Kapstein (1991), for instance, states that the Brazilian arms industry was not established as an export sector from its inception. Instead, its primary goal was to meet the domestic requirements of the military. This article's findings also strengthen Conca's (1997) institutional explanation of the industry crisis as the erosion of the arms industry's supporting coalition after redemocratization.

Conclusion

Arms export dependence must be analyzed cautiously. Without a proper assessment, it can ultimately justify hesitant commitments to arms trade regulations. The demise of Brazil's arms industry has been attributed to its alleged overwhelming reliance on external markets. Nevertheless, studies have mostly relied on anecdotal figures for domestic procurement vis-à-vis exports. Thus, conclusions have been presented without a solid empirical basis. One must be aware that this narrative is convenient for those who wish to expand the influence of the arms industry while seeking greater support from the state for their enterprises.

Using data from Lopes da Silva (2018), Brazil's reliance on arms exports is examined. The figures on domestic procurement do not debunk the role of exports in maintaining Brazil's arms industry, but it does reappraise its importance. The export-dependence argument has been overstated. While the end of the Iran-Iraq war did, indeed, lead to a major decrease in Brazilian arms exports, the state managed to absorb part of the production until the mid-1990s. Recent data indicates that, despite Brazil's efforts to rebuild its arms industry, output is still significantly smaller than that achieved in the 1980s. The data on domestic procurement gives grounds for reconsidering Brazil's current strategy to rebuild its arms industry. It also sheds new light on alternative explanations for Brazil's arms industry crisis, such as those provided by Conca (1997) and Kapstein (1991).

It is beyond the scope of this article to discuss the intricacies between domestic procurement and arms exports. Indeed, state demand can vary depending on how external markets behave. Albeit that this demands attention, the goal of this article is to discuss figures for domestic procurement and compare them with previous estimates. A proper assessment of how these two elements interact (for example, if the expectation of increasing exports affects domestic procurement) would require a specific in-depth study. Such a task would greatly benefit from the estimates presented here.

The method used here to calculate Brazil's domestic arms procurement, and thus its overall arms production output, is promising. Recently, Brzoska (2019) compares different methodologies with the same purpose and concludes that, despite the substantial effort required, estimates using TIVs are likely to produce valid results. Nevertheless, one must be aware of the limitation of using TIVs. Brazil does not have a unified report on arms exports or domestic procurement. Thus, data collection is demanding and likely to overlook smaller trades. Likewise, as mentioned in Brzoska (2019), TIVs measure weapons systems, excluding small weapons. This is a an especially significant problem as Brazil is a world-leading small arms producer. For that reason, a TIV-based method leads to underestimation by excluding this part of the industry.[14]

Future research can benefit from comparing Brazilian estimates for domestic arms procurement to other arms producers. Comparative studies could provide interesting insights on the role of state demand. Also, when data is available, adapting the Trend Indicator Value to small arms could improve the accuracy of estimates while also providing a more comprehensive toolkit to measure the arms trade. Expanding TIVs to small arms is a challenging task, however. Frequently, data is not available, making comparisons problematic—

ISSN 1749-852X

however, a case-by-case approach could lead to insightful results.

Notes

I would like to thank the participants of "The Politics and Economics of the Global Arms Trade" workshop, hosted by the World Peace Foundation in May 2019, for their valuable comments and specially Sam Perlo-Freeman for the invitation. Also, I want to thank the EPSJ editors and reviewers for their helpful comments on improving the text.

1. Lock (1986).

2. Maldifassi and Abetti (1994); Franko, (1998); Dagnino (2010).

3. Quote: within Avila (2009, p. 309). Brazilian armored vehicles in Guatemala: Avila (2011). Brazilian position on ATT: Magalhães (2018).

4. The National Defense Strategy 2008: [PR] (2008). Economic and technological development: [MD] (2012).

5. Scaling up production to mitigate fixed costs: Hartley and Sandler (2003); Kurç and Neuman (2017); Neuman (1984); Neuman (2006); Sandler and Hartley (1995). The rise and demise of Brazil's arms industry: Gouvea (2015); Franko (2014); Kapstein (1991).

6. Showcasing Brazilian-made military equipment: Dagnino (1989).

7. Transition to democracy: Conca (1997); Principal factor: Brigagão (1986); Dagnino (1989); Dagnino (2010); Franko-Jones (1991); Moraes (2012). Absorbing indigenous production: Lock (1986); Dagnino (1989); Dagnino (2010); Moraes (2012).

8. Arms industry revitalization: Dagnino (2010); Dagnino and Campos Filho (2007).

9. Justifying loose arms export control: Magalhães (2018, p. 272).

10. On domestic procurement: Brzoska (2019); Hartley (2018); Lopes da Silva (2018).

11. For the remainder of this section "Maldifassi and Abetti" refers to Maldifassi and Abetti (1994), and "Lopes da Silva" refers to Lopes da Silva (2018).

12. Lopes da Silva (2018) discusses the shortcomings of TIVs in more detail.

13. Maldifassi and Abetti (1994, p. 167).

14. Dreyfus *et al*. (2010)

References

Avila, C.F.D. 2009. "Armas Brasileiras Na América Central Brazilian Arms in Central America." *Varia História*. Vol. 25, No. 41, pp. 293–314. https://doi.org/10.1590/S0104-87752009000100015

Avila, C.F.D. 2011. "O Brasil, a Política Nacional de Exportação de Material de Emprego Militar – PNEMEM – e o Comércio Internacional de Armas: Um Estudo de Caso." *Tempo.* Vol. 16, No. 30, pp. 221–41. https://doi.org/10.1590/S1413-77042011000100010

Bove, V. and E. Cavatorta. 2012. "From Conscription to Volunteers: Budget Shares in Nato Defence Spending." *Defence and Peace Economics* Vol. 23, No. 3, pp. 273–288. https://doi.org/10.1080/10242694.2011.563973

Brigagão, C. 1986. "The Brazilian Arms Industry." *Journal of International Affairs*. Vol. 40, No.1, pp. 101–14.

Brzoska, M. 2019. "Combining Data on Military Demand and Supply for Arms Production Estimates." *The Economics of Peace and Security Journal*. Vol. 14, No. 2, pp. 42–54. https://doi.org/10.15355/epsj.14.2.42

Brzoska, M. and T. Ohlson, eds. 1986. *Arms Production in the Third World*. London: Taylor & Francis.

Conca, K. 1997. Manufacturing Insecurity: The Rise and Fall of Brazil's Military-Industrial Complex. London: Lynne Rienner.

Dagnino, R. 1989. *A Indústria de Armamentos Brasileira: Uma Tentativa de Avaliação.* Campinas, Brazil: Universidade Estadual de Campinas.

Dagnino, R. 2010. *A Indústria de Defesa No Governo Lula*. São Paulo: Expressão Popular.

Dagnino, R. and L.A.N. Campos Filho. 2007. "Análise Sobre a Revitalização Da Indústria de Defesa Brasileira." *Brazilian Business Review* Vol. 4, No. 3, pp. 191–207.

Dreyfus, P., Lessing, B., de Sousa Nascimento, M. and J.C. Purcena. 2010. Small Arms Survey *Small Arms in Brazil: Production, Trade, and Holdings*. Geneva: Graduate Institute of International and Development Studies.

Franko-Jones, P. 1991. *The Brazilian Defense Industry*. Boulder, CO: Westview Press.

Franko, P.M. 1998. "The Puzzle of Brazilian Arms Production." *Journal of Interamerican Studies and World Affairs*. Vol. 40, No. 4, pp. 137–43. https://doi.org/10.2307/166458

Franko, P.M. 2014. "The Defense Acquisition Trilemma: The Case of Brazil." *Strategic Forum* No. 262, pp. 1–12.

Gouvea, R. 2015. "Brazil's New Defense Paradigm." Defense and Security Analysis. Vol. 31, No. 2, pp. 137–51. https://doi.org/10.1080/14751798.2015.1038452

Hartley, K. 2018. "Arms Industry Data: Knowns and Unknowns." The Economics of Peace and Security Journal. Vol. 13, No. 2, pp. 30–36. https://doi.org/10.15355/epsj.13.2.30

Hartley, K. and T. Sandler. 2003. "The Future of the Defense Firm." *Kyklos.* Vol. 56, No. 3, pp. 361–80. https://doi.org/10.1046/j.0023-5962.2003.00225.x

Kapstein, E.B. 1991. "The Brazilian Defense Industry and the International System." *Political Science Quarterly*. Vol. 105, No. 4, pp. 579–96. https://doi.org/10.2307/2150936

Krause, K. 1992. Arms and the State: Patterns of Military Production and Trade. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511521744

Kurç, Ç. 2017. "Between Defense Autarky and Dependency: The Dynamics of Turkish Defense Industrialization." *Defense Studies.* Vol. 17, No. 3, pp. 260–81. https://doi.org/10.1080/14702436.2017.1350107

Kurç, Ç. and S.G. Neuman. 2017. "Defense Industries in the 21st Century: A Comparative Analysis." *Defense Studies*. Vol. 17, No. 3, pp. 219–27. https://doi.org/10.1080/14702436.2017.1350105

Lock, P. 1986. "Brazil: Arms for Export," pp. 79–104 in M. Brzoska and T. Ohlson, eds. *Arms Production in the Third World*. London: Taylor & Francis.

Lopes da Silva, D. 2018. "Filling Arms Production Data Gaps: South America as a Case in Point." *The Economics of Peace and Security Journal*. Vol. 13, No. 2, pp. 20–27. https://doi.org/10.15355/epsj.13.2.19

Lopes da Silva, D. 2020. "Reassessing Brazil's Arms Industry," pp. 482–505 in K. Hartley and J. Belin, eds. *The Economics of the Global Defense Industry*. New York: Routledge.

Magalhães, D. A. M. 2018. A Política Brasileira de Exportação de Armas (2003-2014). São Paulo: Cultura Acadêmica.

Maldifassi, J.A. and P. Abetti. 1994. Defense Industries in Latin American Countries: Argentina, Brasil and Chile. Westport, CT: Praeger.

[MD] Ministério da Defesa. 2012. "Livro Branco de Defesa Nacional." Brasília: Ministério da Defesa. http://www.defesa.gov.br/arquivos/2012/mes07/lbdn.pdf [accessed 16 November 2019]

Moraes, R.F. de. 2012. "Texto para Discussão no 1715 A Inserção Externa Da Indústria Brasileira de Defesa: 1975-2010." Brasilia: IPEA. http://www.ipea.gov.br/portal/images/stories/PDFs/TDs/td_1715.pdf. [accessed 16 December 2019]

Neuman, S.G. 1984. "International Stratification and Third World Military Industries." *International Organization.* Vol. 38, No. 1, pp. 167–97. https://doi.org/10.1017/S0020818300004306

Neuman, S.G. 2006. "Defense Industries and Global Dependency." *Orbis*. Vol. 50, No. 3, pp. 429–51. https://doi.org/10.1016/j.orbis.2006.04.004

[PR] Presidência da República. 2008. "Aprova a Estratégia Nacional de Defesa, e dá outras providências." Decree no 6703. Brasília: PR. http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/Decreto/D6703.html. [accessed 16 November 2019]

Sandler, T, and K. Hartley. eds. 1995. *Handbook of Defense Economics* Vol. 1. *Defense in a globalized world*. Amsterdam: Elsevier.

Smith, R. and A. Tasiran. 2010. "Random Coefficients Models of Arms Imports." *Economic Modelling* Vol. 27, No. 6, pp. 1522–1528. https://doi.org/10.1016/j.econmod.2010.07.017

14 empty airframes: public–private relations in the Swedish arms industry

Linda Åkerström

Linda Åkerström is Head of Disarmament at the Swedish Peace and Arbitration Society (SPAS/Svenska Freds), Stockholm, Sweden. She may be reached at linda.akerstrom@svenskafreds.se.

Abstract

In February 2013, the Swedish Defense Materiel Administration ordered 14 empty airframes in an effort to keep production lines open at the national arms producer Saab. This unusual example of state support is a reflection of the tight-knit relationship between state actors and the arms industry in Sweden. This article provides a case study of the political and economic factors that contributed to the order. It analyses the Swedish history of armed neutrality and military non-alignment as a driver of contemporary procurement and arms trade policies, and the formation of a "partially captive" Swedish arms market—where orders to Saab made up 60 percent of the Swedish arms procurement budget in 2018.

In April 2019, Swedish media revealed to the public that the Swedish Defense Materiel Administration (FMV) had ordered 14 extra airframes in addition to 60 new Jas Gripen E multifighter jets from Swedish arms producer Saab. The airframes were for previous versions of the fighter jet (C/D) and there was no plan to order the rest of the necessary parts. According to the FMV, the order was motivated solely by Saab's need to keep production lines open. Such state interventions in support of a national company are not regular events in Swedish state procurement, an area strictly regulated to safeguard the proper use of taxes and a free market within the European Union. This case of the empty airframes order illustrates the closeness of the state and arms industry relations in Sweden.[1]

As a self-proclaimed "humanitarian superpower", as well as a relatively large arms exporter, Sweden's arms trade policy is a combination of highly conflicting interests. In 2018, the Swedish government was the first to include a democracy criterion in its national arms trade regulation and has tried to influence the European Union to do the same. However, the Swedish government also gives extensive support to national arms production and arms trade—including arms exports to countries involved in armed conflicts and countries that have substantial democracy deficits and poor human rights records.[2]

This article provides a case study of the relationship between the state and the arms industry in Sweden, to see how it has led to such an unusual example of state support. It asks what the airframes order tells us about Swedish state–Saab relations, the mechanisms of the global arms market, and assesses the importance of Saab's economic influence on, and codependency with, the Swedish state. It considers the development of the Swedish neutrality policy, its arms trade and military procurement policy, and how Saab achieved its dominant position. Finally, the consequences of the close relationship between state and economy, and the effects of this partially captive arms market are considered.

Political background: Neutrality, independence and arms trade

The Swedish policy of "non-participation in alliances in peacetime with a view to neutrality in war" was formally adapted after the second world war and became an important marker of Swedish politics and identity for decades to come. In order to retain the ability to declare itself neutral in times of war, the official line was that Sweden had to remain outside of all political alliances and to become self-reliant on all military equipment for the armed forces—or at least credibly appear to be. This image of an impartial and independent Sweden was the justification to create a large and broad arms industry that

ISSN 1749-852X

became an integral part of Swedish "armed neutrality". It is of note that, among the countries taking a neutral path after the second world war, only Sweden made efforts to develop an autonomous arms industry. Allowing for arms exports made it possible to cover the gap between the arms industry's output and the demand from the armed forces, while allowing for economies of scale in production. In the early 2000s, the neutrality policy was gradually remolded into a declaration of military non-alignment.[3]

Swedish national regulation imposes a general ban on all arms exports from Sweden with all approved exports being exceptions to this principle. Despite this, over the period 2014–2018 Sweden was the 15th largest exporter of major conventional arms and Swedish arms sales in 2019 were five times the size of those at the beginning of the 2000s. Over time, an increasing number of buyer countries have been approved; in 1990 Sweden exported arms to 33 countries, by 2018 this had risen to 63. In 1997, exports accounted for 25 percent of Swedish arms production, compared to around 50 percent in 2018. [4]

It is questionable as to what degree having a large arms industry enabled Sweden to be independent and to what extent it can provide independence today. First, Sweden has never been fully self-sufficient in arms. Second, its arms exports have made Sweden a contributor to armed conflicts all around the world. A comparison of Swedish arms exports in the period 2000–2015 with data from the Uppsala Conflict Data Program (UCDP) showed that on average 34 percent of Swedish arms exports went to countries involved in armed conflict. In 2015, this included Algeria, India, Pakistan, Thailand, Turkey, and the United States. According to calculations by the Swedish Peace and Arbitration Society, 29 percent of the value of the Swedish arms trade in 2019 went to countries that were unfree or partly unfree (according to Freedom House's assessment of the state of political and civil rights around the world). Over the period 2014-2018, Sweden's biggest clients were Saudi Arabia, the United Arab Emirates, and Algeria, all countries criticized for serious human rights violations. Third, the internationalization of the arms industry in terms of ownership as well as the systems themselves,

The empty airframes order highlights the Swedish state-support of the domestic arms industry. Various political and economic factors have contributed to the formation of, what is now, a "partially captive" Swedish arms market. This industry support, leading to increasing arms exports, is however in clear contradiction with Sweden's ambitions in other policy areas.

has made the argument for independence increasingly difficult. One example of this is the Jas Gripen E multifighter jet, which consists of 50–60 percent international parts, mainly from Italy, Germany, the United States, France, and the United Kingdom.[5]

Nonetheless, the paradigm of Swedish armed neutrality lives on. In the annual parliamentary debate on Swedish arms exports in June 2019, representatives from the three biggest political parties (the center-left Social Democrats, the conservative Moderate Party, and the nationalist Sweden Democrats) all argued that the arms trade provided independence and military non-alliance.[6]

The Swedish defense industry and vital security interests

Of EU states, Sweden still has one of the largest military equipment procurement budgets as a proportion of defense spending, but is not among those spending the most on defense in general. It is argued that the historical focus on national arms production is an important factor in this situation; Sweden's defense industry remains relatively large compared to the size of its defense expenditure. Figure 1 shows that, of EU states reporting to the European Defence Agency (EDA) in 2016, only two states spent a larger defense budget proportion on procurement than Sweden (although many states are seen to be close behind).[7]

As orders from the Swedish armed forces diminished during the 1990s, the arms industry was fully privatized, opened to foreign ownership and to previously closed export markets. Since 2000, the Swedish state has not owned any part of the arms industry and there are no "golden shares" or other official systems for state influence. However, the traditional Swedish arms industry model focused, rather than on ownership, first and foremost on the Swedish state overseeing and

ISSN 1749-852X

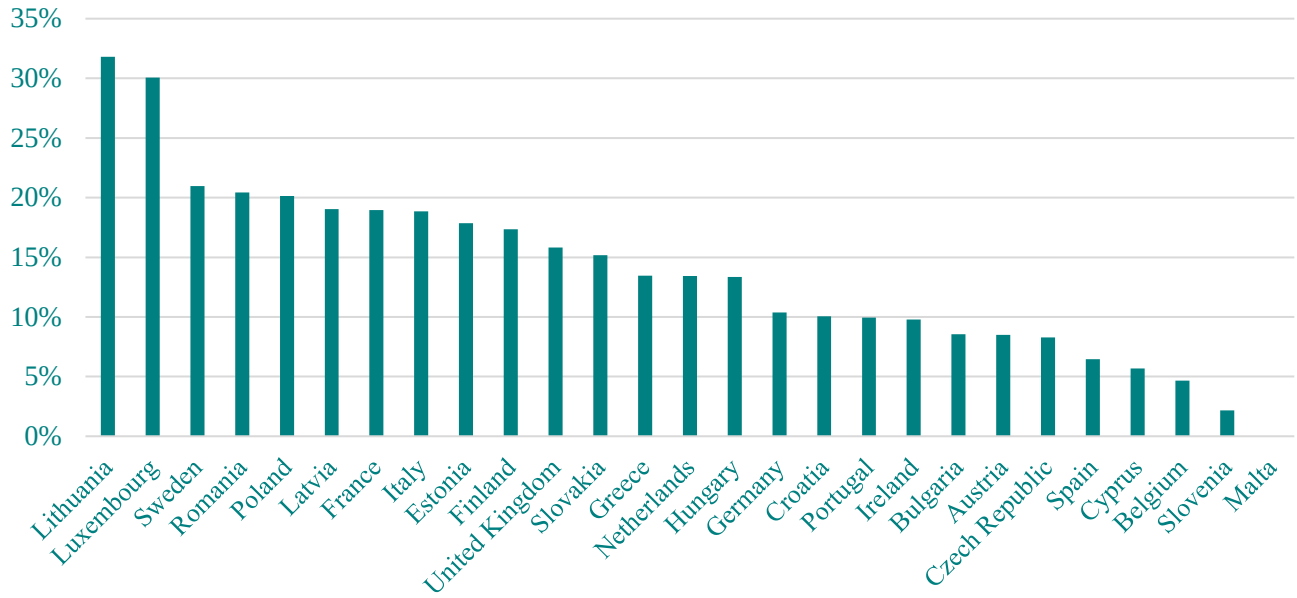


Figure 1: Procurement of military equipment as part of total defense expenditure 2016.
Source: Author's calculations based on the European Defence Agency's aggregated and national defense data (EDA, 2019).

funding research, development, production, and procurement. Even though the relationship saw changes after the cold war, joint state–industry development continued to be the norm. In 2007, a significant step away from this traditional view was taken with a new military procurement strategy. From this time, military upgrade choices were to be prioritized as, first, to upgrade and sustain, second to procure equipment already on the market and then, only if the first two alternatives were not available, to develop new equipment.[8]

However, since then, a couple of notable exceptions have been introduced to this policy. Fighter jet and underwater capabilities have been declared so important that the state ought to invest in maintaining know-how and production in Sweden. This in-country position was to be held even if cheaper (and perhaps superior) products were already available on the international market. Other areas that have been mentioned are sensors, electronic warfare, and cryptography. Classifying a capability as a "vital security interest" also makes it possible for arms producing EU states to exempt it from the EU regulation on procurement, which has competition as its main principle. This exception made the airframes order possible simply by classifying the project as providing a "vital security interest" capability.[9]

When the Jas Gripen E order was being finalized in 2012–2013, Saab had almost completed the production of version C/D to the Swedish armed forces as well as to export and leasing clients (including South Africa, the Czech Republic, Hungary, and Thailand). The order was the result of negotiations between the FMV and Saab in 2012, where alternatives were discussed on how to safeguard production and competence at Saab. The overall chain of events is described in the Parliamentary Advisory Study on Defense from 2019. The study discusses the cost of defining and supporting vital security interests and argues that the size of Swedish defense procurement is insufficient for the industry to retain its competence which, in turn, necessitates extra orders to be secured—through supplementary national orders or arms exports. According to the study, extra

ISSN 1749-852X

orders from the armed forces would result in equipment being replaced at a higher rate than necessary from a military standpoint. It can also result in an expansion of the armed forces or in orders aimed solely at maintaining industry production. The study concludes that the policy to support vital security interests could potentially amount to a "substantial financial commitment for the state".[10]

While the cost of the airframes has not been reported, it is estimated to several hundred million Swedish Krona (SEK), from a total order of SEK 37bn (USD 4bn). The connection between this order and Sweden's procurement strategy was highlighted when the Press Officer at the FMV defended the deal:[11]

> "The Gripen is a vital security interest for Sweden and it was important to keep production going and develop the ability".[12]

Saab is the only Swedish company to develop the two main "vital security interests" of fighter jets and underwater capabilities. In addition, it is a major player in sensors and electronic warfare. Saab therefore holds a special position in Swedish arms production, with no competition in many areas, and exhibits a lot of power and influence with government authorities and in the general political sphere. Saab is one of the "national champions" emerging from privatization, mergers and acquisitions in 1990s Western Europe. Today, it is the only Swedish company in SIPRI's list of the world's one hundred biggest arms exporting companies, ranking as 30th in 2018, with close to 70 percent of the total revenues of the Swedish arms industry. It is also the only Swedish-owned major domestic arms company. Arms sales represent 85 percent of its sales, with its business areas covering fighter jets, training aircrafts, ground combat weapons, missile systems, torpedoes, surveillance and C4I, submarines, and other underwater vessels.[13]

Arms markets are sometimes described as "captive" markets. Unlike a single-seller monopoly, where there is actually only one seller to choose from, in a captured market certain circumstances tie the buyer to one seller. The captured market is characterized by low competition and high barriers to entry. In Sweden's case, the circumstances that drive the partially captured arms market is the belief in national military security coupled with the idea that security depends on the upholding of national arms production. Buying from the global arms market could potentially offer lower prices and/or faster deliveries. This is, however, not possible without giving up on the idea of military independence through national arms production. Overcapacity in international arms production can create a buyer's market leaving procuring governments in a position to bargain, demanding, for example, extensive offset-deals and technology transfers in international arms deals. However, when selling to their own governments, dominant arms companies frequently have the upper hand. The fact that there are no other choices is a position that dominating arms companies can use to their advantage in negotiations with national governments.[14]

Saab's golden position

The Parliamentary Advisory Study on Defense in 2019 confirmed the monopoly power that Saab had gained. It found that the Swedish armed forces' exposure to Saab had increased during the last ten years, while Saab had in some areas become less dependent on the Swedish armed forces. In fact, determining Saab's share of procurement expenditure is not straightforward, as unlike other countries (such as the United Kingdom), there is no official data on Swedish military procurement at companies or contracts level. An estimate can be made by comparing the defense procurement budget with the information on large customers in Saab's annual reports. Figure 2 illustrates that Saab made up a substantial and generally increasing part of a relatively constant Swedish military procurement. We see an increase from 35 percent of the budget in 2009 to 65 percent in 2017 and 60 percent in 2018. By comparison, in 2018/19 the United Kingdom's privately owned BAE Systems had the largest share of the U.K. Ministry of Defence direct procurement expenditure at under 14 percent. A list of future military procurement projects in Augustsson (2019c) is dominated by Saab projects, suggesting it is unlikely that its share of the procurement budget will

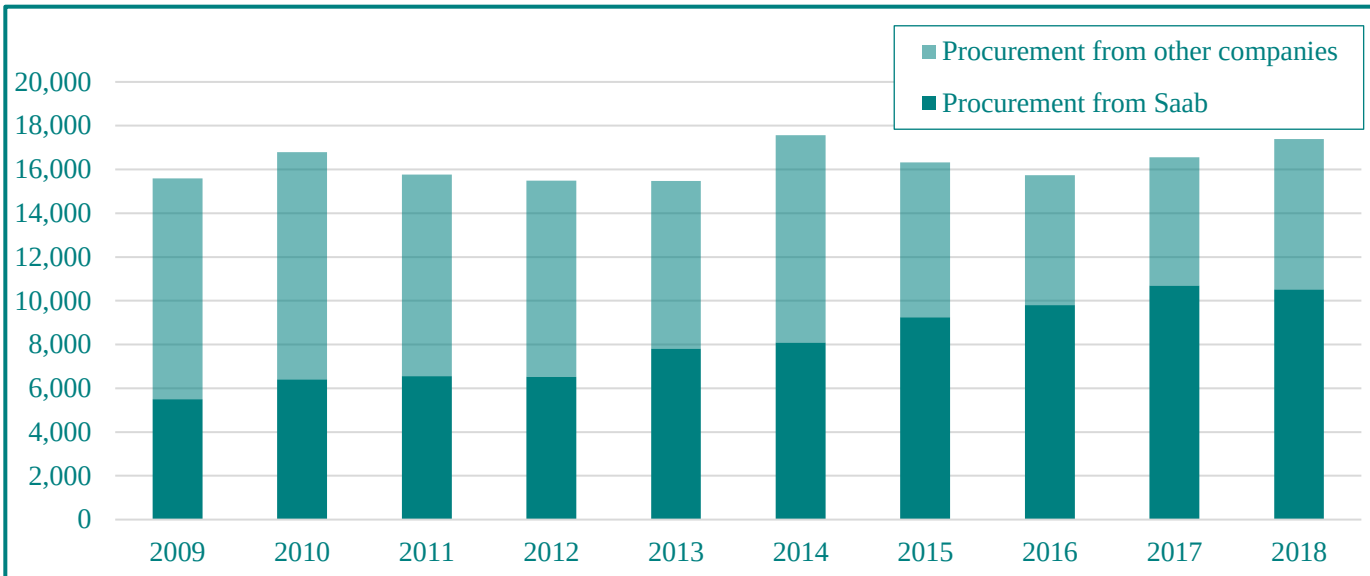


Figure 2: Procurement from Saab as part of total defense allocation for military equipment 2009–2018 (million Swedish Krona).
Sources: Saab annual reports 2009–2018. Swedish Ministry of Defense, appropriation directions for the Swedish armed forces 2009–2018.

decrease anytime soon.[15]

Saab's dominance is also evident in the armed forces' involvement in export promotion activities, such as participation in arms fairs. In 2019, 23 out of 26 approved applications for export support were for Saab activities. Due to the company's close political ties and active participation in export promotion, trade delegations, and lobby organizations, Saab has been described as a "political force". A look at the so-called "revolving door" between Saab and the political sphere, procurement, military, and PR firms focusing on defense, reveals many connections. For example, in recent years, within a year after leaving their positions, a former supreme commander of the armed forces had started working for Saab while a former minister for defense became partner of a PR firm connected to Saab.[16]

The consequences of support and dependency

Due to its competence in certain areas being defined as "vital security interests", Saab has clearly developed significant leverage in relation to the Swedish government. In this "partially captive" market, Saab's ability to make a profit, and so continue to exist as a company, has indirectly become a concern of the state. It would appear that Saab has, in part, come to be seen as a security asset rather than a private company. The environment in which the Swedish defense industry operates consists of a political paradigm of independence and military non-alliance (with its roots in the Swedish policy of armed neutrality). Political choices in procurement and arms trade are, in turn, influenced by the conditions of an oversized national arms industry acting in a global arms market with overcapacity. In this environment, a policy of state support is considered necessary to uphold national arms production—an oversized national arms industry requires state support to survive. In effect, the state support that is essential for arms exports to take place in a subsidized and crowded market becomes a factor pushing for further arms exports.

In the case of the airframes deal, the initial order created an incentive to provide even more state support to secure an export deal that would then justify the otherwise superfluous order. In the discussion that followed, having 14 airframes already produced when trying to sell Jas Gripen to other countries was framed as

ISSN 1749-852X

a competitive advantage by enabling faster deliveries. This fast-delivery competitive advantage case has been used by Saab as a sales pitch on several occasions.[17]

A disproportionate amount of power in the hands of one company, with the state as its main customer, is problematic because of the economic costs involved and the consequences for both arms exports and transparency. The Swedish procurement strategy, and the position it indirectly gives Saab, affects arms trade licensing. Safeguarding vital security interests can lead to arms export licenses being granted despite concerns about human rights, democracy, development, and the risk of armed conflict in buyer countries and regions—in clear conflict with Swedish ambitions in other policy areas.[18]

The interlinkage between arms companies and matters of national security can also hinder accountability and oversight. It is certain that the airframes order was not known to the Swedish parliament beforehand. The defense and security sector is ranked as one of the most corrupt in the world—with close relations between purchasing governments and industry actors being considered one of the built-in features that facilitate corruption. Such lack of transparency is also replicated in many importing states. Despite demands from civil society to include risk assessment for corruption in the Swedish regulation for arms trade, no such assessments are currently being undertaken. Between 2010 and 2019, 44 percent of arms exports from Sweden (in value terms) went to buyer countries with defense institutions at high, very high or critical risk of corruption.[19]

Independence from NATO is a core part of the official motivation behind Swedish arms industry support. There is, however, a contradiction between this official justification and the wider trend in Swedish defense and security policy. Although still far from NATO membership, since the end of the 1990s Sweden has moved closer to NATO through a variety of formal and informal collaborations. Besides the more officially stated motive of self-sufficiency, it is likely that national economic interests, such as keeping jobs in arms industry areas, are also drivers for industry support and arms trading. Without such other motives, there is a good case for increasing imports from the United States and other NATO countries in order to uphold Sweden's military forces.[20]

Conclusion

In the light of the close political and economic relation between the Swedish state and Saab, as well as the nature and state of the global arms market, it becomes unsurprising that an order could be made for extra military equipment connected to the Jas Gripen program. This kind of support resulted from several political and economic factors at play, and so provides an example of the costs of maintaining national arms production.

The Swedish state-arms industry relationship has been a subject of recent debate in Sweden, with a new military procurement strategy to be developed in 2020 to replace that of 2007. A new strategy could potentially result in increased formal state control of the industry, but it seems unlikely that government support will diminish. An oversight of the vital security interests has been suggested as part of this strategy and, given the apparent advantages of having a company product defined as a "vital security interest", it is perhaps not surprising that there has been a push for more capabilities to be included in this definition.[21]

In 2016, when asked to describe the relationship between the Swedish state and Saab, the official in charge of state support to the arms industry at the FMV said that it was "like a parent caring for its child". The official went on to say that the FMV cares for and creates an independent individual that, with support, can stand on its own and interact with others—rather than constantly having to be fed orders from the Swedish armed forces like before. The analysis in this article suggests that the Swedish government's relationship to Saab is more that of a parent caring for a fully grown adult, still living at home in order to sustain a lifestyle they could never afford on their own, with the parents convinced that they are the dependent parties in the arrangement.[22]

In the debate on Swedish arms industry and arms trade, the focus on Saab's role in national defense

ISSN 1749-852X

capability often overshadows the fact that Saab is a fully private and profit-making company—albeit one with a golden position that blurs the line between private and public. This substantially impedes efforts for more restrictive arms trade assessments, despite public concern regarding the gap between the Swedish peaceful image and its arms trade practice.[23]

Notes

1. Media reports and order: Augustsson (2019a). Motivation: Augustsson (2019a); FMV (2020c). Procurement: Upphandlingsmyndigheten (2020).

2. Humanitarian superpower: Swedish government (2013, p. 10). Influencing the EU: Lindell (2020).

3. Neutrality policy: Goldman (1991, p. 123). Identity: Stenlås (2010, pp. 8–9). Self-sufficiency: Karlsson (2015, pp. 13–15, 68); Davis (2002, p. 186). Credibility: Goldman (1991, pp. 123–124). Impartiality: Stenlås (2010, pp. 62–63, 84.); Hagelin (1990, p. 37). Solution: Karlsson (2015, p. 14). Remolding: Tepe (2007).

4. Ban: Swedish government (2017/2018:23, pp. 25, 29–30). While not specifically written into the Military Equipment Act or the Military Equipment Regulation, the general ban is clearly stated in the government bill presenting the most recent changes to the regulation, confirming a stance taken in previous government bills that all approved licenses are to be seen as exceptions to the general ban. 15th largest exporter: SIPRI (2019). Increase: Svenska Freds (2019). Buyer countries: More products have been put on the control list; this probably also has an effect on this increase. Comparison: Åkerström (2018, p. 29); Swedish government (2019, p. 5). Export percentage: 1997: KEX (2015a, p. 199); 2018: Swedish government (2019, p. 79).

5. Self-sufficiency: Hagelin (1990, p. 38). Armed conflicts: Hagelin (1990, p. 51); Åkerström (2018, pp. 21; 136–138). Armed conflict: Delling and Kudo (2016). See also: Åkerström (2018, p. 135). Calculations on unfree and partly unfree: Svenska Freds (2019) using data from Freedom House (2020). Buyer countries: Wezeman *et al.* (2019, p. 2). Critique: e.g., Human Rights Watch (2020, pp. 487, 586, 22). Internationalization: Olsson (2019, p. 8). Jas Gripen E: FMV (2020a).

6. Swedish parliament (2019, pp. 60–61, 70).

7. Procurement: James and Teichler (2014, p. 133). Ranking: Olsson (2019, p. 8). Comparative share: Author's calculations based on EDA (2019). Figure 1 source: EDA (2019)

8. Privatization: Bérau-Sudreau (2017, p. 27). State ownership: The government agency in charge of export controls can demand that board members are Swedish citizens and residents. Government approval is needed to sell an arms company to a foreign buyer. Oversight: Larsson (2019, p. 141). Joint development: Larsson (2019, p. 148–149). Strategy: Försvarsmakten (2007).

9. Exceptions: Försvarsberedningen (2019, p. 266). The term "capabilities" is broad and can include more than just the system itself. Regulation: EU (2009).

10. Negotiations: FMV (2020c). Orders: Försvarsberedningen (2019, p. 258); Costs: Försvarsberedningen (2019, p. 263). Consequences: Försvarsberedningen (2019, p. 267).

11. Cost: Augustsson (2019a).

12. Augustsson (2019a). Author's translation.

13. Champions: Bitzinger (2009, p. 182). List: Fleurant *et al.* (2019, p. 9); Industry percent: Swedish government (2019, p. 39). Sweden's second and third biggest arms companies, Bofors and Hägglunds, are both owned by British BAE Systems. Percent: Fleurant *et al.* (2019, p. 9); International sales: Saab (2019, p. 3).

14. Captive market: e.g., Bitzinger (2009, p. 189). Definition: One example of a captured market is buying food and water in an airport. Even if there would, in general, be no shortage of places to buy food and water—once inside the terminal the choices can be very limited (Business Dictionary, 2019). Buyer's market: see for example Bitzinger (2014, p. 208); Tan (2014, p. 24). Trade deals: Bitzinger (2009, p. 189).

15. Study: Försvarsberedningen (2019, p. 267). Figure 2 sources: Saab (2020); Ekonomistyrningsverket (2020). BAE share: United Kingdom government (2019). List: Augustsson (2019c).

16. Applications: FMV (2020b). Political force: Larsson (2019, p. 150). Revolving door: Svenska Freds (2010); Former Supreme commander Sverker Göransson started working for Saab's U.S. branch: TT (2016); former Minister of Defense Sten Tolgfors became partner of a PR firm with Saab as one of its clients: Röstlund and Lagercrantz (2013).

17. Augustsson (2019a).

ISSN 1749-852X

18. Evertsson (2020).

19. Parliament: Augustsson (2019b). Rank and relations: TI (2010, p. 2); Feinstein *et al.* (2011). Demand: Svenska Freds *et al.* (2014). Percent: Author's calculations, based on TI (2015) and Swedish government (2010–2019). The index measures "the existence, effectiveness and enforcement of institutional and informal controls to manage the risk of corruption in defense and security institutions", TI (2015).

20. Petersson (2018).

21. Försvarsberedningen (2019, p. 266–269).

22. Åkerström (2018, p. 199). Author's translation.

23. 70 percent of Swedes are for example against Swedish arms exports to warring parties in the Yemen war, see Swedish Redcross (2019).

References

Åkerström, L. 2018. *Den svenska vapenexporten*. Stockholm, Sweden: Leopard.

Augustsson, T. 2019a. "Staten betalade Saab för 14 gripenskrov - är oanvända." *Svenska Dagbladet* [Stockholm]. 15 April 2019. https://www.svd.se/staten-betalade-saab-for-14-gripenskrov--star-oanvanda [accessed 13 May 2019].

Augustsson, T. 2019b. "Riksdagen informerades aldrig om Gripenaffär." *Svenska Dagbladet* [Stockholm]. 14 April 2019. https://www.svd.se/riksdagen-informerades-aldrig-om-gripen-affar [accessed 18 February 2020].

Augustsson, T. 2019c. "Försvarets lista: här är miljardaffärerna." *Svenska Dagbladet* [Stockholm]. 30 August 2019. https://www.svd.se/forsvarets-lista-har-ar-tankta-miljardaffarerna#sida-6 [accessed 16 October 2019].

Bérau-Sudreau, L. 2017. "Support or Control? The Politics of Arms Sales in France and Sweden (1990–2015)." Doctoral Thesis. Paris, France: Université Paris II- Panthéon-Assas.

Bitzinger, R.A. 2009. "The European Defense Industry in the 21st Century: Challenges and Responses," pp. 175–195 in Bitzinger, R. A., ed. *The Modern Defense Industry: Political, Economic and Technological Issues*. Santa Barbara, CA: Praeger Security International.

Bitzinger, R.A. 2014. "Globalization Revisited. Internationalizing Armaments Production," pp. 208–220 in Tan, A.T.H., ed. *The Global Arms Trade: A Handbook.* New York, NY: Routledge. https://doi.org/10.4324/9780203851456-15

Business Dictionary. 2019. "Captive Market." http://www.businessdictionary.com/definition/captive-market.html [accessed 25 October 2019].

Davis, I. 2002. *The Regulation of Arms and Dual-Use Exports*. Germany, Sweden and the U.K. New York, NY: Oxford University Press.

Delling, H. and P. Kudo. "Skarp kritik mot Löfvens resa :och hans sällskap." *Svenska Dagbladet* [Stockholm]. 20 October 2016. https://www.svd.se/lofven-pa-omstridd-resa-till-saudiarabien [accessed 29 January 2020].

[EDA] European Defence Agency. 2019. "Aggregated and National Defence Data From 2005–2017." https://data.europa.eu/euodp/en/data/dataset/defence-data-2016-2017 [accessed 27 March 2020].

Ekonomistyrningsverket. 2020. "Regleringsbrev." https://www.esv.se/statsliggaren/regleringsbrev/?RBID=20742 [accessed 6 April 2020].

[EU] European Union. 2009. "Directive 2009/81/EC Of the European Parliament and of The Council on the Coordination of Procedures for the Award of Certain Works Contracts, Supply Contracts and Service Contracts by Contracting Authorities or Entities in the Fields of Defense and Security, and Amending Directives 2004/17/EC and 2004/18/EC." Official Journal of the European Union, 216, p. 76. 20 August 2009. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0081 [accessed 27 March 2020].

Evertsson, K. 2020. "Väsentliga säkerhetsintressen." Inspectorate of Strategic Products. E-mail to the author. 17 February 2020.

Feinstein, A., P. Holden, and B. Pace. (2011). "Corruption in the Arms Trade: Sins of Commission." *SIPRI Yearbook 2011. Armaments, Disarmament and International Security.* Oxford: Oxford University Press.

Fleurant, A., A. Kuimova, D.L. Da Silva, N. Tian, P.D. Wezeman and S.T. Wezeman. 2019. "The SIPRI Top 100 Arms-Producing and Military Services Companies, 2018." SIPRI Fact Sheet, December 2019.

[FMV] Försvarets materielverk. 2020a. "Fråga: Delar i Jas Gripen." E-mail to the author. 14 February 2020.

[FMV] Försvarets materielverk. 2020b. "Fråga om exportstöd." E-mail to the author. 18 February 2020.

[FMV] Försvarets materielverk. 2020c. "Fråga om extra

gripenskrov." E-mail to the author. 20 February 2020.
Försvarsberedningen. 2019. "Värnkraft - Inriktningen av säkerhetspolitiken och utformningen av det militära försvaret 2021–2025." Ds 2019:8. Stockholm, Sweden: Ministry of Defense.
Försvarsmakten. 2007. "Strategi för Försvarsmaktens materielförsörjning." Annex 23 383:61994. Stockholm, Sweden: Försvarsdepartementet.
Freedom House. 2020. "Countries and Territories." https://freedomhouse.org/countries/freedom-world/scores [accessed 7 April 2020].
Goldman, K. 1991. "The Swedish Model of Security Policy." *West European Politics*. Vol. 14, No. 3, pp. 122–132. https://doi.org/10.1080/01402389108424862
Hagelin, B. 1990. *Neutrality and Foreign Military Sales. Military Production and Sales Restrictions in Austria, Finland, Sweden, and Switzerland*. Boulder, CO: Westview Press.
Human Rights Watch. 2020. *World Report 2020*. NY: Human Rights Watch.
James, A.D. and T. Teichler. 2014. "Post-Cold War Defense Procurement in Europe," pp. 133–150 in A.T.H. Tan, ed. *The Global Arms Trade: A Handbook.* New York: Routledge. https://doi.org/10.4324/9780203851456-10
Karlsson, B. 2015. *Svensk försvarsindustri 1945–1992*. Falkenberg, Sweden: Forskningsprojektet Försvaret och det kalla kriget.
[KEX] Krigsmaterielexportöversynskommittén. 2015a. "Skärpt exportkontroll av krigsmateriel - del 1." SOU 2015:72. Stockholm, Sweden: Review Committee for Exports of Military Equipment.
Larsson, S. 2019. "In The Name Of Society. The Branding of Swedish Civil Security Technologies And Their Exclusionary Effects." Doctoral Thesis. King's College. London, U.K.: King's College.
Lindell, U. 2020. "Fråga om demokratikriteriet och översynen av EU:s gemensamma ståndpunkt." Swedish Ministry for Foreign Affairs. E-mail to the author. 5 February 2020.
Olsson, P. 2019. "Pang för pengarna – en ESO-rapport om Sveriges militära materielförsörjning." ESO report 2019:7. Stockholm, Sweden: ESO.
Petersson, M. 2018. "'The Allied Partner': Sweden and NATO Through the Realist–Idealist Lens." pp. 73–96 in Cottey, A. ed. *The European Neutrals and NATO: Non-alignment, Partnership, Membership?* London: Palgrave Macmillan. https://doi.org/10.1057/978-1-137-59524-9_4
Röstlund, L. and L. Lagercrantz. 2013. "Nya jobbet: sälja vapen." *Aftonbladet*. 14 March 2013. https://www.aftonbladet.se/nyheter/a/3jRgGX/nya-jobbet-salja-vapen [accessed 16 October 2019].
Saab. 2019. "Partnerships for Greater Security. Annual And Sustainability Report 2018." https://saabgroup.com/globalassets/corporate/investor-relations/presentations/saab_annual_report_2018.pdf [accessed 21 October 2019].
Saab. 2020. "Financial Reports and Presentations." https://saabgroup.com/investor-relations/reports/ [accessed 6 April 2020].
[SIPRI] Stockholm International Peace Research Institute. 2019. Arms Transfers Database. *TIV of arms exports from the top 50 largest exporters, 2014–2018*. Generated: 2019 May 7.
Stenlås, N. 2010. "Military Technology, National Identity and the State. The Rise and Decline of a Small State's Military Industrial Complex," pp. 61–84 in Lundin, P., N. Stenlås and J. Gribbe, eds. 2010. *Science for Welfare and Warfare: Technology and State Initiative in Cold War Sweden*. Sagamore Beach, MA: Science History Publications.
[Svenska Freds] Svenska Freds- och Skiljedomsföreningen, Internationella Kvinnoförbundet för Fred och Frihet, Amnesty International Sweden, Kristna Fredsrörelsen, Diakonia and Transparency International Sweden. 2014. "Centrala villkor för ett strikt, tydligt och transparent regelverk för krigsmateriel." https://fredfrihetfeminism.files.wordpress.com/2015/02/punkter-till-mc3b6te-med-kex-30-jan.pdf [accessed 25 October 2019].
[Svenska Freds] Svenska Freds- och Skiljedomsföreningen. 2010. "Så snurrar vapenkarusellen: En rapport om det svenska militärindustriella komplexet och tio av dess mäktigaste aktörer." Svenska Freds report. Stockholm: Svenska Freds. https://www.svenskafreds.se/app/uploads/2018/08/vapenkarusellen-rapport2010.pdf [accessed 18 October 2019]
[Svenska Freds] Svenska Freds- och Skiljedomsföreningen. 2019. "Snabba fakta om vapenexporten." https://www.svenskafreds.se/vad-vi-gor/vapenexport/snabba-fakta-om-vapenexport/ [accessed 1 April 2020].

ISSN 1749-852X

Swedish government. 2010–2019. "Strategisk exportkontroll - krigsmateriel och produkter med dubbla användningsområden." 2009-2018. https://www.regeringen.se/sokresultat/?query=%22strategisk%20exportkontroll%22&ct=Skrivelse [accessed 6 April 2020].

Swedish government. 2013. "Regeringens deklaration vid 2013-års utrikespolitiska debatt i riksdagen onsdagen den 13 februari 2013." https://www.regeringen.se/informationsmaterial/2013/02/utrikesdeklarationen-2013/ [accessed 11 February 2020].

Swedish government. 2017/18. "Skärpt exportkontroll av krigsmateriel." Government bill 2017/2018:23. https://data.riksdagen.se/fil/CA577D47-DBFB-4D53-AC6F-C99829198FED [accessed 3 February 2019].

Swedish government. 2019. "Strategisk exportkontroll - krigsmateriel och produkter med dubbla användningsområden." Skr: 2018/2019:114. https://riksdagen.se/sv/dokument-lagar/dokument/skrivelse/strategisk-exportkontroll-2018---krigsmateriel_H603114 [accessed 11 February 2020].

Swedish parliament. 2019. "Riksdagens protokoll 2018/19:103." 12 June 2019. https://data.riksdagen.se/fil/1F06D209-3FF3-4858-BAF2-E7B7BBC4216D [accessed 11 February 2020].

Swedish Redcross. 2019. "7 av 10 vill stoppa vapenexporten till kriget i Jemen." https://press.raddabarnen.se/pressreleases/7-av-10-vill-stoppa-vapenexporten-till-kriget-i-jemen-2932322 [accessed 31 March 2020].

Tan, A.T.H. 2014. "Defence Spending and Procurement Trends in South-East Asia," pp. 151–165 in A.T.H. Tan, ed. *The Global Arms Trade: A Handbook.* New York, NY: Routledge. https://doi.org/10.4324/9780203851456-2

Tepe, F.F. 2007. "Swedish Neutrality and its Abandonment." *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi, Bahar*. Vol. 6, No. 13, pp. 183–201.

[TI] Transparency International. 2010. "Defence Offsets: Addressing the Risks of Corruption & Raising Transparency." http://ti-defence.org/wp-content/uploads/2016/03/1004_corruption_risk_offsets.pdf [accessed 13 February 2020].

[TI] Transparency International. 2015. "Government Defense Anti-Corruption Index." https://government.defenceindex.org [accessed 19 September 2019].

[TT] Tidningarnas Telegrambyrå. 2016. "Förre ÖB börjar jobba för Saab." *Sveriges Television*. 16 February 2016. https://www.svt.se/nyheter/inrikes/forre-ob-borjar-jobba-for-saab [accessed 19 October 2019].

United Kingdom government. 2019. "Open Data Source Tables Relating to Finance and Economics Annual Statistical Bulletin: Trade Industry and Contracts 2019 (revised 15 January 2020)." table 5a. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/858059/Trade_Industry_and_Contracts_2019_Supporting_Tables_Revised_15th_Jan_2020.ods [accessed 28 January 2020].

Upphandlingsmyndigheten. 2020. "Om regler för upphandling." https://www.upphandlingsmyndigheten.se/upphandla/om-upphandlingsreglerna/ [accessed 14 February 2020].

Wezeman, P. D., A. Fleurant, A. Kuimova, N. Tian, and S.T. Wezeman. 2019. "Trends in International Arms Transfers 2018." SIPRI Fact Sheet, March 2019.

ISSN 1749-852X

The weaponized Gulf *riyal politik(s)* and shifting dynamics of the global arms trade

Emma Soubrier

Emma Soubrier is an Associate Researcher at the Centre Michel de l'Hospital, Université Clermont Auvergne (UCA), Clermont-Ferrand, France and a Visiting Scholar at the Arab Gulf States Institute (AGSIW), Washington, D.C., U.S. She may be reached at esoubrier@hotmail.fr.

Abstract

This article considers the politics and economics of arms trade in the Persian Gulf from the perspective of the importers, rather than the usual focus on the exporters. It analyses the purposes that weapons purchases have served over the last three decades for three of the most important Middle Eastern arms importers—the Kingdom of Saudi Arabia, the United Arab Emirates, and Qatar. This shows an increasingly blurred divide between the political, economic and strategic dimensions of the arms trade. It suggests an important shift in the relations between the arms client/importing states, supplier/exporting states, and defense industrial companies.

Analyzing the arms trade in the Middle East is a key task for researchers, given its increasing importance to the global market. With an increasing share of imports of major arms systems, it is the second most important region for arms imports—Asia and Oceania are first, but the gap is rapidly closing. Comparing the period 2010–2014 with 2015–2019, Asia and Oceania's average global share of international arms transfers decreased from 46% to 41%, while the Middle East's share increased from 23% to 35%. Within the Middle East, the Arabian peninsula is home to three of the five most important arms importers—the Kingdom of Saudi Arabia, the United Arab Emirates and Qatar.[1]

Most of the Middle Eastern and Gulf case studies have tended to focus on the trends and implications of arms deals from the perspective of the exporters. In particular, they have looked at the use of arms exports as a tool of foreign policy and statecraft, and have also explored different types of power and influence patron states have in their relationships with client states. Exceptions to this include military spending demand studies on Egypt, authoritarian regimes in general, and developing countries.[2]

Analyzing the arms trade in the Gulf region provides a useful way of considering the major shifts in standing and influence between stakeholders within the triangle of links between arms client states, supplying states, and the defense industrial companies. The next section gives an overview of some of the main characteristics of the politics and economics of arms procurement in the Gulf. The article then connects these to the broader patterns of the global arms trade, where it is becoming increasingly difficult to distinguish between the political, economic, and strategic dimensions of the trade. Finally, it considers the implications for the power dynamics among the stakeholders. One clear development is the increasing bargaining power of the Gulf clients in the relationships with their Western suppliers and partners.

Arms trade in the Arabian peninsula: A political weapon

The Persian Gulf has attracted a significant portion of the global arms exports for a long time, and the three monarchies of the Arabian peninsula under focus here were already in the world's top 5 for military spending per capita in the early 1980s. This does not come as a surprise, given that the region is situated at a strategic node between Asia, Africa and Europe, home to crucial international reserves of oil and gas, and has a high potential for conflicts associated with the internal dynamics of the Gulf regional security complex. Moreover, Saudi Arabia, Qatar and the United Arab

ISSN 1749-852X

Emirates are some of the richest countries in the world in terms of GDP per capita. Their armed forces represent a notable proportion of their citizens—as national-minority states, their total population is largely composed of non-citizens. They also have little to no indigenous defense industrial capability, although they are working on developing this. These three countries thus provide clear examples of the way in which the decision to import arms reflects threats, ability to pay, the labor intensity of force structure, and domestic weapons production capability.[3]

For these Gulf Arab states, however, defense procurement has always been about much more than acquiring the means to directly address security threats. Lucrative arms deals have been a means of securing continued interest, support, and protection from external partners. An important driver of arms procurement for Gulf leaders has been to keep their Western security guarantors close, by investing massively in their industrial military complexes and helping sustain them through these contracts. Of course, Western powers, in particular the United States, the United Kingdom and France, have long been involved in Gulf security for numerous reasons linked to their own national security and strategic interests—not least the importance of securing and maintaining the flow and their access to oil. It has been demonstrated that oil dependent economies have an incentive to transfer arms to oil rich countries (even in the absence of a direct bilateral oil-for-weapons exchange) to reduce their risk of instability and consequent disruption to oil supplies.[4]

While it is true that arms trade is an effective foreign policy tool for oil dependent countries, the relationship between suppliers and recipients has more of a quid pro quo dynamic—part of a broader, tacit and mutually beneficial oil-for-security pact. Purchases of advanced weapons have also been used as a foreign policy tool by the Gulf regimes to make sure that the world powers remained concerned about their security and stability. Additionally, studies generally posit that the acquisition of new equipment improves the defense capabilities of recipients. However, for a long time the purchase of advanced military systems by Saudi Arabia, the United Arab Emirates, and Qatar did not lead to any increase in their fighting capacity. This was dramatically illustrated by their lack of preparedness in the face of the invasion of Kuwait by the troops of Saddam Hussein in the early 1990s. Rather, the security of Gulf states was improved through arms transfers thanks to the protection guarantees they secured from Western powers.[5]

Defense procurement in the Gulf has always been about much more than acquiring the means to directly address security threats. Building on the shifting dynamics of the global arms trade, the countries of the Arabian peninsula are increasingly utilizing it as a tool of reverse influence on their traditional suppliers and partners. This newfound leverage does not only affect what these exporters are willing to sell them, but may also affect the foreign policy they are willing to implement in the region.

Another political aspect of arms procurement that is seldom considered is the internal security and stability provided both directly and indirectly. Purchasing an impressive set of jetfighters, armored vehicles or missiles can be used to promote national unity and encourage the population to stand behind their leaders—both by stirring a sense of national pride and by instigating existential fear toward a real or hypothetical enemy. It might also represent an unspoken threat of repression to encourage the population to behave.[6]

Last, but not least, arms procurement has increasingly become part of the distributive dynamic within the rentier states of the Gulf. As the basic hypothesis of the rentier state paradigm implies, natural resource rents create specific power dynamics and provide leaders with high co-optative capacity and associated weak political opposition. Not only does the absence of fiscal taxes lead to the establishment of a rentier social pact, allowing leaders to keep their population away from decision making processes, but it can create groups of people who are not keen on reforms as long as they benefit from the rents. The diffusion of modern arms has long been used by outside patrons to affect dominance patterns within countries—reinforcing the internal security position of state-centric elites while weakening the position of other groups that could benefit from alternative definitions of security and development. Military purchases have increasingly been used by the clients themselves, with

ISSN 1749-852X

Gulf leaders, especially in the United Arab Emirates, utilizing the arms trade as a new vessel of such internal bargains.[7]

As part of their offsets strategy, the United Arab Emirates led the way in terms of requiring international defense companies to operate through joint ventures, with a local partner as a 51% shareholder. Such joint ventures reflect the core rentier distributive designs of the United Arab Emirates and other countries of the Arabian peninsula, as many of them employ very few locals, and end up being little more than a way for the majority shareholders to benefit simply by being Gulf citizens. Of course, this might change over time, as a real effort has been put on training and on nationalization (Emiratization, Saudization, etc.) of the workforce in the private sector of all these Gulf countries. It is, however, very likely that the arms trade will also remain a means of achieving political and economic interests—facilitated, for both importers and exporters, by the lack of transparency in the trade.[8]

Politics, economics, and strategy: The increasing blurred lines of the global arms trade

For manufacturing countries, arms sales have historically relied on both economic and political motives. In fact, the capacity to determine the economic drivers of the arms trade is limited because this sort of trade is predominantly determined by political, military or other non-economic factors. The economic literature on arms trade has, therefore, developed to incorporate these elements. Levine and Smith provide an influential dynamic model to analyze the strategic interactions between arms exporters and importers, market structures, and national and international regulatory regimes.[9]

Economists have closely associated exports with issues such as employment and the amortization of research and development costs. The number of jobs associated with any given arms deal, in progress or already signed, is indeed often one of the first arguments brought forward by the media and intended to influence public opinion. The salience of the arms sales issue in public opinion, and the way it is framed in national media, has been shown to have had a major influence on the degree of arms export regulation in Europe. Studies have shown, however, that there tends to be a negative causality relationship between military expenditure and growth, pointing in particular to negative externalities of military expenditure on the civilian sector.[10]

As for political motives, these have traditionally included alliance building as well as political leverage or influence—with the cold war's end seeing arms supplies remaining an important policy instrument for the United States globally and many other suppliers regionally. The interconnections between the political and economic dimensions of arms trade would now seem to have increased to such a point that they are hard to distinguish from one another. This results from the intensification of the role of the private sector in the global arms trade, against the background of what has been identified as a shift toward the arms bazaar approach and away from bilateral national negotiations and dealings. There has been an increase in the number of military equipment exhibitions, notably in the Gulf countries (particularly the United Arab Emirates). The International Defense Exhibition and Conference (IDEX) has taken place in the United Arab Emirates since 1993, and the Doha International Maritime Defense Exhibition and Conference (DIMDEX) has been held in Qatar since 2008. While these exhibitions have helped smaller companies and brokers by boosting their visibility, it may also have enabled the major players to further secure their export markets.[11]

Another important factor has been the increasing importance of offsets for arms deals. As already argued, exports of military technology in the 1980s did indeed help boost the role of the arms producers—making them participants in the cycles of negotiations leading up to arms deals. The growth of offsets, both military and civil, has further strengthened their position.[12]

Finally, the dependence of the defense technological and industrial base of arms producing countries on exports has increased tremendously. Any country with a relatively small domestic arms market is inclined to promote exports to reduce unit costs through economies of scale. Today one can witness a surge in the amount of

political support that arms exports receive—displaying almost an "existential need" to export. This is true for traditional arms producers and for the newer arms producers emerging as a result of offsets. State-based arms industries kept alive by an infusion of costly state aid often turn out to be too weak to survive in the global arms market—they "become infant industries that never grow up and drain the economies of the mother state". It is also argued that, while the very survival of defense companies is increasingly linked to finance capital and to globalization, the companies themselves have not globalized (in the sense of becoming transnational and losing their home base). They require the support of their national governments both as continued customers and in promoting them on the export front.[13]

These developments can be explained by two trends. The first was the shrinking of Western defense budgets which occurred in the aftermath of the end of the cold war in the early 1990s, and the contraction of defense budgets (particularly in Europe) in the aftershock of the global financial crisis in the late 2000s. These encouraged arms companies to eagerly turn to export markets. The second is the growing export race within the international arena, with the emergence of new (or increasingly active) competing arms producers, in particular Russia, China and Brazil, and, to a lesser extent, South Korea, Israel, and Ukraine.

Shifting relations within the client state, supplying state, and industrial companies triangle

The political value of arms trade in the three Gulf monarchies used to be such that companies, through their governments, could virtually sell anything they wanted (leveraging their clients' lack of knowledge for advantage and profit). This might, of course, be seen as a sign of indifference rather than ignorance, given that the purchases met the buyers' foreign policy missions. More recently, changes have been taking place. These countries have developed their armed forces, investing more effort in training and modernizing equipment, and have increasingly projected their militaries onto foreign theaters of operation. As a result, their procurement has become more mission-oriented and coherent, with identified capability needs. In addition, they have increasingly looked to develop their own defense technological, and industrial base. This is seen as a means to reduce their security dependence on their traditional Western partners and to reduce their economic dependence on oil as their main source of wealth.[14]

These changes are to be expected, given the argument that states wanting to minimize their arms dependence generally have two alternatives. The first is to increase self-sufficiency in arms production. This is difficult even for the most advanced economies, and any self-produced arms still need to be complemented by imported weapons or components. The second alternative is to enhance the state's autonomy by diversifying its supplier portfolio. This is particularly apparent for Saudi Arabia, since the beginning of Mohammed bin Salman's ascendency to power, and the United Arab Emirates.[15]

These changes do not mean that arms trade in the Gulf has lost its (geo)political dimension. Quite the opposite, the leadership in these three monarchies of the Arabian peninsula are well aware of the magnet they represent for defense manufacturers and governments, and are keen to use the export race to their advantage.

As argued elsewhere, the turmoil which the region has gone through since the beginning of the Arab Spring became an enabler for assertive and competing Gulf power plays. The power vacuum led the United Arab Emirates, Qatar and Saudi Arabia to conduct more vigorous policies to defend their security and stability, and also to enforce their views as to the direction in which the region ought to be heading. They did this using military force in some places (Bahrain, Libya, Syria, and Yemen) but mostly using their economic muscle through what can be termed a proactive "*riyal politik*" (economic diplomacy using riyals). Similarly, their considerable wealth, at a time when many countries were struggling economically, has allowed them substantial outreach in the rest of the world. Thus, the arms trade in the Gulf might be seen as a weaponization of the regional actors' ever more assertive riyal politik.[16]

One consequence is that the specificities of products no longer matter less than other unspoken criteria

ISSN 1749-852X

(namely the political support and security guarantees these arms purchases allowed them to buy), but also the under the table capital transactions they were often associated with. Industrial companies are unanimous in the belief that it has become more difficult to please these demanding client states.[17]

It is also possible that there is a shift or perhaps even a reversal in the relations between the client states and supplying states (along the lines of the phenomenon of "reverse influence"). Two caveats are important to note. First, it is often difficult to establish, with certainty, who exerts influence on whom when there is such a convergence of multifaceted interests between the actors. This is apparent in the literature on patron-client relations. The second caveat is that some forms of influence are so subtle that, while it is crucial to point out their existence, they are particularly tricky to trace. Further to this, arms and military technology may reflect "dependent militarization", where the "accumulation dynamic is a reflection of external forces rather than self-sustaining". As such, the link between the identity of a country's supplier and its foreign policy preferences may not be obvious.[18]

Still, it is reasonable to consider the Arab monarchies of the Persian Gulf as effectively nurturing a newfound strategic leverage onto all the states that are competing to export arms to them. This leverage seems to not only affect what a given producing country is willing to sell to its Gulf partners, but possibly the foreign policy it is willing to implement in the region as well. Gulf leaders might have the ambition to use their growing relative advantage over external partners not only to bolster their power and assertiveness, but also to deprive the external partners of their capability to hinder or interfere with their foreign policies. For example, the alignment of French policy choices with Gulf countries, especially the United Arab Emirates in Libya, might be linked to a surge in French regional arms exports, including to Egypt, a close ally and client of Abu Dhabi. The limited response of the United States, the United Kingdom, and France to the Yemen war, plus the lack of a strong condemnation after the killing of the journalist Jamal Khashoggi might also be seen as illustrations of a will to prioritize business as usual.[19]

Of course, it is possible to argue that the growing leverage that Gulf countries have on their arms suppliers has in fact a lot to do with the oil dependence of the latter's home states. Gulf defense spending has, however, continued increasing even as oil prices dropped over the last decade. It might be that these two aspects of international relations are so closely intermingled in the Gulf, that it is difficult to establish which prevails. More empirical data might be needed to sort one from the other.[20]

Conclusion

Ultimately, the argument of this article is not to deny the economic and strategic interests that the arms trade with Arabian peninsula countries represents for major exporters—particularly the United States, the United Kingdom, and France (which remain the Gulf States' main suppliers). Nor is it to dispense with the increasing importance of arms purchases in the implementation of autonomous security and defense strategies on the part of the Gulf states. Rather, it aims at raising awareness that the military contracts signed with the Gulf Arab states also continue to play a crucial role in broader (geo)politics and multifaceted power dynamics—especially so for Saudi Arabia, the United Arab Emirates and Qatar. These dynamics are primarily between stakeholders within these states and between arms suppliers and clients, but also occur between political and economic actors within the exporting countries. A factor playing a key role in these multiple power shifts is the increasing leeway and authority of defense industrial companies in the global arms trade and a possible consequent increase in their political sway with their host governments. While this issue has only been touched upon in this piece, it is a promising avenue for future research, especially as it can be tied into wider considerations on the intensification of the role of the private sector amidst a financialized world. This case study of the Gulf States is certainly useful in showing how the traditional rules of the game and the political, economic, and strategic interests of all state and non-state actors has been changing.

ISSN 1749-852X
https://www.EPSJournal.org.uk

Notes

1. Share: SIPRI (2020). It is worth pointing out that while Egypt, which was the second most important arms importer in the Middle East over the period 2015–2019, does not belong to the Arabian peninsula. Most of its arms purchases were rendered possible by the financial aid provided by the Gulf Arab states, which confirms the importance of understanding the rationales of arms trade in this specific region.

2. Tool: Pierre (1982). Types of power and influence: Krause (1991). Demand: Abdelfattah *et al.* (2014); Bove and Brauner (2016); Dunne and Perlo-Freeman (2003).

3. National-minority states: Horinuki (2011); Soubrier (2021). Reflects: Smith and Tasiran (2010).

4. Bove *et al.* (2018).

5. Oil-for-security: Kupchan (1987); Soubrier (2019b). Equipment/capabilities nexus: Levine and Smith (2000). Lack of fighting capacity: Stork (1995).

6. National unity: Soubrier (2016). Repression: Buzan and Herrin (1998).

7. Rentier state: Anderson (1987); Beblawi and Luciani (1987); Crystal (1995); Chaudhry (1997); Karl (1997). Social pact: Gervais (2011). Diffusion of modern arms: Barnett and Wendt (1993).

8. Laurance *et al*. (2005); Surry (2006); Fleurant (2016).

9. Determination: Bergstrand (1992). Literature: A review of these developments can be found in Garcia-Alonso and Levine (2007). Model: Levine and Smith (1995; 1997).

10. Jobs: As noted by Stork and Paul (1983), other economic incentives include the intention of Western governments to reduce the petrodollars surpluses "sloshing around the short-term capital markets, of the world" (Assistant Secretary of Commerce for Economic Policy and Research Stanley Katz cited in Sampson 1977). Salience: Béraud-Sudreau *et al.* (2015). Negative causality: Dunne and Skons (2011).

11. Motives: Harkavy (1994). Cold war: Brzoska and Pearson (1994) reference the distinction established by Krause between arms exports for: (1) Bargaining power, as over access to foreign bases; (2) Structural power, as in attempts to manipulate the strategic policies of the recipient state; and (3) Hegemonic power, as in efforts to engineer favorable regional and global power balances and internal policies in recipient countries. Intensification of the role of the private sector: Laurance (1992).

12. Offsets: For a "state of the art" review of empirical knowledge regarding arms trade offsets, see Brauer and Dunne (2005). Deals: Neuman (1985). Participants: Klare (1983).

13. Dependence: Béraud-Sudreau and Meijer (2016). Small domestic market: Krause (1992). Weak industry: Brauer and Dunne (2011). Non-globalization: Dunne (1999).

14. Lack of knowledge: Hasbani (2006). Indifference: Soubrier (2016). Mission-oriented: Cordesman (2013). Dependence reduction: Soubrier (2020).

15. Argument: Kinsella (1998). Lack of self-sufficiency: Brauer (2007); Anthony (1993).

16. Soubrier (2019a).

17. Unspoken criteria: Guisnel (2011). Difficult to please: Interviews conducted by the author with several Western industrial companies in Abu Dhabi and Doha for her PhD research, between October 2013 and June 2014.

18. Reverse influence: Paul (1992). Client-patron: Handel (1982); Shoemaker and Spanier (1984). Dependent militarization: Barnett and Wendt (1993). Link: Fearon and Hansen (2018).

19. Leverage: Soubrier (2014). External partners: This hypothesis lies at the heart of the author's research agenda, with a 2020–2021 project labelled "Globalized Rentierism", pointing to the idea of a deployment of rentierism abroad by Gulf leaders as a tool of statecraft. French policy: Soubrier (2019c). Egypt-Gulf relations: Harb (2017).

20. Oil: Bove *et al*. (2018). Intermingling: Especially with the status of these monarchies benefiting from the financialization of contemporary international relations; Hanieh (2018).

References

Abdelfattah, Y.M., A.S. Abu-Qarn, P. Dunne, and S. Zaher. 2014. "The Demand for Military Spending in Egypt." *Defence and Peace Economics*. Vol. 25, No. 3, pp. 231–245. https://doi.org/10.1080/10242694.2013.763454

Anderson, L. 1987. "The State in the Middle East and North Africa." *Comparative Politics*. Vol. 20, No. 1, pp. 1–18. https://doi.org/10.2307/421917

Anthony, I. 1993. "The 'Third Tier' Countries:

Production of Major Weapons," pp. 362–383 in H. Wulf, ed. *Arms Industry Limited*. Oxford, U.K.: Oxford University Press.

Barnett, M. and A. Wendt. 1993. "Dependent State Formation and Third World Militarization." *Review of International Studies*. Vol. 19, No. 4, pp. 321–347. https://doi.org/10.1017/S0260210500118248

Beblawi, H. and G. Luciani, eds. 1987. *The Rentier State*. New York, NY: Croom Helm.

Béraud-Sudreau, L. *et al*. 2015. "Réguler le commerce des armes par le Parlement et l'opinion publique." *Politique européenne*. Vol. 48, pp. 82–121. https://doi.org/10.3917/poeu.048.0082

Béraud-Sudreau, L. and H. Meijer. 2016. "Enjeux stratégiques et économiques des politiques d'exportation d'armement: Une comparaison franco-américaine." *Revue internationale de politique comparée*. Vol. 23, No. 1, pp. 57–84. https://doi.org/10.3917/ripc.231.0057

Bergstrand, J.H. 1992. "On Modeling the Impact of Arms Reductions on World Trade," pp. 121–142 in W. Isard and C. Anderton, eds. *Economics of Arms Reduction and Peace Process*. Amsterdam, Netherlands: Elsevier Science Publisher. https://doi.org/10.1016/B978-0-444-88848-8.50010-5

Bove, V. and Brauner, J. 2016. "The Demand for Military Expenditure in Authoritarian Regimes." *Defence and Peace Economics*. Vol. 27, No. 5, pp. 609–625. https://doi.org/10.1080/10242694.2014.925325

Bove, V., C. Deiana, and R. Nisticò. 2018. "Global Arms Trade and Oil Dependence." *The Journal of Law, Economics, and Organization*. Vol. 34, No. 2, pp. 272–299. https://doi.org/10.1093/jleo/ewy007

Brauer, J. 2007. "Arms Industries, Arms Trade, and Developing Countries," pp. 973–1015 in T. Sandler and K. Hartley, eds. *Handbook of Defense Economics: Defense in a Globalized World*, Vol. 2. Amsterdam, Netherlands: Elsevier Science Publisher. https://doi.org/10.1016/S1574-0013(06)02030-8

Brauer, J. and J.P. Dunne. 2005. "Arms Trade Offsets and Development." *Africanus*. Vol. 35, No. 1, pp. 14-24.

Brauer, J. and J. Paul Dunne. 2011. "Arms Trade Offsets: What do We Know?" pp. 243-265 in C.J. Coyne ad R.L. Mathers, eds. *The Handbook on the Political Economy of War*. Cheltenham, UK: ElgarBrzoska, M. and F.S. Pearson. 1994. "Developments in the Global Supply of Arms: Opportunity and Motivation." *Annals of the American Academy of Political and Social Science*. Vol. 535, pp. 58–72. https://doi.org/10.1177/0002716294535001005

Buzan, B. and E. Herrin. 1998. *The Arms Dynamic in World Politics*, Boulder, CO: Lynne Rienner.

Chaudhry, K.A. 1997. *The Price of Wealth. Economies and Institutions in the Middle East*. Ithaca, NY: Cornell University Press.

Cordesman, A.H. 2013. *Securing the Gulf: Key Threats and Options for Enhanced Cooperation*. Washington, D.C.: Center for Strategic and International Studies.

Crystal, J. 1995. *Oil and Politics in the Gulf. Rulers and Merchants in Kuwait and Qatar*. Cambridge, U.K.: Cambridge University Press.

Dunne, P. 1999. "The Globalisation of Arms Production and Trade: Implications for the UK Economy." CAAT Inaugural Annual Lecture at the London School of Economics and Political Science (LSE).

Dunne, P. and S. Perlo-Freeman. 2003. "The Demand for Military Spending in Developing Countries." *International Review of Applied Economics*. Vol. 17, No. 1, pp. 23–48. https://doi.org/10.1080/713673166

Dunne, J.P. and E. Skons. 2011. "The Changing Military Industrial Complex." *Working Papers 1104. Department of Accounting, Economics and Finance, Bristol Business School*. Bristol, U.K.: University of the West of England.

Fearon, J. and B. Hansen. 2018. "The Arms Trade, International Alignments, and International Conflict." [Working Paper—Stanford University and University of Copenhagen].

Fleurant, A. 2016. "Declining Transparency in Reporting on Arms Trade and Military Spending: Some Observations." *Forum on the Arms Trade*. 17 May 2015. https://www.forumarmstrade.org/blog/archives/05-2016 [accessed *3 April 2020*]

Garcia-Alonso, M.D.C. and P. Levine. 2007. "Arms Trade and Arms Races: A Strategic Analysis," pp. 941–971 in T. Sandler and K. Hartley, eds. *Handbook of Defense Economics: Defense in a Globalized World*, Vol. 2. Amsterdam, Netherlands: Elsevier Science Publisher. https://doi.org/10.1016/S1574-0013(06)02029-1

Gervais, V. 2011. *Du pétrole à l'armée: les stratégies de construction de l'Etat aux Emirats arabes unis*, Paris, France: Institut de Recherche Stratégique de l'Ecole

Militaire (IRSEM).
Guisnel, J. 2011. *Armes de corruption massive*. Paris, France: La Découverte.
Handel, M., 1982. "Does the Dog Wag the Tail or Vice-Versa? Patron-Client Relations." *Jerusalem Journal of International Relations*. Vol. 6, No. 2, pp. 24–35.
Hanieh, A. 2018. *Money, Markets, and Monarchies: The Gulf Cooperation Council and the Political Economy of the Contemporary Middle East*. Cambridge, U.K.: Cambridge University Press. https://doi.org/10.1017/9781108614443
Harb, I.K. 2017. "An Economic Explanation for Egypt's Alignment in the GCC Crisis." *Arab Center Washington* D.C. 9 August 2017. http://arabcenterdc.org/policy_analyses/an-economic-explanation-for-egypts-alignment-in-the-gcc-crisis/ [accessed 21 March 2020]
Harkavy, R.E. 1994. "The Changing International System and the Arms Trade." *Annals of the American Academy of Political and Social Science.* Vol. 535, pp. 11–28. https://doi.org/10.1177/0002716294535001002
Hasbani, N. 2006. "The Geopolitics of Weapons Procurement in the Gulf States." *Defense & Security Analysis*. Vol. 22, No. 1, pp. 73–88. https://doi.org/10.1080/14751790600577181
Horinuki, K. 2011. "Controversies over Labour Naturalisation Policy and its Dilemmas: 40 Years of Emiratisation in the United Arab Emirates." *Kyoto Bulletin of Islamic Area Studies*, Vol. 4, No. 1-2, pp. 41-61.
Karl, T.L. 1997. *The Paradox of Plenty. Oil Booms and Petro-States*. Berkeley, CA: California University Press.
Kinsella D. 1998. "Arms Transfer Dependence and Foreign Policy Conflict." *Journal of Peace Research*. Vol. 35, No. 1, pp. 7–23. https://doi.org/10.1177/0022343398035001002
Klare, M.T. 1983. "The Unnoticed Arms Trade: Exports of Conventional Arms-Making Technology." *International Security.* No. 8, pp. 68–90. https://doi.org/10.2307/2538596
Krause, K. 1991. "Military Statecraft: Power and Influence in Soviet and American Arms Transfer Relationships." *International Studies Quarterly*. Vol. 35, No. 3, pp. 313–333. https://doi.org/10.2307/2600702
Krause, K. 1992. *Arms and the State: Patterns of Military Production and Trade.* Cambridge, U.K.: Cambridge University Press. https://doi.org/10.1017/CBO9780511521744
Kupchan, C. 1987. *The Persian Gulf and the West: Dilemmas of Security*. New York, NY: HarperCollins Publishers Ltd.
Laurance, E.J. 1992. "Political Implications of Illegal Arms Exports from the United States." *Political Science Quarterly.* Vol. 107, No. 3, pp. 501–533. https://doi.org/10.2307/2152442
Laurance, E.J., H. Wagenmakers and H. Wulf. 2005. "Managing the Global Problems Created by the Conventional Arms Trade: An Assessment of the United Nations Register of Conventional Arms." *Global Governance*. Vol. 11, No. 2, pp. 225–246. https://doi.org/10.1163/19426720-01102007
Levine, P. and R. Smith. 1995. "The Arms Trade and Arms Control." *The Economic Journal*. Vol. 105, No. 429, pp. 471–484. https://doi.org/10.2307/2235505
Levine, P. and R. Smith. 1997. "The Arms Trade." *Economic Policy*. Vol. 12, No. 25, pp. 335–370. https://doi.org/10.1111/1468-0327.00024
Levine, P. and R. Smith. 2000. "The Arms Trade Game: From Laissez-Faire to a Common Defence Policy." *Oxford Economic Papers*. Vol. 52, No. 2, pp. 357–380. https://doi.org/10.1093/oep/52.2.357
Neuman, S.G. 1985. "Coproduction, Barter and Countertrade: Offsets in the International Arms Market." *Orbis*. Vol. 29, No. 1, pp. 183–213.
Paul, T.V. 1992. "Influence through Arms Transfers: Lessons from the U.S.-Pakistani Relationship." *Asian Survey*. Vol. 32, No. 12, pp. 1078–1092. https://doi.org/10.1525/as.1992.32.12.00p0224m
Pierre, A.J. 1982. *The Global Politics of Arms Sales*. Princeton, NJ: Princeton University Press. https://doi.org/10.1515/9781400854271
Sampson, A. 1977. *The Arms Bazaar: From Lebanon to Lockheed*. New York, NY: Viking Press.
Shoemaker, C. and J. Spanier. 1984. *Patron-Client Relationships: Multilateral Crises in the Nuclear Age*. New York, NY: Praeger.
[SIPRI] Stockholm International Peace Research Institute. 2020. "SIPRI Arms Transfers Database." https://www.sipri.org/databases/armstransfers [accessed 21 March 2020]
Smith, R. and A. Tasiran. 2010. "Random Coefficients Models of Arms Imports." *Economic Modelling*. Vol. 27, No. 6, pp. 1522–1528. https://doi.org/10.1016/j.econmod.2010.07.017

Soubrier, E. 2014. "La diplomatie économique des pays du Golfe à l'aune du Printemps arabe: du rayonnement à la puissance," pp. 123–136 in F. Charillon and A. Dieckhoff, eds. *Annuaire Afrique du Nord Moyen-Orient 2014–2015*. Paris, France: La Documentation française.

Soubrier, E. 2016. "Mirages of Power? From Sparkly Appearances to Empowered Apparatus, Evolving Trends and Implications of Arms Trade in Qatar and the UAE," pp. 135–151 in D. DesRoches and D. Thafer, eds. *The Arms Trade, Military Services and the Security Market in the Gulf*. Berlin, Germany: Gerlach Press. https://doi.org/10.2307/j.ctt1hj9wn0.11

Soubrier, E. 2019a. "Global and Regional Crises, Empowered Gulf Rivals, and the Evolving Paradigm of Regional Security," pp. 63–66 in Project on Middle East Political Science (POMEPS), *POMEPS Studies 34: Shifting Global Politics and the Middle East*. Washington, D.C.: POMEPS.

Soubrier, E. 2019b. "The Gulf Crisis: A Case for Rethinking the Gulf Region Security Paradigm," pp. 57–73 in K. Al-Jaber and D. Thafer, eds. *The Dilemma of Security & Defense in the Gulf Region*. Washington, D.C.: Gulf International Forum.

Soubrier, E. 2019c. "Macron Diplomacy: A Jovian Prince in the Gulf." *The Arab Gulf States Institute in Washington*. 12 November 2019. https://agsiw.org/macron-diplomacy-a-jovian-prince-in-the-gulf/ [Accessed 19 March 2020]

Soubrier, E. 2020. *Gulf Security in a Multipolar World: Power Competition, Diversified Cooperation*. Washington, D.C.: Arab Gulf States Institute in Washington.

Soubrier, E. 2021. *Qatar and the United Arab Emirates: Diverging Paths to Regional and Global Power*. Boulder, CO: Lynne Rienner (to be published in 2021).

Stork J. and J. Paul. 1983. "Arms Sales and the Militarization of the Middle East." *MERIP Reports*. No. 112, pp. 5–15. https://doi.org/10.2307/3010847

Stork J. 1995. "The Middle East Arms Bazaar after the Gulf War." *MERIP Reports*. No. 197, pp. 14–19. https://doi.org/10.2307/3013311

Surry, E. 2006. "Transparency in the Arms Industry." *SIPRI Policy Paper. No. 12*. Stockholm, Sweden: SIPRI

Strategic choices by the incumbent and challenger during revolution and civil war

Kjell Hausken and Mthuli Ncube

Kjell Hausken is Professor of Economics, Faculty of Social Sciences, University of Stavanger, Stavanger, Norway. He can be reached at kjell.hausken@uis.no. Mthuli Ncube is Professor of Economics and, Managing Director, Head of Research, Quantum Global Research Lab Ltd, Bahnhofstrasse 2, in Zug, Switzerland (on leave). Professor Ncube can be reached at m.ncube@quantumglobalgroup.com.

Abstract

A game is developed where an incumbent chooses between benefits provision to the population, which decreases the probability of revolution endogenously, and fighting with a challenger. Thereafter the challenger chooses a degree of fighting, which determines rent sharing. A successful revolution enables the challenger to replace the incumbent. An unsuccessful revolution preserves the status quo, or causes standoff or coalition. The four possibilities of incumbent replacement, status quo, standoff, or coalition combine with the incumbent either repressing (providing benefits below a threshold) or accommodating (providing benefits above a threshold) the population, for a total of eight outcomes. Such a rich conceptualization of eight outcomes of civil war is missing in the literature. We show how an advantaged versus disadvantaged incumbent deters or fights with a challenger, and provides versus does not provide benefits to the population. The eight outcomes are mapped to 87 revolutions 1961-2011.

We consider a stationary situation during revolution and civil war where the incumbent and challenger face each other under the threat that the revolution may be successful (in which case the challenger replaces the incumbent). The incumbent chooses strategically in period 1 the amount of benefits provision to the population, which affects whether the revolution is successful, and chooses whether to fight the challenger fiercely or less fiercely; benefits provision below a low threshold means repression (sticks). Benefits provision above a low threshold means accommodation (carrots). Reacting to the incumbent, the challenger determines strategically in period 2 how to fight the incumbent, which affects both parties' expected utilities, rent distribution, and which of eight possible outcomes arises.[1]

The probability of successful revolution depends on the country's characteristics and is endogenized in the sense that it is maximal when the incumbent represses, and zero at the limit when the incumbent accommodates (by providing infinitely many benefits to the population). If the revolution is successful, the challenger becomes the new incumbent. Conversely, if the revolution is unsuccessful, three outcomes are logically possible: the incumbent remains in power, a standoff ensues, or a coalition is formed. This causes eight possible outcomes (see the boxes in Figure 1). The model presented in this article captures the tradeoffs and the range of possible outcomes more clearly than what is available in the literature.

The model is especially applicable for cases where the incumbent's incentives to accommodate the population hinge on the incumbent's interaction with the challenger, and the challenger has limited or no ability to organize the population in a revolutionary uprising. This is most common during civil war and revolution. Incumbents have learned to somehow coexist with the population, and often do not last otherwise. In contrast, challengers

may come and go, and may have more fluid preferences, with limited capacity or resources to influence the population.

We abstract away from the coordination problem in order to focus on the strategic interaction between the incumbent and the challenger, affected by the population which may or may not revolt. Strategic choices of the incumbent and challenger may either generate, or not generate, a revolution. Others focus on revolutions as threats to explain concessions from the elite to the working class. Some of these forces are present in a reduced way in this article. For example, the coordination problem is captured, in our model, by the endogenized probability of a successful revolution. Other forces are modeled more explicitly. For example, the incumbent's behavior depends on the threat of revolution. Plausible functional forms are assumed to enable empirical testing.

Modeling revolutions means addressing the chicken and egg problem of who moves first. In this article we choose a novel approach which we believe has not been chosen before, namely, that a revolution is sparked by how an incumbent and thereafter a challenger fight each other.[2]

The model uses eight categories of outcome based on an analysis of eighty seven revolutions from 1961 to 2011. While this article concentrates upon the model itself, the analysis leading to these categorizations has been published in a companion article in this journal.[3]

Literature review

A contest between an incumbent and a challenger has also been analyzed by Besley and Persson (2011), assuming simultaneous choices of the sizes of the armies by the two players, which determines who becomes the new incumbent. After that determination, the new incumbent determines public goods provision and revenue transfers. They predict a hierarchy from peace via repression to civil war and show that violence is associated with shocks that can affect wages and aid. Esteban, Morelli, and Rohner (2015) consider the role of incumbents in sequential conflict decisions. They find that mass killings increase with natural resources,

This article considers a stationary situation during revolution and civil war where the incumbent and challenger face each other under the threat that the revolution may be successful. It introduces a model intended to capture the tradeoffs and the range of possible outcomes better than what is currently available in the literature. A novel approach is chosen where a revolution is sparked by how an incumbent and thereafter a challenger fight each other.

polarization, institutional constraints on rent sharing, and low productivity.[4]

Besley and Persson (2010) focus on conflict within the context of state capacity and development. Foran (1993) suggests modeling the economic, political and cultural processes in revolutions. Indeed, the literature on revolutions is multifarious, more of the background and the extant literature are detailed in the companion article.[3]

The following sections, present the model, solve the model, conduct a comparative static analysis, analyze the conditions for deterrence and benefits, map the model outcomes to the observed revolutions, and conclude.

The model

The model's full list of notational symbols is given in Appendix A. We start with three definitions.

Definition 1. The incumbent is the governing player with executive power, i.e., the dictator in autocratic regimes, often with absolute sovereignty.

Definition 2. The challenger is either the elites within the regime opposing the incumbent, or some other kind of opposition. The challenger may be less organized than the incumbent (and may consist of factions with irreconcilable differences), but is at least partly united in a desire to replace the incumbent. The challenger's interaction with the population is not so strong that it can organize the population's uprising in the revolution.

Definition 3: The term fighting is interpreted broadly to capture all forms of struggle occurring during civil war and revolution such as, conflict, battle, and violence, and is additionally interpreted as a metaphor. For this latter interpretation Hirshleifer (1995, p. 28) considers fighting as a subcategory of competition. He writes, "falling also into the category of interference struggles are political

ISSN 1749-852X

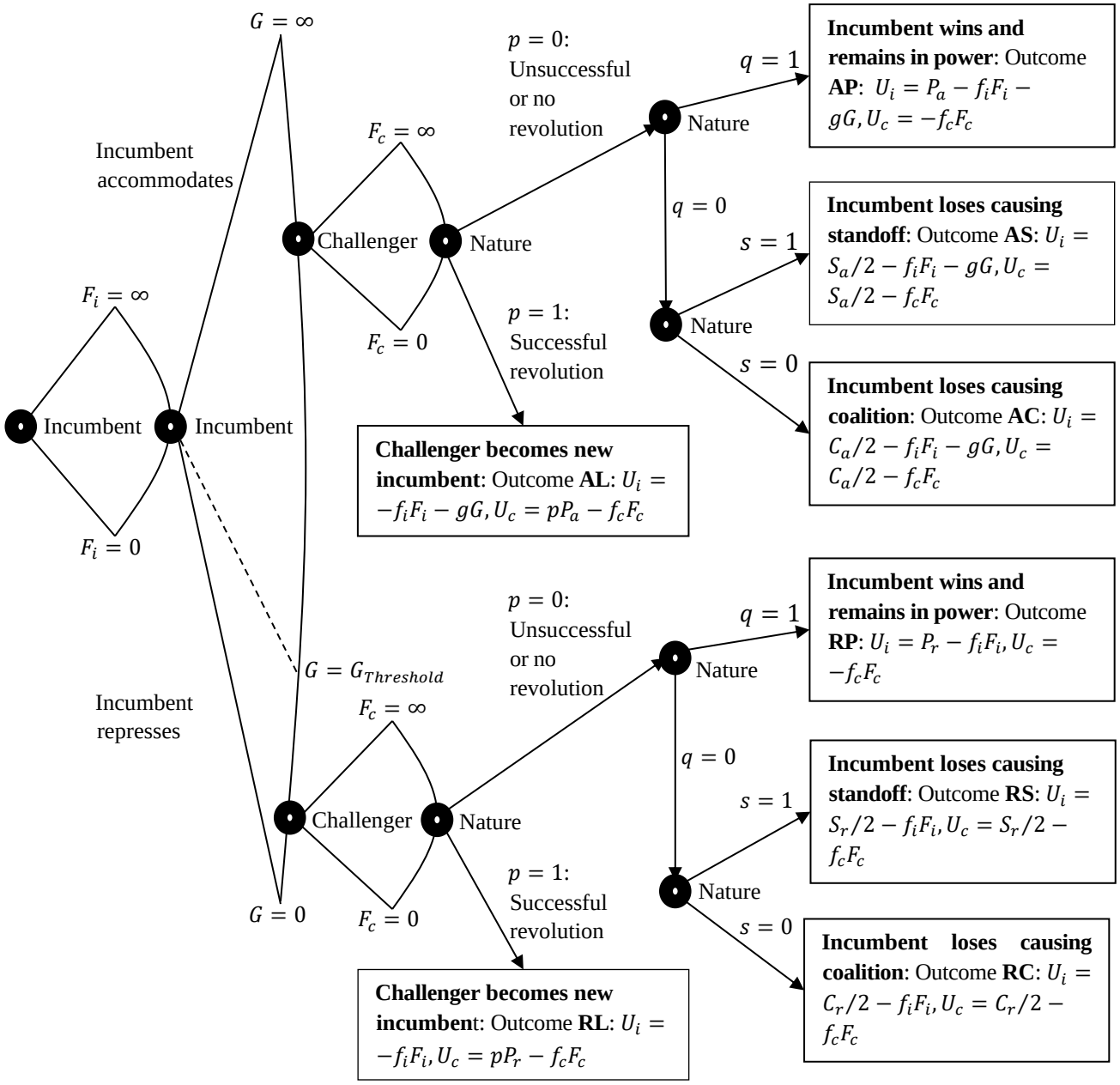


Figure 1: Revolution outcomes as a tree structure for the strategic form three-period game. Each of the eight outcomes is followed by the incumbent's and challenger's expected utilities U_i and U_c.

Note: For an explanation of the notation, see Appendix A.

campaigns, rent-seeking maneuvers for licenses and monopoly privileges , commercial efforts to raise rivals' costs, strikes and lockouts, and litigation—all being conflictual activities that need not involve actual violence" (references suppressed).

Consider the extensive form three-period game in Figure 1 starting at the left node. The two strategic risk neutral players, the incumbent and challenger, choose

ISSN 1749-852X

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

their strategies in period 1 and 2, respectively. Nature chooses its strategy in period 3, i.e., chooses probabilities which depend on the exogenous parameters and the strategies chosen by the incumbent and challenger. The game has complete and perfect information. All parameters are common knowledge. In period 1 the incumbent chooses two strategies simultaneously, reflecting a stationary situation with no need, opportunity, or relevance of choosing one strategy before the other. The first is the incumbent's fighting with the challenger. Fighting is a continuous choice variable which may vary between the two extremes $F_i=0$ and $F_i=\infty$ shown with two lines protruding from the incumbent's first decision node. The arc between the end points of the two lines illustrates that the incumbents can choose infinitely many fighting levels between 0 and ∞. The incumbent's second strategy is benefits provision to the population, which is also a continuous strategy between G=0 and G=∞, illustrated with an arc. For illustrative purposes, fighting is depicted before benefits provision in Figure 1, but no other player chooses a strategy in period 1, so the sequence is irrelevant.

We define benefits as those beyond ordinary GDP-enhancing benefits that the incumbent provides to the population with no objective of decreasing the probability of successful revolution. Examples of such benefits are public goods, socio-economic and human rights, employment. All governments provide minimal benefits to the population. Benefits provision below a low threshold, $G_{Threshold}$, determined empirically through expert judgment to be extremely insufficient, means repression (sticks). Benefits provision above that threshold means accommodation (carrots). Thus repression and accommodation are labels assigned to the amount of benefits provision. Repression is the limiting case obtained by decreasing benefits provision below the low threshold. The very idea of accommodation is that the challenger experiences the incumbent as providing something of value for the population, here interpreted with the free choice benefit provision variable G (providing a suitable distinction between repression and accommodation). Since the incumbent has to fight with the challenger under all circumstances, and accommodation is directed toward the population, no contradiction exists between fighting and accommodation. Whether the revolution is successful depends on the incumbent's benefits provision, which gets determined in period 1.[5]

The challenger observes the incumbent's choices of the fighting level F_i and amount of benefits provision G. After these observations, in period 2, the challenger chooses fighting F_c, as one continuous choice variable. The two extremes $F_c=0$ and $F_c=\infty$ are shown with two lines protruding from the challenger's decision node, and an arc between the end points. We consider a stationary situation, but the challenger is interpreted as reacting to the incumbent. Analogously in the defense and attack literature, the defender usually moves first, and the attacker moves second (Hausken and Levitin, 2012).

In period 3, Nature chooses among four strategies simultaneously, making any one of eight outcomes possible since the incumbent may accommodate or repress in period 1. If the revolution is successful, with probability p=1, the incumbent loses and the challenger becomes the new incumbent. This follows from historical evidence. Successful revolutions always demand the incumbent's removal. Unsuccessful revolutions include the possibility that the population does not revolt. If the revolution is unsuccessful, with probability p=0, three outcomes are possible: The incumbent wins against the challenger with probability q=1 and remains in power, or the incumbent loses against the challenger with probability q=0. For this latter event, a standoff ensues with probability s=1 where the incumbent and challenger disagree as to who should be in power, or a coalition is formed with probability s=0 where the incumbent and challenger share power.

A standoff is a costly stalemate or draw where the incumbent and challenger do not agree who is and should be in power, despite the incumbent officially losing. The rest of the country and world, including the military, do not know who is in power and may support one player or the other. The government apparatus is severely limited in its functioning since its various parts may support one player or the other, or may cease functioning since it is uncertain whose direction to follow. In contrast, a

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

coalition is less costly and means that the incumbent and challenger, despite their differences, agree to cooperate and compromise in a coalition. They may, for example, appoint ministers representing both the incumbent and challenger to the various government departments. They may choose some policies favored by the incumbent and other policies favored by the challenger. For a coalition everyone knows who is in power, i.e., both the incumbent and challenger through cooperation. Modeling endogenously the process by which standoff or coalition follows is extremely challenging and possibly impossible. Such a process may depend on sociological, psychological, religious, cultural, and economic factors. The personalities of the incumbent and challenger leaders, national and international political pressures, lobbying by interest groups and the business community, may also affect the outcome. Thus we assume an exogenous probability s for standoff, and 1–s for coalition. Hence the game has the eight outcomes shown in Figure 1. The eight logically possible outcomes also reflect empirically common outcomes.

We consider a rent-seeking model where the incumbent and challenger fight, exerting efforts F_i and F_c at unit costs f_i and f_c, for a rent which is allocated to the player who is incumbent after period 2. If the incumbent chooses repression, we assume that fighting is all it does. If the incumbent chooses accommodation, we assume that the incumbent, additionally, incurs a cost of providing benefits G at unit cost g to the population.

Revolution is the main fear for an incumbent involved in repression. Without benefits G, assume that the incumbent estimates the probability of successful revolution as $1/\alpha$, where α is a country-specific parameter accounting for a ruler's attempt to suppress revolts applying methods such as spies, bribes, punishments for treason, and so on (Tullock 1971, 1974). A large α decreases the probability of successful revolution. One predominant example of a country-specific characteristic increasing the probability of successful revolution, through decreasing α, is the degree of inequality exemplified by high unemployment (especially among the youth population), the population's level of education, the size of the middle class, ethnic fractionalization, the lack of institutional development, former colonialist currents in the political environment, and the country's endowments (for example, in terms of natural resource) which can make an autocrat more recalcitrant. Such factors may determine to what degree a revolution is likely and whether it is successful.

The population observes the incumbent's period 1 choice of benefits provision. The population's choice of whether to start a revolution depends probabilistically on the incumbent's period 1 choice. Often a realistic scenario, this also prevents the complexity of modeling the choices of individual citizens, and it enables focusing on the incumbent and challenger as the influential players. Thus we suppress the collective action problem analyzed extensively elsewhere for revolutions, and assume that the population makes no strategic choice.

In addition to the parameter α, assume that the incumbent can decrease the probability of successful revolution by providing benefits G. We model the probability of successful revolution, p, causing the incumbent to be replaced with the challenger, as

$$(1) \quad p = p(G) = \frac{1}{\alpha + \gamma G} \ ,$$

where α and γ are parameters specific for a given country. The parameter γ weighs benefits against country-specific characteristics increasing the probability of successful revolution α. The parameter γ captures the degree of accommodation expressed with benefits $G>0$ as opposed to repression where benefits $G=0$. If $\gamma>0$, providing incentives for the incumbent to choose $G>0$, then the incumbent accommodates, providing benefits to the population. Conversely, if $\gamma=0$, then the incumbent represses causing no benefits for the population, $G=0$. Comparing $\gamma > 0$ with $\gamma=0$ means comparing the case when there are increasing strategic effects (as γ increases) through benefits provision in the likelihood of revolution, against the case when there is no strategic effect. The usefulness of this distinction reflects the usefulness of distinguishing between endogenous and exogenous probability p of successful revolution. Endogeneity $\gamma>0$ offers a role for the incumbent to incentivize the population to refrain from

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

revolting through benefits provision G, whereas exogeneity γ=0 offers no such role.

When both, attempts to suppress revolution and benefits are low (α=1 and G=0), a successful revolution is guaranteed. Most countries have α>1, and as G increases, the probability of successful revolution decreases. Revolution is less likely when suppression, and benefits versus suppression and benefits (α, γ, and G) are large. If the revolution is unsuccessful, with probability 1–p, the incumbent and the challenger fight for the rent. We use the common ratio form contest success function (Skaperdas, 1996; Tullock, 1980). The incumbent wins with probability

$$(2) \quad q = \frac{F_i}{F_i + F_c} \text{ ,}$$

earning the incumbent rent P_x, where x=R means repression and x=A means accommodation. The incumbent loses against the challenger with the remaining probability $1-q = F_c/(F_i + F_c)$, in the sense of causing a standoff with utility $S_x/2$ to each player with probability s and coalition with utility $C_x/2$ to each player with probability 1–s where s is an exogenously determined parameter, i.e.,

$$(3) \quad K_x = sS_x/2 + (1-s)C_x/2 \text{ .}$$

Hence the incumbent and challenger share the standoff and coalition utilities equally. Coalition formation is costly, and standoff is even more costly, i.e., $P_x > C_x > S_x$. Conversely, if the revolution is successful, with probability p, the incumbent loses, and the challenger who represents the population wins. When the incumbent loses, the rent gets transferred in its entirety to the challenger. As an example, former Tunisian President Zine El Abidine Ben Ali fled to Saudi Arabia on 14 January 2011, 28 days after the 17 December 2010 uprising, losing his rent.

The three probabilities p, q, and s determine the eight outcomes in Figure 1. Combining these three probabilities with the utilities P_x, C_x, and S_x dependent on which outcome occurs, the incumbent's expected utility U_i is

$$(4) \quad U_i = (1-p)(qP_x + (1-q)K_x) - f_iF_i - gG \text{ ,}$$

where p is given by (1), q is given by (2), and K_x is given by (3). When p=1, the first term with 1–p is 0 since the incumbent loses the revolution, gains nothing, but incurs expenditures f_iF_i+gG. Conversely, when p=0, the incumbent earns P_x when q=1 due to remaining in power and winning against the challenger. When p=q=0, the incumbent loses against the challenger causing a standoff (s=1) with benefit $S_x/2$ or coalition (s=0) with benefit $C_x/2$. The incumbent in (4) strikes a balance between benefits (the positive terms) and costs (the two negative terms). This balance is more realistic than a budget constraint on the optimization which would decrease from two strategic choice variables to one strategic choice variable. Such a reduction would imply that more fighting F_i would give less benefits provision, and vice versa. We consider the incumbent to make these two choices separately.

Analogously, the challenger's expected utility U_c is

$$(5) \quad U_c = (1-p)(1-q)K_x + pP_x - f_cF_c \text{ ,}$$

where p is given by (1), q is given by (2), and K_x is given by (3). When p=1, the first term with 1–p is 0 since the incumbent loses the revolution and the challenger gets the rent P_x with expenditure f_cF_c. Conversely, when p=0, the challenger gets no benefit when losing against the incumbent (q=1). But, when winning against the incumbent, p=q=0, the challenger gets $S_x/2$ when a standoff occurs (s=1), and gets $C_x/2$ when a coalition occurs (s=0). The challenger in (5) also strikes a balance between benefits (the positive terms) and costs (the one negative term), which is more realistic than a budget constraint which would eliminate strategic choice for the challenger.

In (4) and (5) repression is characterized with x=R and γ=0 causing G=0, and accommodation is characterized with x=A and γ>0. If α is large, the incumbent can rely on fighting to earn a large fraction of the rent. If α is small, the incumbent additionally has to provide benefits G to earn a large fraction of the rent. The incumbent's expected utility U_i reflects the fact that revolution is repelled (the revolution does not succeed). In that case its expected utility derives from expected rents from a subsequent standoff, coalition, or outright win, but

dampened by fighting costs and public goods provision. The challenger's expected utility U_c reflects the expected rents from a coalition, standoff, or outright success of the revolution, all dampened by fighting costs. The model implicitly reflects that the incumbent's rent P_x from winning a conflict with the challenger is discontinuous in the incumbent's benefits provision G to the population at the threshold $G_{Threshold}$, which is a low value above zero. That discontinuity follows intuitively since the population reacts differently when it decides that the incumbent represses as opposed to accommodates. That reaction by the population affects the contest between the incumbent and the challenger.

Summing up, the incumbent chooses the two strategies fighting F_i and benefits provision G in period 1. The challenger chooses fighting F_c in period 2. The probability of revolution decreases as benefits provision G increases. The game has eight outcomes shown in Figure 1.

Solving the model

We solve the model for the optimal levels of fighting for the incumbent and challenger, F_i and F_c, and benefits provision, G, that maximize the expected utilities in (4) and (5).

This section provides a narrative description of five theorems, their details and proofs can be found in Appendix B.

Theorems 1 and 2

Theorem 1 provides the equilibrium optimal levels of fighting F_i and F_c, benefits provision G, and the probability p of successful revolution, depending on the size P_x of the incumbent's rent.

Theorem 2 specifies how the incumbent deters the challenger without benefit provision G when the incumbent's rent P_x is large, provides benefits G without deterrence when the rent P_x is intermediate, provides neither benefits G nor deterrence when the rent P_x is small, and represses the population when the weight γ of benefits provision is zero.

Five insights are provided by Theorems 1 and 2. First, when the incumbent's rent P_x from winning a conflict with the challenger is greater or equal to the lower rent K_x of losing causing standoff or coalition (once the costs of fighting have been factored in), the incumbent is in an advantaged or superior position (since a large rent P_x is advantageous for the incumbent), a position described as

$$P_x \geq \left(2\frac{f_i}{f_c}+1\right)K_x\,.$$

This inequality provides two understandings about when the incumbent deters. One is that the incumbent deters when P_x is large compared with K_x, which means that the incumbent is motivated by the large rent of winning and remaining in power compared with the lower rent of losing causing standoff or coalition. This means that a large P_x may be quite detrimental for a country in that it can induce an incumbent to suppress all opposition. The other is, intuitively, that the incumbent deters when its unit cost f_i of fighting is low compared with the challenger's unit cost f_c of fighting. Furthermore, an advantaged incumbent does not provide benefits, and the revolution probability $p=1/\alpha$ is at its maximum. Thus, benefits provision and whether or not a revolution occurs is of no concern for the incumbent when choosing whether or not to deter the challenger. Deterrence is a matter between the incumbent and the challenger, where the population plays no role. Consequently, this inequality does not depend on benefits provision. Summing up, the incumbent is advantaged, deters the challenger, and does not care about the population.

The second insight is that when the incumbent's rent is in an intermediate position. In this case, the incumbent is not sufficiently advantaged to deter the challenger (as described in insight 1 above), but can (and does) provide benefits G since it fears the consequences of a revolution by the population, a position described as

$$K_x + 2\sqrt{\frac{f_i K_x(g\alpha^2-\gamma K_x)}{f_c\gamma}} \leq P_x < \left(2\frac{f_i}{f_c}+1\right)K_x$$

and $\gamma>0$.

The third insight is that where the incumbent is so disadvantaged that it can neither deter the challenger nor provide benefits to the population. Therefore, the incumbent tries instead, as best it can, to survive from

day to day with a fighting challenger and an unsupportive population, a position described as

$$P_x < K_x + 2\sqrt{\frac{f_i K_x(g\alpha^2 - \gamma K_x)}{f_c \gamma}}.$$

The fourth insight is that mathematically the two inequalities in the second insight (describing the lower and upper bound of the incumbent's rent P_x) pull in different directions.

The rightmost inequality is satisfied when the lower rent of losing causing standoff or coalition K_x is large, the incumbent's unit cost of fighting f_i is large, and the challenger's unit cost of fighting f_c is small. Conversely, the leftmost inequality is satisfied when K_x is small, f_i is small, f_c is large, unit cost of benefits provision to the population g is small, α is small, and γ is large. The rightmost inequality specifies whether or not to deter the challenger, and thus f_i, f_c, K_x are present. The leftmost inequality specifies whether or not to provide benefits G to the population, and thus all the parameters are present. The upper bound is often larger than the lower bound allowing benefits provision, but not necessarily. For example, benefits are not provided when f_i, K_x, or γ is very low, or f_c, g, or α is very large.[6]

Fifth, if the weight of benefits provision relative to country-specific factors is zero, this guarantees repression since benefits provision entails no value.

Comparative static analysis

Theorem 3

With no benefits provision G, challenger fighting and incumbent fighting, Theorem 3 shows how the incumbent fights less if a revolution is probable. For the challenger the results are mixed, with less fighting as challenger-detrimental country-specific factors decrease (provided that the rent P_x is low). The incumbent fights more if the rent is valuable. A more valuable rent causes the incumbent to fight more, while the challenger fights less if the rent initially is sufficiently valuable. Conversely, higher value K_x for coalition and standoff causes less incumbent fighting, whereas an initially low K_x causes challenger fighting.

Theorem 4

With no benefits provision G, no challenger fighting but incumbent fighting occurs. Theorem 4 confirms Theorem 3 where the incumbent fights less if a revolution is probable. However, higher value K_x for coalition and standoff causes higher incumbent fighting. This result, opposite to Theorem 3, follows since the challenger is already deterred and benefits provision G does not occur.

Theorem 5

With some benefits provision, challenger fighting, and incumbent fighting, Theorem 5 shows that increasing the weight of benefits provision G to country-specific factors (such as high youth unemployment) α, increases G when α is large, and increases incumbent fighting F_i. In contrast, increasing α causes lower G. An increasingly valuable rent causes more benefits provision, a less probable revolution, and more incumbent fighting if the coalition and standoff value K_x is sufficiently low. An increasing value for coalition and standoff causes less benefits provision and a more probable revolution when the rent is sufficiently high. As the incumbent's unit cost of fighting increases, benefits provision decreases and a revolution becomes more probable. Conversely, as the challenger's unit cost of fighting increases, benefits provision increases and a revolution becomes less probable.

Analyzing conditions for deterrence and benefits provision

In this section we analyze the conditions for deterrence and benefits provision. To enhance our insight Figure 2 plots three regions in two-dimensional parameter space for the benchmark parameter values $f_i=f_c=g=\gamma=K_x=1$ and $\alpha=1.1$.

The incumbent's rent P_x is especially interesting and varies vertically, and one of the six parameters varies horizontally while the other five parameters are kept at their benchmark values. Thus, when P_x is large, i.e., more than $2\frac{f_i}{f_c}+1$ times as great as the rent K_x which weighs

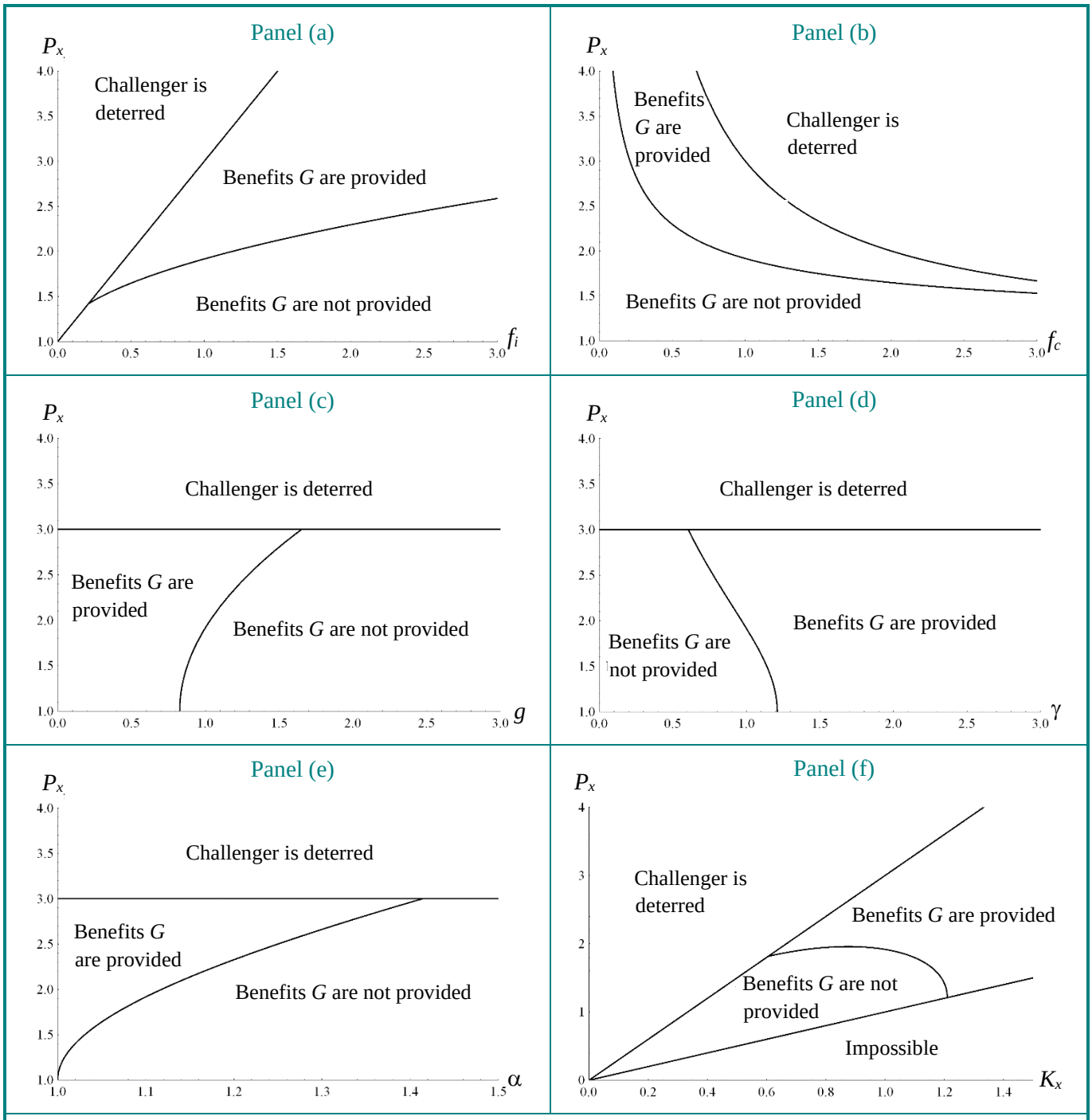


Figure 2*:* Three regions in parameter space for when the challenger is deterred and when benefits G are provided versus not provided, with benchmark parameter values $f_i=f_c=g=\gamma=K_x=1$ and $\alpha=1.1$.

standoff and coalition, the challenger is deterred (Theorems 1 and 2). The expression $2\frac{f_i}{f_c}+1$ increases when the ratio $\frac{f_i}{f_c}$ of the incumbent's unit fighting cost divided by the challenger's unit fighting cost increases.

ISSN 1749-852X

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Hence, when the incumbent is disadvantaged with a high unit fighting cost relative to the challenger ($\frac{f_i}{f_c}$ is high), then $2\frac{f_i}{f_c}+1$ is high and deterring the challenger is unlikely unless P_x is very large, i.e., $P_x \geq \left(2\frac{f_i}{f_c}+1\right)K_x$. When P_x is intermediate, benefits G are provided to the population and the challenger is not deterred (Theorem 2). When P_x is small, benefits G are not provided to the population and the challenger is not deterred (Theorem 2). In Figure 2, panel (a), a low unit cost f_i of fighting combined with a large incumbent rent P_x enables the advantaged incumbent to deter the challenger. As f_i increases or P_x decreases, the incumbent provides benefits G to the population to ensure its support and decrease the probability of revolution, while fighting with the challenger. As f_i increases or P_x decreases further, the disadvantaged incumbent does not provide benefits G to the population but does fight with the challenger.

In Figure 2, panel (b), the challenger is deterred when P_x is large and the challenger suffers a large unit cost f_c of fighting. As f_c decreases or P_x decreases, the incumbent provides benefits G. For low f_c or low P_x, the incumbent provides no benefits G.

In Figure 2, panel (c), the challenger is deterred when $P_x>3$, independently of g. A low unit cost g of benefits provision G induces the incumbent to provide benefits. Conversely, a large g causes no benefits which are too expensive. The indifference curve between providing versus not providing benefits increases when g increases since a large rent P_x, $P_x<3$, provides additional incentives to the incumbent to provide benefits to prevent a revolution.

In Figure 2, panel (d), the challenger is also deterred when $P_x>3$, but the indifference curve decreases in γ. Furthermore, benefits G are not provided when γ is low. Conversely, when g is large, benefits G are provided.[7]

In Figure 2, panel (e), the challenger is deterred when $P_x>3$. When α has its minimum value $\alpha=1$, a successful revolution is guaranteed when G=0, and thus the incumbent is guaranteed to provide benefits G. As α increases above 1, a low rent P_x induces the incumbent not to provide benefits. When $\alpha > \sqrt{2} \approx 1.14$ benefits are never provided since the probability of revolution is low and decreasing the probability further is not worthwhile for the incumbent.

In Figure 2, panel (f), the challenger is deterred when $P_x>3K_x$. The event $P_x<K_x$ is excluded by assumption since the rent P_x is preferable to standoff and coalition. Between these two sectors, the incumbent provides benefits G when P_x is large, and does not provide benefits when P_x is small.

Mapping the model outcomes to observed revolutions

Revolutions:1961-2011

Table C1 (in Appendix C) lists the 87 largest and most well-known revolutions during 1961-2011, linked to the theoretical analysis in the previous sections by categorization into the eight outcomes shown in column 3 from the left in Figure 1, i.e., incumbent wins and remains in power (RP), incumbent loses causing standoff (RS), incumbent loses causing coalition (RC), challenger becomes new incumbent (RL), incumbent wins and remains in power (AP), Incumbent loses causing standoff, (AS), Incumbent loses causing coalition (AC), and Challenger becomes new incumbent (AL). RL occurs 46 times (53%), RP 21 times (27%) RC 12 times (15%), AL seven times (4%), and AC once (1%), and RS, AP, AS never, i.e., 46+21+12+7+1=87. The route of each revolution is traced through the tree structure in Figure 1. Revolutions are considered where the population and/or challenger seek to replace the incumbent. The authors and research assistants researched each revolution and agreed on each outcome. It was determined whether the incumbent is repressive (letter "R" in the outcome). The 15 Arab Spring revolutions started by the population perceiving a repressive incumbent. The 2011 Egypt revolution is RL since the incumbent Hosni Mubarak was replaced with the challenger Mohamed Hussein Tantawi on February 11, 2011. During 1961-1990 in South Africa the incumbent repressed the population through apartheid policies, causing anti-apartheid, replacement of the incumbent, and RL. An accommodative incumbent gives the letter "A" in the outcome. For the 1964 Zanzibar

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Revolution in Tanzania the incumbent (Sultan of Zanzibar and his mainly Arab government) was accommodative. The mainly African Afro-Shirazi Party and left-wing Umma Party mobilized a revolution 12 January 1964, influenced by parliamentary under-representation despite winning 54% in the July 1963 election. The incumbent was replaced with the challenger, Abeid Karume, causing AL.[8]

Table C1 assumes the parameter values $f_i=f_c=g=K_R=K_A=1$, which are the same benchmark parameter values used in the previous section and Figure 2. We assume $P_R=2$ since the incumbent's rent when repressing is larger than the rent for standoff or coalition. We assume $P_A=2.9$ since the incumbent's rent when accommodating is larger than the incumbent's rent when repressing.[9]

Column 4 from the left in Table C1 shows the FSI (Fragile States Index) scaled from 0 to 120. The FSI is inversely proportional to α in equation (1) since revolutions are more likely to be successful in fragile countries. Column 5 shows α defined as $\alpha \equiv 240/FSI$ which gives scaling from $\alpha=2$ when FSI=120 to $\alpha=\infty$ when FSI=0. Using equation (1), the value $\alpha=2$ gives p=1/2 when G=0, which gives 50% probability of successful revolution in a maximally fragile state where the incumbent does not provide benefits. This range for α is estimated to be descriptive. In contrast, $\alpha=\infty$ gives p=0 regardless of G, which gives 0% probability of successful revolution in a minimally fragile state regardless of benefits provision. The highest FSI in column 4 is FSI=112.3 for the Second Sudanese Civil War and the Darfur Rebellion, causing $\alpha=2.137$. The Lowest FSI in column 4 is FSI=18.6 for The Troubles (Northern Ireland), causing $\alpha=12.903$.[10]

Column 6 shows GDP per capita in current 2019 US$ in the given country in the year when the revolution started. That is, the GDP per capita in the year the revolution started was determined, and was converted into the 2019 US$ value by adjusting for inflation. We assume that GDP per capita affects γ in equation (1). The effect cannot be proportional since GDP per capita varies from 56.535 for Malawi to 48268.591 for Kuwait. Column 7 shows γ defined as $\gamma \equiv 2\log_{10}(GDP/capita)$ which gives scaling from $\gamma=3.505$ for Malawi to $\gamma=9.637$ for Kuwait.[11]

Using equations (4), (5), and (6) for each of the 87 revolutions, the rightmost six columns in Table C1 show the equilibrium levels of fighting F_i and F_c, benefits provision G, the probability p of successful revolution, and the expected utilities U_i and U_c. The value of p is typically larger for countries with low to α, low γ, and low G. Table C1 illustrates how incumbents, challengers, populations, policy makers, and others can analyze how various conditions affect various outcomes.

Conclusion

The article analyzes revolutions, revolutionary uprisings, and civil war. We model both the reasoning processes of the incumbent and challenger (affected by the probability that the population revolts) and the outcomes. The incumbent chooses benefits provision to the population, which determines the probability of revolution endogenously. Benefits provision below a threshold means repression, with high probability of revolution. Increasing benefits provision above the threshold means accommodation, with decreasing probability of revolution. The incumbent also chooses the level of fighting with the challenger. The challenger observes the incumbent's choices of benefits provision and fighting, and chooses a fighting level, which determines how rents are divided between the incumbent and challenger.

The game has eight possible outcomes. If the revolution is successful, the challenger becomes the new incumbent. Conversely, if the revolution is unsuccessful, three events are possible: the incumbent remains in power, a standoff ensues, or a coalition is formed. The incumbent weighs the benefit of obtaining low probability of revolution against the effort costs, i.e., fighting and providing benefits to the population. The incumbent does not want to obtain low probability of revolution at any cost. Thus a frequent outcome, such as repression combined with losing the revolution, may arise because it gives the incumbent the highest expected utility.

We show that the incumbent fights less if a revolution is probable. An advantaged incumbent can deter the

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

challenger and can ignore benefits provision to the population when the population does not pose a revolutionary threat. An intermediately advantaged incumbent fights with the challenger and provides benefits to the population to the extent these benefits decrease the revolutionary threat. A disadvantaged incumbent fights with the challenger and does not provide benefits to the population and thus the probability of revolution increases. The model is applicable as a tool adjusting the many parameters to determine the outcome of revolutions.

Notes

The authors acknowledge the assistance of Kate Ryan and Habiba Ben-Barka, in data-handling and research assistance. The authors thank two anonymous referees of this journal and the editors for useful comments.

1. We do not model the armed forces as a separate player since so many possibilities exist for how it operates. Most commonly the incumbent controls the army, or the army chooses to be loyal to the incumbent. Examples also exist where the armed forces support the population. It is also possible, at least in theory, that the armed forces may support the challenger. Our approach allows all these three interpretations.

2. If the incumbent moves first a reason may exist, e.g., financial depression (caused, for instance, by depletion of natural resources) causing the incumbent to tax the population which in turn may cause a revolution. A second possibility is that the challenger moves first, but for the challenger to gain momentum some precondition is needed. Third, if the population moves first by rioting, they do so for a reason, e.g., an oppressive regime.

3. See Hausken and Ncube (2019) for a companion article detailing more of the background and the extant literature.

4. See e.g., Dixit (1987) for comparisons of simultaneous and sequential moves.

5. Many of the countries in which revolts take place are places in which public services are not provided at high levels, partly because of low GDP and partly because of form of government. Olson (1965) suggests that dictators will provide GDP increasing levels of public services but not others. Benefits to the population thus exceed zero regardless of whether a revolt occurs, simply because it is in the rulers' interest to provide them.

6. For further detail see equation (11) in Appendix B where the square root in the left inequality is positive when $g\alpha^2 > \gamma K_x$ which provides a constraint for these four parameters.

7. Since the multiplicative term γG in the denominator in equation (5) is then too small which does not decrease the probability of revolution sufficiently.

8. Thus, e.g., the 1994 Rwandan genocide is not included since it was initiated by the Hutu majority incumbent slaughtering the Tutsi. The first and second Congo wars, since 1995, are not included since they were initiated by the neighboring Rwanda and Uganda invading Congo. In contrast, the May 1968 French rebellion, which does not qualify as a civil war, is included since it was initiated by student protests against capitalism, traditional institutions, consumerism, American imperialism, and values and order more generally, spreading to strikes involving 11 million workers in factories for about two weeks.

9. We assume $P_A<3$ to ensure $P_A < \left(2\frac{f_i}{f_c}+1\right)K_A$ in equation (6) in Appendix B.

10. The FSI, https://fragilestatesindex.org/, is available yearly 2006-2019. For Table C1, the actual year has been chosen when possible. For revolutions before 2006, the 2006 numbers have been used. These may be inaccurate for revolutions in, e.g., 1961, but are estimated to be better than using other proxies.

11. https://data.worldbank.org/indicator/ny.gdp.pcap.cd, https://countryeconomy.com/gdp. For missing data, the earliest year of available data has been used.

References

Besley, T. and T. Persson. 2010. "State Capacity, Conflict, and Development." *Econometrica*. Vol. 78, No. 1, pp. 1-34. https://doi.org/10.3982/ECTA8073

Besley, T. and T. Persson. 2011. "The Logic of Political Violence." *Quarterly Journal of Economics.* Vol. 126, No.3, pp. 1411-1445. https://doi.org/10.1093/qje/qjr025

Dixit, A. 1987. "Strategic Behavior in Contests." *American Economic Review*, Vol. 77, No. 5, pp. 891-898.

Esteban, J., M. Morelli, and D. Rohner. 2015. "Strategic Mass Killings." *Journal of Political Economy. Vol.*

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

123, No. 5, pp. 1087-1132.
https://doi.org/10.1086/682584

Foran, J. 1993. "Theories of Revolution Revisited: Toward a Fourth Generation?" *Sociological Theory*. Vol. 11, No. 1, pp. 1-20.
https://doi.org/10.2307/201977

Hausken, K., and G. Levitin. 2012. "Review of Systems Defense and Attack Models." *International Journal of Performability Engineering*, Vol. 8, No. 4, pp. 355-366.

Hausken, K., and M. Ncube. 2019. "The Incumbent, Challenger, and Population During Revolution and Civil War*." The Economics of Peace and Security Journal*. Vol. 14, No. 2, pp. 32–41.
https://doi.org/10.15355/epsj.14.2.32

Olson, M. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups* (Vol. 124). Cambridge, MA: Harvard University Press.

Skaperdas, S. 1996. "Contest Success Functions." *Economic Theory*. Vol. 7, No. 2, pp. 283-290.
https://doi.org/10.1007/s001990050053

Tullock, G. 1971. "The Paradox of Revolution." *Public Choice*. Vol 11, No. 1, pp. 89-99.
https://doi.org/10.1007/BF01726214

Tullock, G. 1974. *The Social Dilemma: The Economics of War and Revolution*. Blacksburg, VA: University Publications.

Tullock, G. 1980. "Efficient Rent-Seeking." pp. 97-112 in J. M. Buchanan, R. D. Tollison, and G. Tullock, eds. *Toward a Theory of the Rent-Seeking Society*. College Station: Texas A. and M. University Press.

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Appendix A: Notation

Free choice variables

- F_i Incumbent's fighting
- G Incumbent's benefits provision to the population
- F_c Challenger's fighting

Dependent variables

- p Probability of successful revolution
- q Probability that the cumbent wins the fight with the challenger
- U_i Incumbent's expected utility
- U_c Challenger's expected utility

Parameters

- f_i Incumbent's unit cost of fighting
- g Incumbent's unit cost of benefits provision to the population
- f_c Challenger's unit cost of fighting
- $1/\alpha$ Probability of successful revolution without benefits provision G
- γ Weight of benefits provision G relative to α
- P_x Incumbent's rent dependent on x, x=R,A, when winning against the challenger
- $S_x/2$ Rent to each player dependent on x, x=R,A, when standoff
- $C_x/2$ Rent to each player dependent on x, x=R,A, when coalition
- x=R Incumbent represses defined as $0 \leq G \leq G_{Threshold}$
- x=A Incumbent accommodates defined as $G > G_{Threshold}$
- s Probability of standoff
- K_x $sS_x/2+(1-s)C_x/2$
- $G_{Threshold}$ Incumbent's threshold for benefits provision to the population

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Appendix B: Theorems and Proofs

Theorem 1 Detail

The equilibrium optimal levels of fighting and benefits provision, and the probability of successful revolution, are

$$F_i = \begin{cases} \dfrac{f_c(P_x-K_x)^2(\alpha+\gamma G-1)}{4f_i^2K_x(\alpha+\gamma G)} & when\ P_x < \left(2\dfrac{f_i}{f_c}+1\right)K_x \\ \dfrac{K_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)} & otherwise \end{cases}$$

$$G = \begin{cases} \dfrac{1}{2}\sqrt{\dfrac{f_c(P_x-K_x)^2+4f_iK_x^2}{f_igK_x\gamma}}-\dfrac{\alpha}{\gamma} & when\ K_x+2\sqrt{\dfrac{f_iK_x(g\alpha^2-\gamma K_x)}{f_c\gamma}} \le P_x < \left(2\dfrac{f_i}{f_c}+1\right)K_x\ and\ \gamma>0 \\ 0 & otherwise \end{cases} \quad (6)$$

$$F_c = \begin{cases} \dfrac{\left(2f_iK_x-f_c(P_x-K_x)\right)(P_x-K_x)(\alpha+\gamma G-1)}{4f_i^2K_x(\alpha+\gamma G)} & when\ P_x < \left(2\dfrac{f_i}{f_c}+1\right)K_x \\ 0 & otherwise \end{cases}$$

$$p = \begin{cases} \dfrac{2\sqrt{f_igK_x}}{\sqrt{\gamma}\sqrt{f_c(P_x-K_x)^2+4f_iK_x^2}} & when\ K_x+2\sqrt{\dfrac{f_iK_x(g\alpha^2-\gamma K_x)}{f_c\gamma}} \le P_x < \left(2\dfrac{f_i}{f_c}+1\right)K_x\ and\ \gamma>0 \\ \dfrac{1}{\alpha} & otherwise \end{cases}$$

Proof:

We solve the game with backward induction starting with period 2. Differentiating the challenger's expected utility in (5) and equating with zero gives

$$\frac{\partial U_c}{\partial F_c} = \frac{F_iK_x(\alpha+\gamma G-1)}{(F_i+F_c)^2(\alpha+\gamma G)} - f_c = 0 \Rightarrow F_c = \begin{cases} \sqrt{\dfrac{F_iK_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)}} - F_i & when\ \dfrac{K_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)} > F_i \\ 0 & otherwise \end{cases} \quad (7)$$

Inserting (7) into (4) to determine the incumbent's period 1 expected utility gives

$$U_i = \begin{cases} \sqrt{\dfrac{\alpha+\gamma G-1}{\alpha+\gamma G}}\left(\dfrac{\sqrt{F_if_c}(P_x-K_x)}{\sqrt{K_x}}+\sqrt{\dfrac{\alpha+\gamma G-1}{\alpha+\gamma G}}K_x\right)-f_iF_i-gG & when\ \dfrac{K_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)} > F_i \\ \dfrac{\alpha+\gamma G-1}{\alpha+\gamma G}P_x-f_iF_i-gG & otherwise \end{cases} \quad (8)$$

where $P_x>K_x$ since $P_x>C_x>S_x$ and $0\le s\le 1$. Differentiating (8) and equating with zero yield

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

$$\frac{\partial U_i}{\partial F_i}=\begin{cases}\dfrac{\sqrt{f_c}(P_x-K_x)}{2\sqrt{F_iK_x}}\sqrt{\dfrac{\alpha+\gamma G-1}{\alpha+\gamma G}}-f_i=0 \ when \ \dfrac{K_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)}>F_i\\ -f_i \ otherwise\end{cases}$$

(9)
$$\frac{\partial U_i}{\partial G}=\begin{cases}\dfrac{1}{2(\alpha+\gamma G)^2}\left(2\gamma K_x-\dfrac{\sqrt{F_if_c}(P_x-K_x)\gamma\sqrt{\alpha+\gamma G}+2g\sqrt{K_x}\sqrt{\alpha+\gamma G-1}(\alpha+\gamma G)^2}{\sqrt{K_x}\sqrt{\alpha+\gamma G-1}}\right)=0\\ \qquad when \ \dfrac{K_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)}>F_i\\ -g \ otherwise\end{cases}$$

which are solved to yield (6) where F_c follows from inserting G and F_i into (7), and the inequality simplifies to

(10)
$$\frac{K_x(\alpha+\gamma G-1)}{f_c(\alpha+\gamma G)}>F_i=\frac{f_c(P_x-K_x)^2(\alpha-1)}{4f_i^2K_x\alpha}\Rightarrow P_x<\left(2\frac{f_i}{f_c}+1\right)K_x$$

which is independent of γ and G. The second order conditions and Hessian matrix are

$$\frac{\partial^2 U_i}{\partial F_i^2}=\begin{cases}\dfrac{\sqrt{f_c}(P_x-K_x)}{4F_i^{3/2}\sqrt{K_x}}\sqrt{\dfrac{\alpha+\gamma G-1}{\alpha+\gamma G}} \ when \ P_x<\left(2\dfrac{f_i}{f_c}+1\right)K_x\\ 0 \ otherwise\end{cases}$$

$$\frac{\partial^2 U_i}{\partial G^2}=\begin{cases}-\dfrac{\gamma^2\left(8\sqrt{F_if_c}K_x^{3/2}(\alpha+\gamma G-1)^{3/2}\sqrt{\alpha+\gamma G}+F_if_c(P_x-K_x)(\alpha+\gamma G)(4\alpha-3+4\gamma G)\right)}{4\sqrt{F_if_cK_x}(\alpha+\gamma G-1)^{3/2}(\alpha+\gamma G)^{7/2}}\\ \qquad when \ P_x<\left(2\dfrac{f_i}{f_c}+1\right)K_x\\ 0 \ otherwise\end{cases}$$

(11)
$$\frac{\partial^2 U_i}{\partial F_i\partial G}=\frac{\partial^2 U_i}{\partial G\partial F_i}=\begin{cases}\dfrac{\gamma\sqrt{f_c}(P_x-K_x)}{4\sqrt{F_iK_x}\sqrt{\alpha+\gamma G-1}(\alpha+\gamma G)^{3/2}} \ when \ P_x<\left(2\dfrac{f_i}{f_c}+1\right)K_x\\ 0 \ otherwise\end{cases}$$

$$|H|=\begin{vmatrix}\dfrac{\partial^2 U_i}{\partial F_i^2} & \dfrac{\partial^2 U_i}{\partial F_i\partial G}\\ \dfrac{\partial^2 U_i}{\partial G\partial F_i} & \dfrac{\partial^2 U_i}{\partial G^2}\end{vmatrix}=\frac{\partial^2 U_i}{\partial F_i^2}\frac{\partial^2 U_i}{\partial G^2}-\frac{\partial^2 U_i}{\partial F_i\partial G}\frac{\partial^2 U_i}{\partial G\partial F_i}$$

$$=\left\{\begin{cases}-\dfrac{\gamma^2(P_x-K_x)\sqrt{f_c}}{2F_i(\alpha+\gamma G)^3}\left(\dfrac{\sqrt{K_x}\sqrt{\alpha+\gamma G-1}}{\sqrt{F_i}\sqrt{\alpha+\gamma G}}+\dfrac{\sqrt{f_c}(P_x-K_x)(2\alpha-1+2\gamma G)}{4K_x(\alpha+\gamma G-1)}\right)\\ \qquad when \ P_x<\left(2\dfrac{f_i}{f_c}+1\right)K_x\\ 0 \ otherwise\end{cases}\right\}\geq 0$$

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

The second order conditions are always satisfied as negative, and the Hessian matrix is always negative semi-definite, since $\gamma \geq 0$, $\alpha \geq 1$, and $P_x > K_x$, which cause $\alpha + \gamma G - 1 \geq 0$ and $2\alpha - 1 + 2\gamma G \geq 0$ regardless of $G \geq 0$.

The expected utilities U_i and U_c follow from inserting (6) into (4) and (5). In the first line of each equation in (6), the incumbent's fighting F_i is low and does not deter the challenger, i.e., $F_c > 0$. Conversely, in the second line, labeled "otherwise", F_i is large deterring the challenger, i.e., $F_c = 0$.

For simplicity and to ensure better comparison, we hereafter approximate benefits provision G below the threshold G, $0 \leq G \leq G_{Threshold}$, which means negligible benefits provision, with no benefits provision G=0. The actual benefits provision when $0 \leq G \leq G_{Threshold}$, is determined by replacing G with $G_{Threshold}$.

Theorem 2 Detail

The incumbent deters the challenger without benefit provision $F_c = G = 0$ when $P_x \geq \left(2\frac{f_i}{f_c} + 1\right) K_x$, provides benefits $G > 0$ without deterrence $F_c > 0$ when $K_x + 2\sqrt{\frac{f_i K_x (g\alpha^2 - \gamma K_x)}{f_c \gamma}} \leq P_x < \left(2\frac{f_i}{f_c} + 1\right) K_x$ and $\gamma > 0$, provides neither benefits $G = 0$ nor deterrence $F_c > 0$ when $P_x < K_x + 2\sqrt{\frac{f_i K_x (g\alpha^2 - \gamma K_x)}{f_c \gamma}}$, and represses causing $G = 0$ when $\gamma = 0$.

Proof:

The proof is as for Theorem 1.

Figure B1 illustrates Theorem 2 dependent on the rent P_x when $\gamma > 0$.

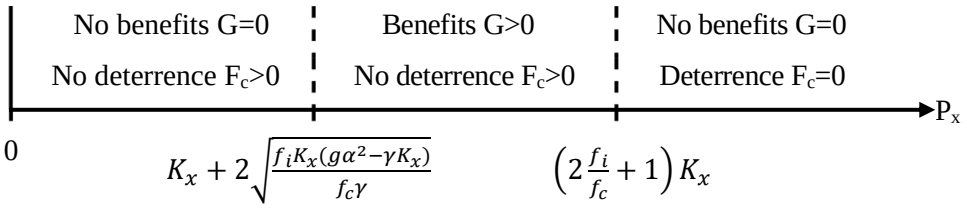


Figure B1: Illustration of Theorem 2 when $\gamma > 0$.

Theorem 3 Detail

No benefits provision G=0, challenger fighting $F_c > 0$, and incumbent fighting $F_i > 0$. In equilibrium, if $\gamma = 0$ and $P_x < \left(2\frac{f_i}{f_c} + 1\right) K_x$, or $\gamma > 0$ and $P_x < Min\left\{K_x + 2\sqrt{\frac{f_i K_x (g\alpha^2 - \gamma K_x)}{f_c \gamma}}, \left(2\frac{f_i}{f_c} + 1\right) K_x\right\}$,

then $\frac{\partial F_i}{\partial \alpha} > 0, \frac{\partial U_i}{\partial \alpha} > 0 \; if \; K_x < \frac{f_c P_x}{f_c + f_i}$,

$\frac{\partial U_i}{\partial \alpha} > 0, \frac{\partial F_i}{\partial P_x} > 0, \frac{\partial F_c}{\partial P_x} < 0 \; if \; K_x < \frac{f_c P_x}{f_c + f_i}, \frac{\partial F_i}{\partial K_x} < 0, \frac{\partial F_c}{\partial K_x} > 0 \; if \; K_x^2 < \frac{f_c P_x^2}{f_c + 2f_i}, \frac{\partial F_i}{\partial f_i} < 0,$

$\frac{\partial F_c}{\partial f_i} > 0 \; if \; K_x < \frac{f_c P_x}{f_i + f_c}, \frac{\partial F_i}{\partial f_c} > 0, \frac{\partial F_c}{\partial f_c} < 0$.

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Proof:

Differentiating (6) when γ=0 and $P_x < \left(2\frac{f_i}{f_c}+1\right)K_x$, or γ>0

and $P_x < Min\left\{K_x + 2\sqrt{\frac{f_i K_x(g\alpha^2-\gamma K_x)}{f_c\gamma}}, \left(2\frac{f_i}{f_c}+1\right)K_x\right\}$, gives

$$\frac{\partial F_i}{\partial \alpha} = \frac{f_c(P_x-K_x)^2}{4f_i^2K_x\alpha^2}, \quad \frac{\partial F_c}{\partial \alpha} = \frac{(2f_iK_x - f_c(P_x-K_x))(P_x-K_x)}{4f_i^2K_x\alpha^2}, \frac{\partial p}{\partial \alpha} = \frac{-1}{\alpha^2},$$

$$\frac{\partial U_i}{\partial \alpha} = \frac{4f_iK_x^2 + f_c(P_x-K_x)^2}{4f_iK_x\alpha^2}, \quad \frac{\partial U_c}{\partial \alpha} = \frac{(f_c^2P_x - (f_c+2f_i)^2K_x)(P_x-K_x)}{4f_i^2K_x\alpha^2},$$

$$\frac{\partial F_i}{\partial P_x} = \frac{f_c(P_x-K_x)(\alpha-1)}{2f_i^2K_x\alpha}, \quad \frac{\partial F_c}{\partial P_x} = \frac{-(f_cP_x - (f_c+f_i)K_x)(\alpha-1)}{2f_i^2K_x\alpha}, \frac{\partial p}{\partial P_x} = 0,$$

$$\frac{\partial U_i}{\partial P_x} = \frac{f_c(P_x-K_x)(\alpha-1)}{2f_iK_x\alpha}, \quad \frac{\partial U_c}{\partial P_x} = \frac{2f_i^2K_x + f_c(f_c(P_x-K_x) - 2f_iK_x)(\alpha-1)}{2f_i^2K_x\alpha},$$

$$\frac{\partial F_i}{\partial K_x} = \frac{-f_c(P_x-K_x)(P_x+K_x)(\alpha-1)}{4f_i^2K_x^2\alpha}, \quad \frac{\partial F_c}{\partial K_x} = \frac{(f_cP_x^2 - (f_c+2f_i)K_x^2)}{4f_i^2K_x^2\alpha}, \frac{\partial p}{\partial K_x} = 0,$$

$$\frac{\partial U_i}{\partial K_x} = \frac{-(f_cP_x^2 - (f_c+4f_i)K_x^2)(\alpha-1)}{4f_iK_x^2\alpha}, \quad \frac{\partial U_c}{\partial K_x} = \frac{-(f_c^2P_x^2 - (f_c+2f_i)^2K_x^2)(\alpha-1)}{4f_i^2K_x^2\alpha},$$

$$\frac{\partial F_i}{\partial f_i} = \frac{-f_c(P_x-K_x)^2(\alpha-1)}{2f_i^3K_x\alpha}, \quad \frac{\partial F_c}{\partial f_i} = \frac{(f_cP_x - (f_i+f_c)K_x)(P_x-K_x)(\alpha-1)}{2f_i^3K_x\alpha}, \frac{\partial p}{\partial f_i} = 0,$$

$$\frac{\partial U_i}{\partial f_i} = \frac{-f_c(P_x-K_x)^2(\alpha-1)}{4f_i^2K_x\alpha}, \quad \frac{\partial U_c}{\partial f_i} = \frac{-f_c(f_c(P_x-K_x) - 2f_iK_x)(P_x-K_x)(\alpha-1)}{2f_i^3K_x\alpha},$$

$$\frac{\partial F_i}{\partial f_c} = \frac{(P_x-K_x)^2(\alpha-1)}{4f_i^2K_x\alpha}, \quad \frac{\partial F_c}{\partial f_c} = \frac{-(P_x-K_x)^2(\alpha-1)}{4f_i^2K_x\alpha}, \frac{\partial p}{\partial f_c} = 0, \quad \frac{\partial U_i}{\partial f_c} = \frac{(P_x-K_x)^2(\alpha-1)}{4f_iK_x\alpha},$$

$$\frac{\partial U_c}{\partial f_c} = \frac{(f_c(P_x-K_x) - 2f_iK_x)(P_x-K_x)(\alpha-1)}{2f_i^2K_x\alpha} \tag{12}$$

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Theorem 4 Detail

No benefits provision G=0, no challenger fighting F_c=0, and incumbent fighting F_i >0. In equilibrium, if γ=0 and $P_x \geq \left(2\frac{f_i}{f_c}+1\right)K_x \frac{\partial F_i}{\partial f_c} < 0$, then $\frac{\partial F_i}{\partial \alpha} > 0, \frac{\partial U_i}{\partial \alpha} > 0 \; if \; K_x < \frac{f_c P_x}{f_i}, \frac{\partial F_i}{\partial P_x} = 0, \frac{\partial F_i}{\partial K_x} > 0, \frac{\partial F_i}{\partial f_i} = 0, \frac{\partial F_i}{\partial f_c} < 0.$

Proof:

Differentiating (6) when γ=0 and $P_x \geq \left(2\frac{f_i}{f_c}+1\right)K_x$ gives

$$\frac{\partial F_i}{\partial \alpha} = \frac{K_x}{f_c \alpha^2}, \frac{\partial p}{\partial \alpha} = \frac{-1}{\alpha^2}, \frac{\partial U_i}{\partial \alpha} = \frac{f_c P_x - f_i K_x}{f_c \alpha^2}, \frac{\partial U_c}{\partial \alpha} = \frac{-P_x}{\alpha^2}, \frac{\partial F_i}{\partial P_x} = \frac{\partial p}{\partial P_x} = 0, \frac{\partial U_i}{\partial P_x} = \frac{\alpha - 1}{\alpha}, \frac{\partial U_c}{\partial P_x} = \frac{1}{\alpha},$$

$$\frac{\partial F_i}{\partial K_x} = \frac{\alpha - 1}{f_c \alpha}, \frac{\partial p}{\partial K_x} = 0, \frac{\partial U_i}{\partial K_x} = \frac{-f_i(\alpha - 1)}{f_c \alpha}, \frac{\partial U_c}{\partial K_x} = 0, \frac{\partial F_i}{\partial f_i} = \frac{\partial p}{\partial f_i} = \frac{\partial U_c}{\partial f_i} = 0, \frac{\partial U_i}{\partial f_i} = \frac{-K_x(\alpha - 1)}{f_c \alpha}, \quad (13)$$

$$\frac{\partial F_i}{\partial f_c} = \frac{-K_x(\alpha - 1)}{f_c^2 \alpha}, \frac{\partial p}{\partial f_c} = \frac{\partial U_c}{\partial f_c} = 0, \frac{\partial U_i}{\partial f_c} = \frac{f_i K_x(\alpha - 1)}{f_c^2 \alpha}$$

Theorem 5 Detail

Benefits provision G>0, challenger fighting F_c>0, and incumbent fighting F_i >0:

Define $Q \equiv \sqrt{f_c(P_x - K_x)^2 + 4 f_i K_x^2}$ and $R \equiv \sqrt{f_i g K_x}$. In equilibrium, if γ>0 and $K_x + 2\sqrt{\frac{f_i K_x(g\alpha^2 - \gamma K_x)}{f_c \gamma}} \leq P_x < \left(2\frac{f_i}{f_c}+1\right)K_x$,

then

$$\frac{\partial G}{\partial \gamma} > 0 \; if \alpha > \frac{Q\sqrt{\gamma}}{4R}, \frac{\partial F_i}{\partial \gamma} > 0,$$

$$\frac{\partial F_c}{\partial \gamma} < 0 \; if \; \frac{f_c P_x}{2f_i + f_c} > K_x, \frac{\partial p}{\partial \gamma} > 0, \frac{\partial G}{\partial \alpha} < 0, \frac{\partial F_i}{\partial \alpha} = \frac{\partial F_c}{\partial \alpha} = \frac{\partial p}{\partial \alpha} = 0, \frac{\partial G}{\partial P_x} > 0,$$

$$\frac{\partial F_i}{\partial P_x} > 0 \; if \; \frac{1}{f_i^2 K_x} > \frac{g^2 K_x(8 f_i K_x^2 + f_c(P_x - K_x)^2)}{Q^3 R^3 \sqrt{\gamma}},$$

$$\frac{\partial F_c}{\partial P_x} > 0 \; if \; \frac{1}{f_i} > \frac{f_c(P_x - K_x)}{f_i^2 K_x} + \frac{K_x(8K_x(P_x + K_x)R^4 - g^2 Q^4)}{(P_x - K_x)Q^3 R^3 \sqrt{\gamma}}, \frac{\partial p}{\partial P_x} < 0,$$

$$\frac{\partial G}{\partial K_x} < 0 \; if \; K_x^2 < \frac{f_c P_x^2}{4f_i + f_c}, \frac{\partial p}{\partial K_x} > 0 \; if \; K_x^2 < \frac{f_c P_x^2}{4f_i + f_c}, \frac{\partial G}{\partial f_i} < 0, \frac{\partial p}{\partial f_i} > 0, \frac{\partial G}{\partial f_c} > 0, \frac{\partial p}{\partial f_c} < 0$$

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

Proof:

Define $V \equiv f_i g(P_x + K_x)$. Differentiating (6) when $\gamma>0$ and $K_x + 2\sqrt{\frac{f_i K_x(g\alpha^2-\gamma K_x)}{f_c \gamma}} \leq P_x < \left(2\frac{f_i}{f_c}+1\right)K_x$ gives

$$\frac{\partial G}{\partial \gamma} = \frac{-Q}{4R\gamma^{3/2}} + \frac{\alpha}{\gamma^2}, \frac{\partial F_i}{\partial \gamma} = \frac{f_c g^2 K_x (P_x - K_x)^2}{4QR^3\gamma^{3/2}}, \frac{\partial F_c}{\partial \gamma} = \frac{-g^2 K_x (f_c(P_x - K_x) - 2f_i K_x)(P_x - K_x)}{4QR\gamma^{3/2}},$$

$$\frac{\partial p}{\partial \gamma} = \frac{R}{Q\gamma^{3/2}}, \frac{\partial U_i}{\partial \gamma} = \frac{g\left(\sqrt{\gamma}\frac{Q}{R} - 2\alpha\right)}{2\gamma^2}, \frac{\partial U_c}{\partial \gamma} = \frac{g^2 K_x (f_c^2 P_x - (f_c + 2f_i)^2 K_x)(P_x - K_x)}{4QR\gamma^{3/2}},$$

$$\frac{\partial G}{\partial \alpha} = \frac{-1}{\gamma}, \frac{\partial F_i}{\partial \alpha} = \frac{\partial F_c}{\partial \alpha} = \frac{\partial p}{\partial \alpha} = \frac{\partial U_c}{\partial \alpha} = 0, \frac{\partial U_i}{\partial \alpha} = \frac{g}{\gamma},$$

$$\frac{\partial G}{\partial P_x} = \frac{f_c(P_x - K_x)}{2QR\sqrt{\gamma}}, \frac{\partial F_i}{\partial P_x} = \frac{f_c(P_x - K_x)}{2}\left(\frac{1}{f_i^2 K_x} - \frac{g^2 K_x (8f_i K_x^2 + f_c(P_x - K_x)^2)}{Q^3 R^3 \sqrt{\gamma}}\right),$$

$$\frac{\partial F_c}{\partial P_x} = \frac{1}{2}\left(\frac{1}{f_i} - \frac{f_c(P_x - K_x)}{f_i^2 K_x} - \frac{K_x(8K_x(P_x + K_x)R^4 - g^2 Q^4)}{(P_x - K_x)Q^3 R^3 \sqrt{\gamma}}\right), \frac{\partial p}{\partial P_x} = \frac{-2f_c(P_x - K_x)R}{Q^3\sqrt{\gamma}},$$

$$\frac{\partial U_i}{\partial P_x} = \frac{f_c(P_x - K_x)(Q\sqrt{\gamma} - 2R)}{2f_i K_x Q\sqrt{\gamma}},$$

$$\frac{\partial U_c}{\partial P_x} = \left(16f_i^3 K_x^3 R + f_c^3 (P_x - K_x)^3 (Q\sqrt{\gamma} - R) + 8f_c f_i^2 K_x^3 (2R - Q\sqrt{\gamma})\right.$$
$$\left. -2f_c^2 f_i K_x (P_x - K_x)[4K_x R + (P_x - 3K_x)Q\sqrt{\gamma}]\right) \Big/ 2f_i^2 K_x Q^3 \sqrt{\gamma} \quad (14)$$

$$\frac{\partial G}{\partial K_x} = \frac{-f_i g(f_c P_x^2 - (4f_i + f_c)K_x^2)}{4QR^3\sqrt{\gamma}},$$

$$\frac{\partial F_i}{\partial K_x} = \frac{f_c(P_x - K_x)(f_c(P_x - K_x)^2(P_x + K_x)R(R - Q\sqrt{\gamma}) + 4f_i K_x^2[K_x + 3P_x - (P_x + K_x)Q\sqrt{\gamma}])}{4f_i^2 K_x^2 Q^3\sqrt{\gamma}},$$

$$\frac{\partial F_c}{\partial K_x} = \left(f_c^2(P_x - K_x)^3(P_x + K_x)R(Q\sqrt{\gamma} - R) + 8f_i^2 K_x^4 (V - QR\sqrt{\gamma})\right.$$
$$\left. +2f_c f_i K_x^2 (P_x - K_x)(3K_x + P_x)(QR\sqrt{\gamma} - V)\right) \Big/ 4f_i^2 K_x^2 Q^3 R\sqrt{\gamma},$$

$$\frac{\partial p}{\partial K_x} = \frac{f_i g(f_c P_x^2 - (4f_i + f_c)K_x^2)}{R\sqrt{\gamma}Q^3}, \frac{\partial U_i}{\partial K_x} = \frac{f_i g^2 (f_c P_x^2 - (4f_i + f_c)K_x^2)R(2R - \sqrt{\gamma}Q)}{4R^5\sqrt{\gamma}Q},$$

$$\frac{\partial U_c}{\partial K_x} = \left(f_c^3(P_x - K_x)^3(P_x + K_x)R(R - Q\sqrt{\gamma}) - 16f_i^3 K_x^4 (V - QR\sqrt{\gamma})\right.$$
$$+4f_c^2 f_i K_x^2 (P_x - K_x)\left[f_i g(2K_x^2 + K_x P_x + P_x^2) - 2K_x QR\sqrt{\gamma}\right]$$
$$\left. +4f_c f_i^2 K_x^2 [f_i g(-5K_x^3 - K_x^2 P_x - 3K_x P_x^2 + P_x^3) + (5K_x^2 - 2K_x P_x + P_x^2)QR\sqrt{\gamma}]\right) \Big/ 4f_i^2 K_x^2 Q^3 R\sqrt{\gamma} \quad (15)$$

Vol. 15, No. 1 (2020) | doi:10.15355/epsj.15.1.58

$$\frac{\partial G}{\partial f_i}=\frac{-f_c g K_x(P_x-K_x)^2}{4R^3\sqrt{\gamma}Q},\frac{\partial F_i}{\partial f_i}$$
$$=\frac{f_c g(P_x-K_x)^2(f_c(P_x-K_x)^2(3R-2Q\sqrt{\gamma})+8f_iK_x^2(2R-Q\sqrt{\gamma}))}{4f_i^2Q^3R^2\sqrt{\gamma}},$$
$$\frac{\partial F_c}{\partial f_i}=g(P_x-K_x)\big(\big[16f_i^2K_x^3+3f_c^2(K_x-P_x)^3+2f_cf_iK_x(K_x-P_x)(9K_x-P_x)\big]R$$
$$+2[4f_iK_x^2+f_c(K_x-P_x)^2][f_cP_x-(f_c+f_i)K_x]Q\sqrt{\gamma})$$
$$\frac{}{4f_i^2Q^3R^2\sqrt{\gamma}},$$
$$\frac{\partial p}{\partial f_i}=\frac{f_c g K_x(P_x-K_x)^2}{R\sqrt{\gamma}Q^3},\frac{\partial U_i}{\partial f_i}=\frac{f_c g^2K_x(P_x-K_x)^2R(2R-\sqrt{\gamma}Q)}{4R^5\sqrt{\gamma}Q},$$
$$\frac{\partial U_c}{\partial f_i}=f_c g(K_x-P_x)\big(f_c^2(K_x-P_x)^3R(3R-2Q\sqrt{\gamma})+4f_cf_iK_x(K_x-P_x)R$$
$$\times\big[(5K_x-P_x)R+(-3K_x+P_x)Q\sqrt{\gamma}\big]$$
(16) $$+4f_i^2K_x^2[f_ig(7K_x^2+2K_xP_x-P_x^2)-4K_xQR\sqrt{\gamma}]\big)$$
$$\frac{}{4f_i^2Q^3R^3\sqrt{\gamma}}$$
$$\frac{\partial G}{\partial f_c}=\frac{(P_x-K_x)^2}{4R\sqrt{\gamma}Q},\frac{\partial F_i}{\partial f_c}=\frac{(P_x-K_x)^2-\frac{(-16f_i^2K_x^4+Q^4)R}{f_cQ^3\sqrt{\gamma}}}{4f_i^2K_x},$$
$$\frac{\partial F_c}{\partial f_c}=\frac{(P_x-K_x)^2(f_c(P_x-K_x)^2(R-Q\sqrt{\gamma})+2f_iK_x(3K_xR+P_xR-2K_xQ\sqrt{\gamma}))}{4f_i^2K_xQ^3\sqrt{\gamma}},$$
$$\frac{\partial p}{\partial f_c}=\frac{-R(P_x-K_x)^2}{4\sqrt{\gamma}Q^3},\frac{\partial U_i}{\partial f_c}=\frac{(P_x-K_x)^2(\sqrt{\gamma}Q-2R)}{4f_iK_x\sqrt{\gamma}Q},$$
$$\frac{\partial U_c}{\partial f_c}=(K_x-P_x)\big(-\big[3f_c^2(K_x-P_x)^3+4f_i^2K_x(7K_x^2+2K_xP_x-P_x^2)$$
$$+4f_cf_iK_x(5K_x^2-6K_xP_x+P_x^2)]R$$
$$+2[2f_iK_x+f_c(K_x-P_x)][4f_iK_x^2+f_c(K_x-P_x)^2]Q\sqrt{\gamma})$$
$$\frac{}{4f_i^2K_xQ^3\sqrt{\gamma}}$$

Appendix C: Revolutions 1961-2011

Table C1: Revolutions 1961-2011

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	Years	*Revolution*	*O*	*FSI*	*α*	*GDP/c*	*γ*	F_i	F_c	*G*	*p*	*Ui*	U_c
1	1961-70	First Kurdish-Iraqi War	RP	109	2.202	245.032	4.778	0.148	0.148	0.051	0.409	0.688	0.966
2	1961	Algiers Putsch	RP	77.8	3.085	213.486	4.659	0.169	0.169	0.000	0.324	0.845	0.817
3	1961-91	Eritrean War of Independence*	RL	83.9	2.861	152.987	4.369	0.163	0.163	0.000	0.350	0.813	0.862
4	1961-75	Angola War of Independence*	RL	88.3	2.718	664.118	5.644	0.158	0.158	0.000	0.368	0.790	0.894
5	1961-90	Anti-Apartheid Movement	RL	55.7	4.309	444.896	5.297	0.192	0.192	0.000	0.232	0.960	0.656
6	1962-74	Independence of Guinea-Bissau and Cape Verde*	RL	85.4	2.810	110.608	4.088	0.161	0.161	0.000	0.356	0.805	0.873
7	1962	Revolution in Northern Yemen	RL	96.6	2.484	468.367	5.341	0.153	0.153	0.019	0.387	0.748	0.927
8	1962-75	Dhofar Rebellion (Oman)	RP	43.8	5.479	101.259	4.011	0.204	0.204	0.000	0.183	1.022	0.569
9	1963-69	Bale Revolt in Southern Ethiopia	RP	91.9	2.612	202.792	4.614	0.154	0.154	0.000	0.383	0.771	0.920
10	1964	Zanzibar Revolution (Tanzania)	AL	78.3	3.065	219.372	4.682	0.608	0.032	0.000	0.326	1.282	0.948
11	1964-79	Rhodesian Bush War / Zimbabwe War of Liberation*	RL	109	2.204	285.053	4.910	0.137	0.137	0.000	0.454	0.683	1.044
12	1964-75	Mozambican War of Independence	RL	74.8	3.209	297.619	4.947	0.172	0.172	0.000	0.312	0.860	0.795
13	1965	March Intifada (Bahrain)*	RL	84	2.857	8537.929	7.863	0.170	0.170	0.035	0.319	0.816	0.808
14	1965	Malawi	AL	89.8	2.673	56.535	3.505	0.565	0.030	0.000	0.374	1.191	1.087
15	1965	Zambia	AL	79.6	3.015	303.883	4.965	0.603	0.032	0.012	0.325	1.277	0.946
16	1966-88	Namibia Struggle for Independence*	RL	70.7	3.395	2391.787	6.757	0.176	0.176	0.000	0.295	0.882	0.766
17	1967-70	Biafra (Nigeria)	RP	94.4	2.542	99.407	3.995	0.152	0.152	0.000	0.393	0.758	0.938
18	1968	May 1968 in France	RP	34.3	6.997	2532.315	6.807	0.214	0.214	0.000	0.143	1.071	0.500
19	1968	Prague Spring (Czechoslovakia)	RP	45.9	5.234	2392.730	6.758	0.202	0.202	0.000	0.191	1.011	0.584
20	1969-98	The Troubles (Northern Ireland)	RC	18.6	12.903	1291.350	6.222	0.231	0.231	0.000	0.078	1.153	0.386
21	1970-71	Black September (Jordan)	RP	77	3.117	372.094	5.141	0.170	0.170	0.000	0.321	0.849	0.811
22	1971	Bangladesh Liberation War**	RL	96.3	2.492	131.756	4.240	0.150	0.150	0.000	0.401	0.748	0.952
23	1974	Revolution in Ethiopia	RL	91.9	2.612	202.792	4.614	0.154	0.154	0.000	0.383	0.771	0.920
24	1975-91	Western Sahara War**	RL	82.2	2.921	430.366	5.268	0.164	0.164	0.000	0.342	0.822	0.849
25	1975-90	Lebanese Civil War	RP	80.5	2.981	1241.684	6.188	0.166	0.166	0.000	0.335	0.831	0.837
26	1975-02	Angola Civil War	RL	88.3	2.718	664.118	5.644	0.158	0.158	0.000	0.368	0.790	0.894
27	1977-92	Mozambican Civil War	RC	74.8	3.209	297.619	4.947	0.172	0.172	0.000	0.312	0.860	0.795
28	1978	Saur Revolution (Afghanistan)	RL	99.8	2.405	249.287	4.793	0.148	0.148	0.009	0.409	0.730	0.965
29	1978	Kurdish-Turkish Conflict	RP	74.4	3.226	1549.646	6.380	0.173	0.173	0.000	0.310	0.863	0.793

ISSN 1749-852X

	1	2	3	4	5	6	7	8	9	10	11	12	13
	Years	*Revolution*	*O*	*FSI*	α	*GDP/c*	γ	F_i	F_c	*G*	*p*	*Ui*	U_c
30	1979	New Jewel Movement (Grenada)	AL	34.2	7.018	7804.762	7.785	0.774	0.041	0.000	0.143	1.631	0.415
31	1979	Iranian Revolution	RL	84	2.857	2426.454	6.770	0.164	0.164	0.008	0.344	0.813	0.852
32	1980	Coconut War (Republic of Vanuatu)	RP	84.6	2.837	770.466	5.774	0.162	0.162	0.000	0.353	0.809	0.867
33	1970-80	Zimbabwe	RL	109	2.204	364.054	5.122	0.137	0.137	0.000	0.454	0.683	1.044
34	1983-05	Second Sudanese Civil War**	RL	112	2.137	386.786	5.175	0.133	0.133	0.000	0.468	0.665	1.069
35	1986	People Power Revolution (Philippines)	AL	79.2	3.030	535.236	5.457	0.605	0.032	0.035	0.310	1.295	0.903
36	1987-91	First Intifada (Palestine)	RP	79.4	3.023	1201.582	6.160	0.167	0.167	0.000	0.331	0.836	0.829
37	1987	Singing Revolution (Estonia/Latvia/Lithuania)	RL	52.3	4.589	2514.150	6.801	0.196	0.196	0.000	0.218	0.978	0.631
38	1988	8888 Uprising (Burma / Myanmar)	RL	96.5	2.487	100.527	4.005	0.149	0.149	0.000	0.402	0.747	0.954
39	1989	Caracazo (Venezuela)	RP	81.2	2.956	2244.970	6.702	0.165	0.165	0.000	0.338	0.827	0.842
40	1989	Tiananmen Square Protests (China)	RL	82.5	2.909	310.882	4.985	0.164	0.164	0.000	0.344	0.820	0.852
41	1989	Velvet Revolution (Czechoslovakia)	RL	45.9	5.234	3130.910	6.991	0.202	0.202	0.000	0.191	1.011	0.584
42	1989	Peaceful Revolution (East Germany)	RL	39.7	6.045	17697.164	8.496	0.209	0.209	0.000	0.165	1.043	0.539
43	1989	Roman Revolution	RL	62.6	3.834	1817.902	6.519	0.185	0.185	0.000	0.261	0.924	0.706
44	1989	Hungary	RL	46.7	5.139	3349.770	7.050	0.201	0.201	0.000	0.195	1.007	0.591
45	1990	Poland	AL	47.9	5.010	2908.800	6.927	0.722	0.038	0.000	0.200	1.523	0.581
46	1990	Riots in Zambia	RL	79.6	3.015	409.258	5.224	0.167	0.167	0.000	0.332	0.835	0.830
47	1990-95	Log Revolution (Republic of Croatia)*	RL	61.9	3.877	4941.800	7.388	0.186	0.186	0.000	0.258	0.928	0.701
48	1990-95	First Touareg Rebellion in Mali and Niger	RP	80.8	2.970	313.202	4.992	0.166	0.166	0.000	0.337	0.829	0.839
49	1991	Shiite Uprising in Karbala (Iraq)	RP	109	2.202	10297.428	8.025	0.136	0.136	0.000	0.454	0.682	1.045
50	1991	Russia	AL	87.1	2.755	3485.056	7.084	0.599	0.032	0.129	0.272	1.312	0.795
51	1992-95	Bosnia War of Independence*	RL	88.5	2.712	318.020	5.005	0.158	0.158	0.000	0.369	0.789	0.895
52	1994	Zapatista Rebellion (Mexico)	RC	73.1	3.283	5715.410	7.514	0.174	0.174	0.000	0.305	0.869	0.783
53	1994-96	First Chechen War (Chechnya)*	RL	87.1	2.755	2663.395	6.851	0.165	0.165	0.025	0.342	0.798	0.848
54	1997-99	Rebellion in Albania	RL	68.6	3.499	717.380	5.711	0.179	0.179	0.000	0.286	0.893	0.750
55	1998	Kosovo Rebellion	RL	75.8	3.165	1675.910	6.449	0.171	0.171	0.000	0.316	0.855	0.803
56	1998	Bolivarian Rebellion (Venezuela)	AC	81.2	2.956	3874.982	7.177	0.601	0.032	0.103	0.271	1.342	0.790
57	1998	Indonesian Revolution	RL	89.2	2.691	463.969	5.333	0.157	0.157	0.000	0.372	0.785	0.900
58	1999-present	Second Chechen War (retake over by Russia)	RL	87.1	2.755	1330.751	6.248	0.161	0.161	0.006	0.358	0.796	0.876
59	2000-04	Second Intifada (Palestine)	RP	79.4	3.023	1476.172	6.338	0.167	0.167	0.000	0.331	0.836	0.829
60	2000	Bulldozer Revolution (Republic of Yugoslavia)	RL	69.2	3.467	2826.750	6.903	0.178	0.178	0.000	0.288	0.889	0.755

ISSN 1749-852X

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	Years	*Revolution*	*O*	*FSI*	*α*	*GDP/c*	*γ*	F_i	F_c	*G*	*p*	*Ui*	U_c
61	2001	Macedonia Conflict	RC	75.1	3.196	1815.920	6.518	0.172	0.172	0.000	0.313	0.859	0.798
62	2001	EDSA Revolution (Philippines)	RL	79.2	3.030	957.281	5.962	0.168	0.168	0.000	0.330	0.838	0.828
63	2001	Cacerolazo in Argentina	RL	40.8	5.882	7170.695	7.711	0.208	0.208	0.000	0.170	1.038	0.548
64	2003	Rose Revolution (Georgia)	RL	82.2	2.920	927.989	5.935	0.164	0.164	0.000	0.343	0.822	0.849
65	2003-present	Darfur Rebellion	RL	112	2.137	477.738	5.358	0.133	0.133	0.000	0.468	0.665	1.069
66	2004-05	Orange Revolution (Ukraine)	RL	72.9	3.292	1367.352	6.272	0.174	0.174	0.000	0.304	0.870	0.782
67	2005	Cedar Revolution (Lebanon)	RL	80.5	2.981	5390.208	7.463	0.168	0.168	0.010	0.327	0.831	0.823
68	2005	Tulip Revolution (Kyrgyzstan)	RL	90.3	2.658	476.552	5.356	0.156	0.156	0.000	0.376	0.780	0.908
69	2007-09	Tuareg Rebellion (Mali and Niger)	RP	83.4	2.879	444.098	5.295	0.163	0.163	0.000	0.347	0.816	0.858
70	2009	Malagasy Political Crisis (Madagascar)	RL	81.6	2.941	415.689	5.238	0.165	0.165	0.000	0.340	0.825	0.845
71	2010	Thai Political Protests (Thailand)	RP	78.8	3.046	5075.302	7.411	0.168	0.168	0.000	0.328	0.840	0.825
72	2010	Kyrgyzstani Revolution	RL	88.4	2.715	880.038	5.889	0.158	0.158	0.000	0.368	0.790	0.895
73	2010-	Arab Spring, Tunisia	RL	67.5	3.556	4140.152	7.234	0.180	0.180	0.000	0.281	0.898	0.742
74	2010-	Arab Spring, Algeria	RP	81.3	2.952	4463.395	7.299	0.167	0.167	0.009	0.331	0.827	0.829
75	2011-	Arab Spring, Jordan	RC	74.5	3.221	3807.324	7.161	0.172	0.172	0.000	0.310	0.862	0.793
76	2011-	Arab Spring, Mauritania	RP	88	2.727	1389.671	6.286	0.161	0.161	0.012	0.357	0.792	0.874
77	2011-	Arab Spring, Oman	RC	49.3	4.868	20986.085	8.644	0.199	0.199	0.000	0.205	0.993	0.609
78	2011-	Arab Spring, Saudi Arabia	RC	75.2	3.191	23770.747	8.752	0.174	0.174	0.013	0.302	0.859	0.779
79	2011-	Arab Spring, Egypt	RL	86.8	2.765	2747.480	6.878	0.165	0.165	0.024	0.341	0.799	0.847
80	2011-	Arab Spring, Yemen	RL	100	2.393	1349.420	6.260	0.146	0.146	0.000	0.418	0.728	0.981
81	2011-	Arab Spring, Iraq	RC	105	2.290	5854.614	7.535	0.141	0.141	0.000	0.437	0.704	1.014
82	2011-	Arab Spring, Bahrain	RC	59	4.068	22512.160	8.705	0.189	0.189	0.000	0.246	0.943	0.680
83	2011-	Arab Spring, Libya	RL	68.7	3.493	5602.549	7.497	0.178	0.178	0.000	0.286	0.892	0.751
84	2011-	Arab Spring, Kuwait	RC	59.5	4.034	48268.591	9.367	0.188	0.188	0.000	0.248	0.940	0.684
85	2011-	Arab Spring, Morocco	RC	76.3	3.145	3039.916	6.966	0.171	0.171	0.000	0.318	0.853	0.806
86	2011-	Arab Spring, Syria	RC	85.9	2.794	3292.240	7.035	0.166	0.166	0.024	0.337	0.804	0.840
87	2011-	Arab Spring, Lebanon	RP	87.7	2.737	8734.189	7.882	0.159	0.159	0.000	0.365	0.793	0.889

* Liberation Movement—liberation from outside powers, ** Liberation Movement—Resulting in secession and new state. Source: African Development Bank Statistics Department.

Notes: Column 3 header *O* means outcome using the acronym from Figure 1, i.e., incumbent wins and remains in power (RP), incumbent loses causing standoff (RS), incumbent loses causing coalition (RC), challenger becomes new incumbent (RL), incumbent wins and remains in power (AP), Incumbent loses causing standoff, (AS), Incumbent loses causing coalition (AC), and Challenger becomes new incumbent (AL). Column 4 header FSI means Fragile States Index, and column 5 header GDP/c means Gross Domestic Product per capita. Columns 7 to 13 header abbreviations are defined in Appendix A.

ISSN 1749-852X

https://www.EPSJournal.org.uk
For permissions, email: ManagingEditor@EPSJournal.org.uk

THE ECONOMICS OF PEACE AND SECURITY JOURNAL

A journal of Economists for Peace and Security

VOL. 15, NO. 1 (2020)

ARTICLE