

# Chapter 1

## Introduction and Overview

*Stephen Martin  
Centre for Defence Economics,  
University of York, UK*

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### 1.1 Context

Defence procurement can take a number of forms. From indigenous projects, through shared development and production, licensed production and offsets, to an off-the-shelf purchase of a foreign design. Each form of procurement offers the purchaser a different degree of industrial involvement with the development and production of the system being acquired. At one end of the spectrum lie off-the-shelf purchases of a foreign system: these yield neither development nor production work for the domestic defence industrial base (DIB). At the other extreme lies indigenous development and production where all work is allocated to domestic firms. Between these two extremes are procurement options where work is shared between vendor and purchaser.

When purchasing defence equipment, vote-sensitive governments face some difficult choices. Indigenous development and production will, theoretically, provide an independent capability, the required equipment, as well as the most benefit for the domestic economy in terms of jobs and technology acquisition. However, this is also likely to be the most expensive option. An off-the-shelf purchase might involve compromise over the system's capability and will generate little domestic economic benefit. Moreover, there is always the risk that a vendor will not be willing/able to deliver further supplies as and when these are required. Yet this is likely to be the cheapest procurement option.

The ever-increasing costliness of defence equipment, limited defence budgets, as well as concerns about unemployment levels and the competitiveness of domestic industry, have all encouraged many states to eschew both indigenous development and off-the-shelf purchases. Instead, governments have favoured procurement forms which yield benefits for the domestic economy as well as being less costly than an indigenous programme. One option, which has been pursued by the larger Western European nations, has been to collaborate in the development and production of new equipment.<sup>1</sup> This has been particularly common for aerospace products, such as aircraft and missiles, where collaboration, by eliminating the duplication of costly R&D, can offer substantial savings over an indigenous programme.<sup>2</sup>

For some products, collaboration is not possible (e.g. where no other state has a similar requirement) or is considered too costly relative to the usually much cheaper off-the-shelf import option. However, imports typically bring few industrial benefits to the purchaser's economy. As a compromise, many countries have sought other procurement methods which ensure that each major defence procurement contract placed with a foreign supplier also provides substantial industrial benefits for the purchasing nation. These benefits are often discussed under the umbrella term 'offsets'. To the uninitiated, this can be confusing because the term 'offset' is also used to describe one particular form of industrial benefit. In this book, the broad definition of offset is adopted and this is taken to include the following forms of industrial benefit: co-production, licensed production, direct offset and indirect offset.

Licensed production occurs where the purchaser obtains a share of the production work for its own order and, sometimes, for its own exports to third parties. The licence may cover the manufacture of the entire item or only specified parts. Sometimes the licence only covers final assembly. Both Italy (Agusta) and the UK (Westland) have frequently purchased licences to produce American-designed helicopters.

Similar to licensed production is co-production, where the nation buying a foreign design is given a share in manufacturing work for its own order, the designer's order, and orders from third parties. For example, the General Dynamics F-16 European co-production contract in 1975 was based on sharing the manufacture of a 998 aircraft programme. The European consortium, which ordered 348 aircraft, was allocated work on the following basis: ten per cent of the initial US order (650 aircraft), forty per cent of their own order and fifteen per cent of export sales to other countries. Exports were estimated at 500 units and achievement of this figure would have meant that the Europeans would have obtained manufacturing business to the value of 80 per cent of their total order, namely 279 aircraft.<sup>3</sup>

While both co-production and licensed production provide employment and technological benefits for the domestic economy, the establishment of an indigenous production line is a costly business. As defence budgets have been cut and unemployment has risen, purchasers have sought a less costly form of procurement which still generates work for the domestic economy. Typically, this obliges the foreign vendor and its sub-contractors to buy goods and services over and above what it would have bought from firms in the purchaser's economy. This offset is usually some percentage of the contract price and a time period is often set for its fulfilment. Restrictions are usually imposed on the type of goods eligible for inclusion towards the offset, and certain types of work (e.g.

R&D) might be weighted more heavily than other purchases (e.g. off-the-shelf purchases of manufactured goods). These offsets might be for items to go into the equipment that the purchasing state's defence ministry is buying, in which case they are known as direct offset, or for items totally unrelated to the actual equipment being purchased, which is termed indirect offset. If the industrial base in the country purchasing the equipment is relatively small and underdeveloped, there may be few goods that can be purchased and thus inward investment might constitute the major component of any offset programme (e.g. as in the recent Al Yamamah sale of military aircraft by British Aerospace to Saudi Arabia).

Drawing hard and fast boundaries around the forms of work-sharing is not always either useful or easy. For example, there are obvious similarities between the licensed production of an aircraft part which is to be included in the aircraft to be purchased, and the production of the same part which is eligible towards a vendor's (direct) offset obligation: in both cases the work is placed with the domestic manufacturer. There are, of course, also differences: the direct offset implies that domestic manufacturer already had access to the necessary technology whereas licensed production implies the transfer of new technology to the manufacturer.

## 1.2 The Need for a Comparative Volume

All governments purchase defence equipment and it is, therefore, hardly surprising that over 130 countries have some form of offset policy.<sup>4</sup> Although commonplace, offset requirements vary considerably from one country to another (e.g. in terms of the type expenditure that is offset eligible). Moreover, states vary in terms of how long they have had an offset requirement and thus some policy differences will reflect their different experiences. Other policy differences will reflect different objectives (e.g. an emphasis on production or R&D work). This international diversity makes for an interesting comparative study.

Furthermore, as a specialism, economists have long neglected defence matters although the level of resources devoted to defence spending and indeed offsets is such as to warrant a substantially increased research effort. Certainly, there are very few economic evaluations of offset programs, not least because of the considerable problems associated with such an exercise. First, there is little, if any, routinely published data. Hence the analyst is reliant on the goodwill of those in industry and government to discuss such matters. Second, offsets are big business and are thus commercially sensitive. In an era of high unemployment, vote conscious governments are sensitive to the charge of spending large

amounts of tax-payers' money on products that generate few domestic jobs. One response to this is to cite the number of jobs created by offset work. Nevertheless, governments remain vulnerable to criticism of the efficacy of their offsets policy which is thus a politically sensitive issue. Third, those involved with offsets in both industry and government have vested interests. Consequently, it is sometimes difficult to disentangle fact from fiction. One of the advantages of a comparative volume is that, although the effect of offsets might be rather difficult to elucidate for any individual country, taken together, the experience of a number of states might more clearly reveal a number of common themes.

Finally, as defence budgets are cut and competition in the industry increases, offsets are likely to become more rather than less important. Firms will seek to compete for contracts by offering increasingly attractive offset packages and purchasers will increasingly demand domestic benefits for their defence expenditures. Thus a sound knowledge of the cost and impact of offsets becomes even more critical.

### 1.3 The Approach

The original aim of this volume was to provide an authoritative account of offset policy and experience across a representative cross-section of countries. The achievement of this objective was constrained by the availability of economists who were willing and able to write on offsets. However, an even more binding constraint proved to be the availability of appropriate information and, in particular, data on the cost and impact of offsets.

With regard to giving and receiving offset work, each country can be allocated to one of three groups. First, there is the USA that largely exports equipment and thus only gives offset. The chapter on this country examines the development of US offset policy over the past two decades. Second, there is the small number of states that both import and export armaments and thus who both give and receive offset work. France, Germany and the UK are three countries that fall into this category, two of which provide case studies for this book. Finally, there is the large number of states that largely import defence equipment and who thus typically only receive offset work.

The last group of countries offers a wide choice of case studies and an attempt has been made to select a representative sample in terms of geographical location, industrial base and defence policy. Four countries with a well-developed defence industry were selected: Australia, Belgium, Canada and Switzerland. Even within this group, however, there is a considerable diversity

of offset experience and policy. In Belgium and Canada, for example, there are strong regional issues so that the Federal government is as concerned with the geographical distribution as well as the level of offset work. Similarly, the group is far from homogenous in terms of defence policy. Canada can, for example, free-ride on the USA for its defence while Switzerland pursues a policy of independent neutrality.

Two other European states were selected, both with developing defence industries. Greece provides an interesting case study because the Turkish invasion of Cyprus in 1974 prompted a re-evaluation of the importance of its indigenous defence capabilities. Similarly, over the past two decades, Spain has been seeking to modernise its defence forces and both nations have attempted to use offsets to improve their defence industrial bases. In addition, both countries have made substantial defence purchases and their respective offset policies have changed markedly from one purchase to another. This suggests that their experience can offer useful insights into the operation and effectiveness of offset programmes.

From the Far East, three countries are studied: Japan, South Korea and Taiwan. All three are similar in the sense that their offset policy has emphasised technology transfer rather than merely production work. Consequently, their preferred offset option has been to licence produce US-designed aerospace products. However, this is a particularly costly option and one which the US government has become increasingly reluctant to permit for fears that its competitive advantage in aerospace will disappear as these transfers create new competitors in world markets.

From the Middle East there are chapters on Israel and Saudi Arabia. The Israeli chapter is unique in the sense that it is written by practitioners rather than academics. The authors work for *International Technology Sourcing (ITS)*, a US-based firm that specialises in identifying offset opportunities that are mutually beneficial to both the client country and the defence contractor. ITS has recently completed an offset campaign in Israel, and the authors discuss their experiences there. Three very large defence purchases over the past decade and a shift in offset policy make Saudi Arabia an interesting case study. In addition, the Saudi emphasis in its offset policy is not on providing work for domestic industry (which is very small) but rather on encouraging western companies to form joint ventures with Saudi partners to reduce the economy's dependence on oil. Like Japan, South Korea and Taiwan, the emphasis is on technology transfer but in the Saudi case this is neither focused on the aerospace industry nor does it involve the licensed production of the item being procured.

Obvious gaps in this study are the omission of any countries from either South America or Africa. These were areas where the availability of authors constraint bit particularly hard.

## 1.4 Overview

Chapter 2 provides a theoretical and empirical overview of offsets associated with both civil and military purchases. This should enable the reader to place each of the subsequent country studies within the wider context of reciprocal sales agreements as a whole.

Stefan Markowski and Peter Hall (Chapter 3) provide an interesting historical perspective on, and critical evaluation of, Australian offset policy. Their chapter also admirably demonstrates the terminological minefield that bedevils any international comparative discussion of offsets! As noted above, offset can either be used as an umbrella term for several forms of work-sharing or as a form of work-sharing in its own right. With regard to the latter usage, typically two forms of offset are distinguished, direct and indirect offset. In Australia, the term offset refers to indirect offset whilst the Australian equivalent of direct offset is known as ‘local content’ (which is not discussed). The authors argue that:

- (indirect) offsets are not costless;
- the purchaser should seek quotes for various levels of offset;
- the evidence suggests that (indirect) offsets have had limited success in either enhancing the DIB or improving the competitiveness of Australian firms in world markets.

Hence Markowski and Hall welcome the very recent policy changes whereby (indirect) offsets become a mechanism of “last resort”. However, this should not be interpreted as signalling the demise of offsets in Australia. For as indirect offset is being downplayed, local content (direct offset) “will have an increasing impact on programs, with the emphasis on the use of local prime contractors”.<sup>5</sup>

Jim Fergusson (Chapter 5) argues that, for the student of defence matters, Canada provides an interesting case study. Security considerations are notably absent from defence-industrial policy deliberations, not least because there is an implicit understanding that, if attacked, the US would defend its weaker neighbour, and so competition between industrial and economic benefits is to the fore. One consequence of this has been that offsets have served to improve Canada’s technological capability and unemployment record but at the cost of its military capability. Again, semantics are important. Officially, Canada does not have an offset policy but rather a requirement for industrial and regional benefits; in other words, offsets by another name. Unlike Australia, political issues in Canada frequently have a strong regional theme and thus the successful vendor will have ensured the appropriate regional distribution of offsets. However, industry is concentrated in central Canada and this makes it difficult to place

work with existing factories elsewhere. Moreover, the establishment of a new capability is costly and, without export markets, such capacity becomes dependent on domestic orders, thus constraining future procurement decisions. It is also interesting to note that both Canada and Australia have had a formal offset requirement for over two decades and that both have moved away from indirect and towards direct offset as their preferred policy.

Another country where regional considerations play an important role is Belgium. Like the Canadian case, this aspect of Belgian offset policy does not appear to be particularly successful in an industrial or economic sense but a political necessity. Wally Struys (Chapter 4) argues that overcapacity has been and remains one of the major problems facing the Belgian defence industry and that offsets, far from encouraging rationalisation, have served to keep inefficient producers in business and to create additional capacity albeit in industrially deprived regions. Struys argues that Belgian offsets have not been free goods and that their additional cost has reduced the purchasing power of the defence budget. Again, offsets help to maintain the defence industrial base but only in the short term. Firms become dependent on offset work, which constrains future procurement choices and masks industrial shortcomings. Struys argues that there is a need to integrate offsets into industrial development policy as a whole and to focus on sustainable long-term goals rather than more immediate short-term objectives.

Alon Redlich and Maison Miscavage (Chapter 15) provide a practitioner's viewpoint. They argue that offsets should be seen as an opportunity rather than a burden, and that with a co-operative rather than adversarial attitude, offsets can prove beneficial to both the client country and the defence contractor. In addition to their general remarks on offsets, which (reassuringly) are very much in line with those made by academics elsewhere in the book, the authors discuss their recent campaign in Israel and indicate how a company, such as ITS, identifies mutually beneficial offset opportunities. Like several other countries, Israeli offset policy encourages foreign and Israeli firms to establish very close, long-term working relationships in an attempt to improve global market access for domestic goods. Consequently, short-term, one-off deals play a very small role in the Israeli offset environment.

Much of the discussion of offsets is plagued by a lack of relevant information. Stephen Martin and Keith Hartley (Chapter 13) outline and discuss the results of two industrial surveys: one looks at incoming offset work while the other examines the impact of offsets associated with UK defence exports. These will be of interest as the survey responses provide a rare insight into the employment, technology and competitive impact of offsets. The studies suggest that although, financially, offsets involve considerable sums, in practical terms their

impact is, for the UK at least, much less significant. For example, the \$1.5bn offset associated with the UK's purchase of AWACS aircraft is thought to have generated 4804 person-years of work for UK industry while £450m of export offset 'cost' the UK 1105 employee-years of work. It is also interesting to note that the survey evidence suggests that offsets *do* cost more than an equivalent off-the-shelf purchase and, not surprisingly, that vendors seek to include most of this premium in the selling price. Once it is acknowledged that offsets are not free, it then seems sensible that the benefits associated with offset should be carefully documented. Offsets can be viewed as an instrument of industrial policy and whether this tool is the most cost-effective way to achieve policy objectives needs careful examination. At the time of writing, however, this is not the UK's approach, although elsewhere offsets are part of a wider industrial policy.

Abdullah Al-Ghrair and Nick Hooper (Chapter 9) argue that in Saudi Arabia offset policy can be viewed as an extension of its industrial policy. Offset is not about encouraging the vendor to purchase more domestically manufactured goods — the Saudi industrial base is simply too small to absorb the required amount of work. Instead, the objective is to reduce the economy's dependence on oil by encouraging the growth of other industrial sectors through the establishment of international joint ventures. These joint ventures typically comprise a Saudi partner, the firm that owns the relevant technology, and (often), the firm with the offset obligation. The latter typically contributes equity capital as well as knowledge of the type of ventures sought by the Saudi authorities and the personal contacts and local expertise necessary to facilitate the establishment of a new venture in the Kingdom. Most of these joint ventures are not in the defence field. This latter aspect of current policy is in marked contrast to the earliest developments associated with the Peace Shield offset. Here, Boeing established factories for the repair and maintenance of, *inter alia*, the AWACS aircraft, but these facilities were unable to secure sufficient additional work to justify their construction. The Saudi response to this was to continue to seek international joint ventures as a way of introducing new technologies into the economy but to move away from defence and into other sectors where demand is more substantial and the prospects for market growth more attractive. The emphasis is much more on offset as a means to long-term viability rather than as a short-term stop-gap to meet a deficiency of demand.

There can be few countries where offsets have made a greater contribution to economic and industrial development than Japan. Seeking control over its technological destiny, Japan required a local ability to research, innovate, design and manufacture. Hence offsets have taken the form of licensed production. These offsets have not been cheap but the Japanese government has been willing

to pay the necessary premium for the associated benefits such as stimulating local industry and improving the security of supply. Michael Chinworth and Ron Matthews (Chapter 9) argue that the US has been willing to transfer technologies and thus to risk the development of new competitors for several reasons. First, US firms receive substantial royalty payments. Second, such transfers improve the strength of an ally against any potential Soviet threat. Third, if the US did not grant the relevant licences, it is likely that the Japanese would turn to the Europeans and thus acquire similar technologies, but from US competitors. This policy has yielded a strong, technologically advanced, and increasingly self-reliant defence industrial base. Although Japan's defence budget is likely to be increasingly squeezed in the foreseeable future, and the defence environment has changed considerably, the commitment to domestic defence production and hence offset is likely to continue unabated.

Michael Chinworth and Dean Cheng (Chapter 10) argue that technology transfer has also driven offset demands in both South Korea and Taiwan. With the announcement of the Nixon doctrine in 1970 and the subsequent reduction of US forces from the Asian region, both countries sought to develop an indigenous defence industrial capacity which was seen as essential to guarantee their territorial integrity. Also, the increased sophistication of their defence industries was viewed as a way of injecting advanced technologies into the economy as a whole. For the US, arms sales with offsets served to strengthen diplomatic and military ties; this was particularly important after the Nixon doctrine when many in the region feared an imminent American withdrawal and the destabilising consequences that would follow. With the end of the Cold War, the US has become more concerned about the economic consequences of offsets and, in particular, fears that such packages contribute to the growth of potential competitors. The lessons of past technology transfers to Japan remain! However, the authors argue that both South Korea and Taiwan are unlikely to be able to exploit these transfers to the extent that Japan was able to do. First, because South Korea and Taiwan are attempting to develop their economies from a far lower technological level than that which faced Japan at the end of the Second World War and second, that this technological deficiency is exacerbated by human resource constraints. Moreover, Japan benefitted from a far more liberal trade and technology transfer environment than either South Korea or Taiwan, due partly to the Western experience with Japan. Consequently, even if offsets do transfer technologies it is unlikely that either economy will be able to exploit such transfers to the extent that Japan was able to do so.

Jordi Molas-Gallart (Chapter 11) looks at the development of Spanish offset policy over the past decade. The author examines the \$1.5bn offset, to be met over a ten-year period, associated with the purchase, in 1984, of 72 F-15 fighter

aircraft. The objective for the offset was to improve the industrial and technological base, particularly in the defence sector, and to increase the political acceptability of spending such a large sum on a foreign product when domestic unemployment levels were relatively high (20%). At the beginning of the 1980s Spain's NATO membership was still pending and thus she was absent from various major international arms co-operation fora. The author argues that it was only through the purchase of foreign defence equipment that Spain could attempt to upgrade the technological level of its defence industries. Particular emphasis was given to aerospace, materials, avionics and simulators. If placing work with Spanish firms was more expensive for McDonnell than using its usual suppliers, then the Spanish government was willing to pay for this and set aside \$100m for this purpose.

As McDonnell-Douglas' annual obligation grew, fulfilling the offset became more and more difficult. Molas-Gallart identifies several reasons for this. In principle, offsets could be in any area of technological development but this allowed the authorities to establish sectoral and regional priorities. McDonnell submitted hundreds of projects for offset approval and the authorities, as so often happens in other countries, were faced with the problem of deciding whether each proposal met the conditions required to be a genuine offset. Proposed transactions had to result in a net increase for Spanish exports to the US. Once a project was accepted, the Management Office then had the other familiar problem of calculating its "offset value", which involved, amongst other things, estimating the growth in normal trade flows that the new offset caused, and the associated Spanish value added. By the early 1990s, McDonnell-Douglas was finding it difficult to meet its annual obligations, not least because the global recession was making it increasingly difficult to find new markets for Spanish products.

According to Gallart, these problems with the F-18 offset prompted a shift in policy. Rather than seek offset, Spain sought direct participation in the development and production programme for the modernisation of its AV-8B Harriers. Although the amount of business generated is similar, joint development and production allows the tasks that Spanish industry will undertake to be defined in advance of any final procurement decisions whereas offsets are agreed after the procurement decision. Moreover, with joint development there is no need to oversee offset applications.

At the same time there has been a policy to use acquisition programmes to draw foreign partners into domestic companies. The idea here is that with an equity interest in the profitability of the Spanish partner, the foreign company will be more willing to share its technological and marketing skills. Moreover, with offset the vendor's interest in placing work with Spanish firms is likely to

decline once it has fulfilled its obligation. With an equity interest, however, it is hoped that this will lead foreign firms to take longer term view although there is of course nothing to stop them from selling their shareholding, although such investments might assist US manufacturers to win other (European) orders.

Spain is not the only country to move away from one form of offset and towards other forms of cooperation, particularly joint ventures. A similar trend is revealed in Nicholas Antonakis' paper (Chapter 7) on Greece. The Turkish invasion of Cyprus in 1974 and the continuing territorial disputes between the two countries, focused attention on the need to modernise Greece's defence as well as to improve the domestic defence capability to minimise Greece's foreign dependent and vulnerability in wartime. However, a formal offset package did not come into being until a decade later with the purchase of 40 Mirage 2000 aircraft from Dassault. For this offset, valued at some 80% of the purchase price, co-production and investment projects, technology transfers, the promotion of Greek exports as well as the development of tourism, were all acceptable for offset credit. Unfortunately, there is no publicly available information on the success or otherwise of this package.

However, the offset agreement which accompanied the purchase of 40 F-16C from the USA, signed almost three years later, was rather different. This led to the formation of the Greek Investment Development Company (GIDC), owned jointly by the Greek government and three US companies, General Dynamics, General Electric and Westinghouse. The GIDC will undertake investment projects, mainly for the production of high technology goods, it will ease and facilitate the transfer of technology to Greek firms and it will promote the export of Greek industrial products in new foreign markets. In addition, the offset is said to involve the co-production of air frame and engine parts to the value of \$100m. Similarly, two other major offset purchases — for four Meko-200 frigates and the upgrading of the Kanaris directional firing system on Harpoon missiles — focused on the Greek production of parts or the entire product, either for the equipment being purchased by the Greeks or for export to third parties.

As in the Spanish case, there seems to have been a move away from offsets from any part of the Greek economy and towards those directly associated with the equipment being purchased. And at the same time, the formation of the GIDC joint venture seems to parallel Spanish attempts to draw foreign firms into the domestic economy as a way gaining access to new technological, production and marketing skills.

Few studies outline in more detail the various forms that offset can take better than Jean-Paul Hébert's examination of French exports (Chapter 6). Hébert defines offset in a broad way and includes such transactions as barter, the

simultaneous counter-purchase of specific goods, the counter-purchase of unspecified industrial products and services to a specific value, technology transfers and the provision of favourable financial loans. Hébert argues that offsets have become an important competitive tool in the armaments market and cites several deals where the offset package proved decisive in the choice of which product to purchase. He concludes that as defence budgets are cut and suppliers chase fewer and smaller orders this aspect of the competitive process is likely to become more rather than less important.

Bernard Udis' case study of the Swiss F-5 purchase (Chapter 12) is an interesting one because it involves a number of issues which arise with many offsets. Previously, the Swiss had licensed produced foreign designs but by the 1970s this procurement method had become prohibitively expensive. Direct and indirect offsets offered the opportunity to buy the aircraft required and at the same time to compensate the defence industrial base for not licence producing the aircraft domestically. For both vendor and purchaser this was one of the early offsets of its type and, as might be expected, both sides were involved in a learning process. Swiss industry expected automatically to win contracts from US firms and found the administrative hurdles of selling to the US military difficult to overcome. The vendors, Northrop and General Electric, were finding it difficult to identify quickly Swiss firms with the necessary cost and quality characteristics. As is often the case with technologically advanced countries, the Swiss wanted the offset not so much to provide jobs or to improve the balance of payments, as to assist firms that would have received orders had the aircraft been produced in Switzerland. And as is often the case, there was the by now common debate concerning which sales occurred as a result of the offset and which reflected established business relations. Udis' chapter also sheds some light on other issues associated with offset. He notes that the US vendors continued to place work with Swiss firms after the obligation had been fulfilled although, as Udis notes, this was partly because such purchases could be banked as offset credit. Swiss industry is still producing parts for F-5s and Udis argues that technological spinoffs from the offset increased the possibility of Swiss participation in joint European projects. The Swiss recognise that there is a cost premium to pay for offsets but consider that a figure of up to 10 per cent is reasonable for a well-designed offset program, and have sought offset on all major purchases since the F-5.

US industry, with a vast trade surplus in defence equipment, incurs more offset obligations than any other country and, given some of the alleged effects of offsets, this has (not surprisingly) led to calls for the US Congress to limit the offsets that US firms can offer. However, as Bernard Udis and Keith Maskus

(Chapter 14) point out, offsets were not always viewed in such a negative light. In the aftermath of the Second World War and the development of the Cold War in the 1950s and 1960s, the US encouraged the Europeans to licence produce US equipment to strengthen NATO's defence both directly and via the improvements this brought to the European's defence industrial base. In the 1970s, however, the Europeans began to want more than just state-of-the-art equipment from their defence expenditure on US-designed systems. Additional concerns, such as the balance of payments, technology transfer, and domestic employment levels, became prominent. At the same time, concerns grew in the US at the impact that these offsets were having on the domestic defence industrial base, particularly the transfer of technologies which, it was feared, would allow foreign manufacturers to catch up with US firms and then compete with them in world markets. Japan's success in the automobile and consumer electronics fields only served to illustrate the potential dangers.

US prime contractors, of course, would prefer not to give offset but are forced to do so by competitive pressure. Moreover, whilst US firms would like to see offset demands fall, Congressional limitations on what US firms can offer suppliers would be of no help; purchasers would simply take their custom to other manufacturers whose governments impose no such limits on outgoing offsets. Indeed, US primes have to adopt a rather schizophrenic attitude towards offsets: to get sales firms must emphasise the positive impact that offsets will have on the purchaser's economy, whilst at the same time telling Congress that the negative effect on the US economy will be relatively trivial. Recognising the futility of unilateral limits on the offsets that US firms can offer, the US has sought NATO-wide agreement on the gradual elimination of offsets and a more open market for weapons. However, the existence of an implicit US offset requirement that all major weapons systems purchased by the US should have a North American source, and the existence of various other measures (such as the Buy American Act), suggest that the US is not the bastion of free trade in defence equipment that it would have its allies believe! Hence, offsets are likely to persist as a feature of defence purchases for many years to come.

## Endnotes

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