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Saudi Arabia's defence industrial transition: from vision to reality?

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ABSTRACT

The Kingdom of Saudi Arabia has long harboured defence industrial ambitions, but with minimal practical impact. Efforts have been stymied by overly complex regulation, stuttering institutional commitment and an inchoate defence industrial strategy. Vision 2030 changed all that, driven by a 50% localisation goal by 2030. The Kingdom has the world's 5th biggest defence budget and is its 3rd biggest arms importer, reflecting huge market leverage to extract defence offset benefits. The road to localisation has been through overseas acquisition, with the desire to succeed emerging from a stronger national identity along with a determination to exploit strategically unbounded capability opportunities.

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Introduction

Saudi Arabia's earliest efforts to promote defence capability can be traced back to the 1960s UK-Saudi 'magic carpet' programme, when a British Aircraft Corporation (BAC) contract to supply Lightning and Strikemaster aircraft required BAC to construct defence infrastructure foundations (Jane's Group UK Ltd 2024). Yet, in the two decades that followed, only superficial foundations were put in place (Matthews 1996). Undaunted, Riyadh sought to evolve a 'dynamic' defence industrial comparative advantage through import substitution industrialisation (ISI), especially through a supplementary trading mechanism known as offset. This is defined as reciprocal trade, in which a costly acquisition triggers a customer demand for compensatory investment from the supplier company.[1] Offset was, and continues to be, perceived by Riyadh as a major catalyst for ISI, due to the leverage it imposes on suppliers, and any reluctance from the latter would almost certainly lead to their failure to win the defence contract.

Saudi Arabia's early tentative steps towards defence-related ISI came about through the Kingdom's first offset policy in 1984, along with the creation of a Saudi Economic Offset Committee for governance and offset programme monitoring. The large offset liabilities derived from major military acquisition programmes failed, however, to kick-

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start a defence industrial momentum.[2] The Saudi authorities tolerated the resultant defence industrial stasis well into the present Millennium, with the development inertia only coming to an end as regional security deteriorated. Thus, while relations with Israel had improved, two Gulf Wars had been fought between Iraq and Western-supported Arab states, including Saudi Arabia. There were additional security concerns over Tehran's growing belligerence, including its alleged involvement in the conflict engulfing Saudi Arabia's southern neighbour, Yemen. The latter conflict led to Western arms embargoes on Saudi Arabia, obliging it to address strategic vulnerabilities in the face of perceived US and European arms supplier unreliability. The coalescence of these tensions acted to undermine Saudi sovereignty and eventually provoked a policy response via the April 2016 publication of Vision 2030. The launch of such an all-encompassing national security 'Vision' was not isolated to the Kingdom but had emerged as a cultural imperative across the Middle East. A plethora of states had already begun implementing or were in the process of implementing similar security Visions, all aimed at strengthening economic, diplomatic, industrial and defence capabilities.[3]

Saudi Arabia's Vision 2030 was founded on the Kingdom's self-perceived status that it is positioned at the heart of the Arab and Islamic worlds and was therefore at the epicentre of trade between Asia, Europe and Africa (Vision 2030 2016). Accordingly, the Saudi Vision was couched in terms of an Islamic socioeconomic development model, characterised by a strong national identity in which human capital, in conjunction with foreign commercial partnerships, would act as a mechanism for strengthening economic resilience and prosperity (Vision 2030 2016). A significant dimension of the Vision was its commitment to the strengthening of Saudi defence industrial sovereignty through the transformation of acquisition and, particularly, offset practices. This represented a daunting challenge, but today, almost a decade after the launch of the Saudi Vision, it is timely to explore the key elements of the new offset model and the impact it has had on the development of a local defence industry. This, then, represents the purpose of the present article. Structurally, the paper begins by offering a theoretical and practical evaluation of offset. This acts as a preamble to analysing Saudi Arabia's immense defence spending power, both in absolute and relative terms, as the principal driving force behind the major defence industrial reforms introduced since 2016. Broad-based policy reform, endorsed by a robust institutional commitment, provides the contextual backdrop for a critical assessment of the progression towards enhanced supply sovereignty. The immediate policy goal of localisation represents the priority, in tandem, the intent is to pursue the wider agenda of nurturing a dynamic indigenous defence 'ecosystem'. The Saudi government's success in transforming its defence industrial ambitions from a Vision into a practical reality will be gauged in the paper's closing conclusions section.

Defence offset, a concept in flux . . .

The inherent contradiction

Defence offset is arguably the most important of the three non-monetarised components of countertrade; the other two being barter and counter-purchase (Martin 1996). Offset is where the arms purchasing state will use the primary defence sale to leverage a *quid pro quo* demand for reciprocal technology transfer. Thus, for the vendor to close the deal,

contractual compliance requires that offset, and especially technology transfer, be included as part of the Invitation to Tender. By contrast, technology transfer is absent from barter and counter-purchase, whose role is solely to facilitate trade in the absence of convertible currencies, reflecting a 'static' commodity exchange, rather than carrying the potential for 'dynamic' offset-driven transformation. Although offset can act as a mechanism for accelerating local industrialisation (Udis and Maskus 1991), the process will likely struggle if stakeholder goal convergence is absent from the deal. Yet, the misalignment of objectives is invariably the norm, reflected by the country offset authority focusing on long-run indigenous industrial and technological development, while the search for profit and shareholder value dominates the Original Equipment Manufacturer's (OEM's) short-term decision-making; the result being the latter's reluctance to transfer sophisticated technologies for fear of losing competitive advantage and potentially encouraging the emergence of future competitors (Brauer and Dunne, 2004; Martin 1996). The effect of these divergent forces is that offset becomes a competitive battle rather than a synergistic partnership, bringing into question its potential for securing mutually beneficial and sustainable outcomes.

Challenge and controversy abound

The challenge of securing goal symmetry is just one of a myriad economic, technological, political and even cultural factors constraining offset's capacity to deliver on its development objectives. The theoretical and practical legitimacy of countertrade has attracted debate since the mid-19th century.[4] Yet, tensions between offset antagonists and protagonists did not arise until the 1990s liberalist era, when the revived classical mantra of competition and free trade began to encroach into the public sector. Although defence is the ultimate public good, it is also the most imperfect, reflecting high levels of protectionism, government scrutiny, trade control, and diplomatic coercion. Consequently, two schools of thought emerged: one theoretically driven, denouncing offset as anti-competitive and arguing that it contributes to a misallocation of defence resources, and the other offering a more pragmatic viewpoint by advocating a 'second-best' approach, treating offset as just another imperfection in an already imperfect defence economic environment (Lipsey and Lancaster 1957; Schoeni 2015).[5] Yet even 2nd-best devotees struggle to justify the additional costs offset brings to an arms transaction. This offset 'cost premium' undermines the notion that for the procuring country, offset is a cost-free benefit. Invariably, the vendor will seek to protect its profit by loading the additional offset-induced costs of tooling, testing, training, administrative overheads and risk contingencies into the price of the primary defence contract. The broad spread of these costs makes the precise value of the cost premium difficult to ascertain, but estimates range from a low of 5-10 percent (Markowski and Hall 2014) to a high of 30 percent of the primary defence contract value (Struys 1996).[6]

Further troubling aspects of offset include the difficulty of reaching a mutually acceptable valuation of the equipment, techniques and intellectual property to be transferred. Painful negotiations to close the gap between the vendor's higher valuation and the offset authority's lower estimate may stall and even lead to cancellation of the proposed offset contract (Balakrishnan 2018). Moreover, the putative lack of transparency in a complex and poorly understood field of endeavour works against clarity and

accountability and invites the charge of corrupt practices (Magahy, da Cunha, and Pyman 2010). Yet, the debate remains unresolved and offset endures. Today, around 40 countries have offset policies[7] and performance is mixed. To understand more fully the challenges that offset poses, it will be helpful to identify and explain the principal offset policies and then explore how the authorities have integrated them into paradigmatic plans to mould industrial transformation.

From Prescription to Partnership

The process of designing, implementing and monitoring offset is the responsibility of country offset authorities, with a range of policy precepts imposed on offshore corporate vendors. Prescriptive models tend to have rigid, inflexible and immutable guidelines, and are interpreted as such by bureaucrats implementing the policies, causing frustration to vendors (Matthews 2019). No matter how the policies are interpreted, there is a need for clarity and direction, with the starting point being whether offset should be direct or indirect, by reference to the primary defence contract. A direct offset will likely involve licensed production of the foreign weapons system being procured, and by contrast, an indirect offset will be unconnected to the primary defence contract. Industrialised states prefer direct offset as a means of compensating for the loss of orders to the domestic defence industry, but pre-industrialised states may prefer indirect offset to stimulate civil industrial development and kick-start economic growth.[8] Other important early decisions include determination of the 'threshold' value, which signifies when an offset obligation is triggered. There is also the need to set an 'arbitrary' offset value, or 'quota', indicating the value of the required offset investment, defined as a percentage of the primary defence contract value, with values up to 400 percent.[9] Additionally, the offset authority may employ offset multipliers to incentivise targeting of investment into the local economy. Offset multipliers appeal to offshore vendors because they act to reduce onerous investment burdens. For example, if the offset policy guidelines allow for a multiplier of 2 on investment in the strategically important aerospace sector, then a US$10bn offset project will register an offset credit of US$20bn, dramatically accelerating the pace of offset liability discharge (Berkok 2025). Multipliers are thus enormously attractive to vendor companies, but they carry the potential downside of materially reducing offset's beneficial impact on the recipient economy.[10] Another policy designed to incentivise investment is called 'banking', signifying the authority's approval to allow investment values above the agreed offset quota to be applied against offset liabilities created by future defence procurement. South Korea's 2019 offset policy revision introduced a banking provision, which, when used by a foreign OEM to sponsor Korean small medium size enteprise (SME) exports of weapon system parts, would attract a multiplier value of 3 (Cho 2019).

Offset guidelines often also include a 'disincentive' clause to deter vendors from reneging on agreed fulfilment conditions and are normally imposed via a penalty calculated as a percentage of the primary defence contract or through retention of a bond (IFBEC 2015).[11] Risk aversion often rules out decisions to engage with local entrepreneurs on unusual, unorthodox and long-term projects. As a result, offset becomes a mechanical, transactional process that fails to promote creativity and business flair, leading to low value and labour – intensive projects with dubious commercial prospects. There are times

when this may result in calamitous ventures in which a lack of common foresight ensures failure. Malaysia's offset authority, for instance, experienced this outcome twice, when local factories producing British-supplied composite launch rails and the assembly of Turkish Armoured Personnel Carriers (APCs) closed, following completion of the offset programmes (Balakrishnan and Matthews 2009). Similarly, a Philippine offset programme involving the assembly of 142 Simba APCs suffered premature factory closure with the loss of over 100 jobs (Villalon 1998).

The policies outlined above constitute the core ingredients of country offset strategies, devised to achieve development objectives as specified in the published offset guidelines. These high-level strategies represent collective and coherent offset approaches to the conduct of offset activity, but just as important is the flexibility with which the precepts are interpreted. For example, the UK's erstwhile Industrial Participation (offset) Policy (IPP) had a published quota of 100 percent, but the IPP Unit's Head interpreted this to be a 'ceiling' rather than a 'floor', with actual offset quota values often agreed below that level, rationalised on the basis that failure benefits no one (Matthews and Anicetti 2021). As such, flexibility is argued to be a key ingredient for offset effectiveness. The UK's IPP model earned acclaim in this regard, offering clarity through just one succinct paragraph of prescriptive guidance, with its non-legal, non-penalistic, tacit agreement approach focusing on competition rather than compulsion (Matthews 2014). The Ministry of Defence (MoD) also advanced the view that an offset premium would not be paid, based on the logic that foreign OEMs were simply placing orders with proven UK suppliers under normal competitive conditions. The UK model worked well, evidenced by the fact that over the period 1997 to 2012, it generated £10.7bn of inward technology transfer and work placement from offshore vendors, dispersed across more than 2,000 UK defence suppliers (Matthews 2014). Similarly, in the Middle East, the UAE's revised 2019 offset policy offers a flexible approach, encouraging stakeholders to compromise in the search for acceptable outcomes (Rahman 2018). The Japan and Singapore paradigms also provide negotiating fluidity, whereby offset packages are agreed behind closed doors on a 'case-by-case' basis, ensuring agreement against a pre-mandated template of requirements (Chinworth and Matthews 1996; Matthews and Fitriani 2023). South Korea is another state which flexibly interprets its offset policy guidelines on a case-by-case basis (Han and Park 2004). There is also the interesting example of Brazil's prescriptive offset policy accommodating flexible decision-making at the 'assessment-negotiation-selection' pre-implementation stage of the offset life cycle (Jones 2025).

Accordingly, there is a sense that offset flexibility is now increasingly accepted as preferable to prescription, but expectations still need to be managed. Offset projects may struggle to reach their full potential due to offset authorities' over-ambitious assessments of local absorptive capability, including worker skills and the technological capabilities of companies and infrastructure. Realistically, vendors have no choice but to calibrate the level of technology offset with the development level of the recipient country. Otherwise, it is likely that the OEM's international 'brand' will be damaged if it is associated with unacceptably low-quality production, notwithstanding the costs incurred in correcting defects. Thus, a common complaint made by foreign OEMs is the difficulty of finding qualified local offset partners, rather than simply 'eligible' suppliers, as defined by the offset authority. This skill void in the procuring nation's supply base is part of a broader problem reflecting infrastructural deficiencies. Thus, while it is necessary to

promote technology transfer and relocation of work packages, on its own it is not sufficient. What is also required is the domestic capacity to absorb, learn, adapt, develop and disseminate the technologies transferred. For this to happen, an innovative defence 'ecosystem' needs to be cultivated, comprising constituent civil-military industrial and technological interfaces (Matthews and Koh 2019). Aside from the physical interlinkages between primes and their supply chains (essential repositories of innovation), there is a need to stimulate the development of Research and Development (R&D) institutes, technological universities, supportive and proactive government policies, overseas contractors in local defence-industrial clusters, and a science and technology culture, whereby engineering competence is valued. All these factors represent dynamic components that have driven indigenous industrialisation and strong defence ecosystem absorptive capacities in Japan (Hughes 2025; Samuels 1996), Singapore (Matthews and Fitriani 2023), Turkey (Kurç et al. 2025) and South Korea (Bitzinger 2020), but are absent from many of the presently emerging nations. In this sense, the thesis that 'to develop, there is a need to be developed' is a truism. Yet offset can be used to fill the technology absorptive capacity deficiencies in critical domains of emerging defence industrial ecosystems.

Offset is an enigmatic and sensitive field of study, making it difficult to achieve consensus on development trends. It is clear, however, that traditional transaction-based offset policy has not only failed to achieve the depth and breadth of defence industrial transformation sought by recipient countries but is an expensive procurement option due to the burdensome offset cost premium. The result is a discernible movement towards enhanced offset authority-vendor cooperation to optimise cost and capture greater local value added. Such strategies connote more intensive OEM engagement with the local defence community through enhanced investment, assembly and production via joint venture and R&D initiatives. Several states have recently adapted their offset strategies to pursue this flexible and cooperative model. India's offset paradigm, for example, had failed to deliver on its objectives due to inherited centralised planning processes, excessive bureaucracy, policy complexity, industrial immaturity and vendor ambivalence (Philip 2022). Indeed, reports had surfaced in 2020 that the offset policy had been associated with a complete absence of vendor technology transfer (Mathew 2020). This was followed in 2022 by an Indian Parliamentary Report offering a damning indictment of the offset policy's failings:

> The first formal offset deal was agreed in 2007, and since then, a total of 57 agreements have been signed. Vendor offset credit claims worth US$2.64bn have been submitted on 47 of those contracts. Yet, by December 2021, vendors had defaulted, or not performed as contractually required, on a remarkable 21 contracts, representing around 37 percent of all offset agreements, amounting to US$2.24bn. (Grevatt 2022)

In a bid to remedy policy inadequacy, New Delhi announced its intention in 2025 to liberalise its offset model to elicit greater local industry and OEM commitment through an industrial cooperation model (KPMG 2025).[12]

Turkey, by contrast, has proved far more successful in its offset approach, arguably through a focus on international partnerships, including consortia, joint ventures and co-development/production that began almost four decades ago (AktaŞ 2016; Kurç et al. 2025). This contributed to Turkey becoming one of the few countries worldwide to

possess an indigenous capability to secure the industrial baseline for developing home-grown Unmanned Aerial Vehicles (UAVs), space systems and submarine capability. Similarly, with Israel, whose defence and civil offset policy has had the specific aim of adding value to domestic manufacturing through international industrial partnerships, especially focused on 'Military-Civil Fusion' of 4iR (4th industrial Revolution) technologies (Evron 2025; ITA 2023). South Korea's Ministry of National Defence has also switched emphasis from conventional offset to International Cooperation. In pursuit of strengthened partnerships, foreign suppliers are now required to procure a minimum percentage value of local components, institute workshare arrangements, emphasise through-life considerations and promote SMEs and exports as important factors influencing development of the national defence industrial base (Cho 2019). In September 2021, South Korea's Defense Acquisition Program Administration (DAPA) issued a statement that offset would emphasise the Ministry of National Defense's new International Cooperation policy, with priority local sourcing being compared to the US's Buy American and Australia's Industrial Capabilities approaches (Grevatt 2021). The move from formal offset may go further, with reports surfacing in 2023 that offset policy may be abandoned altogether.[13]

Other states, such as the UAE, are nuancing their offset approach away from the traditional model towards partnerships with OEMs, targeting local training and the development of civil-military high technology clusters focused on dual-use high-technology Centres of Excellence (Rossiter and Yates 2025). The biggest switch of all, however, was when Australia, over two decades ago, completely abandoned its formal offset policy. It was replaced with a strategy of work localisation and technology transfer, agreed contractually in the primary defence contract without the pressure of pre-determined offset quotas, multipliers and penalties. Canberra now provides no official guidelines or parameters regarding reciprocal investment, but foreign contractor bids must incorporate opportunities to maximise local industrial involvement, and, where appropriate, export opportunities. The targeted level of local participation is flexible, but for defence programmes there are reports that a 50-60 percent level was reached on the Future Frigate Programme and Air Warfare Destroyer (Defence Connect 2018). Qatar has a similar model in place, as evidenced by its 2017 US$6.8bn procurement of 24 Eurofighters, which included a package of support and training agreed as part of the primary defence contract (Tovey 2018; Villarejo 2020). Reviewing these diverse developments, it seems unlikely that offset will completely disappear in the future, but will rather morph into different business partnership models.

Power of the Saudi defence dollar

Saudi Arabia's incipient defence industry has also begun to tread the path towards offset partnership after decades of reliance on transactional offset, i.e. solely the transfer of basic work packages to satisfy policy mandates rather than a focus on dynamic growth opportunities. Following the 2016 launch of Vision 2030, Riyadh now rationalises that the only feasible way to accelerate localisation is to persuade overseas suppliers to engage more actively in the Kingdom's assembly and production processes. Thus, foreign acquisition, rather than signifying dependence, has, paradoxically, become the principal vehicle for progressing localisation. The process comes at a cost, however. During the

early phases of developing a defence industry, localisation will inevitably incur unavoidable opportunity costs compared to off-the-shelf overseas acquisition. These costs will be high, due to immature learning cycles, constrained scale, limited skills and constrained capacity, but can be eroded through substantial export sales.[14] Yet, Saudi Arabia is a newcomer to the arms business, and penetration of overseas arms markets will be challenging. To promote arms export capability, the creation of a robust indigenous defence industrial capacity will be necessary but not sufficient, given the imperative of also securing quality in both product and process. This will require development of a broader industrial ecosystem representing knowledge-intensive expertise through abundant and varied engineering professions, high-technology supply chains and civil-military R&D institutes to incubate innovative technologies. Such a transformation will be costly, but Riyadh appears aware that the qualifying and enduring attribute of localisation is a hefty defence budget, which it can accommodate.

Since 2016, Saudi Arabia's defence finances have expanded *pari passu* with its defence industrial ambitions. Table 1 illustrates the surge of financial resources devoted to defence. Indeed, Vision 2030 is anticipated to drive the compound annual growth rate of Saudi Arabia's defence budget by 4.5% until 2028 (Defence Review Asia 2023). Military Expenditure (MILEX) rose from US$64bn in 2016 to US$80bn in 2024, representing around 25% of government expenditure (US International Trade Administration 2024). The share of MILEX in national income (GDP) at 6.5% is high, but has declined over the same period, because GDP has increased three times faster than defence spending.[15] The defence procurement spend between 2021 and 2024 rose from US$8.6bn to US$11.9bn, with its share in the defence budget rising from 45% to a remarkable 55%, much higher than the international norm.[16]

Table 2 provides a comparative perspective on Saudi Arabia's defence finances. Significantly, the Kingdom has the world's fifth biggest defence expenditure, greater than those of the major defence economies, Germany, France and the UK. Saudi Arabia's 2023 Milex/GDP ratio was more than twice that of the US, and greater even than that of Russia, whose economy was on a war footing. Indeed, Saudi Arabia was among the 10 largest spenders in 2023, with only the extreme case of war-affected Ukraine spending a larger share of its GDP on defence, at 37% (Hammond 2024). The ratio is the highest among the six Gulf Cooperation Council (GCC) states, twice that of neighbouring UAE, and on a par with that of Turkey, having over twice the population of Saudi Arabia. The Kingdom's huge defence budget supports its massive appetite for sophisticated military systems, constituting the biggest defence market in the MENA

Table 1. Saudi Arabia defence-related finance (2016–2024).

	2016	2017	2018	2019	2020	2021	2022	2023	2024
GDP ($ bn)[a]	689	741	887	889	768	983	1,240	1,220	1,240
MILEX ($bn)[b]	63.7	70.4	74.6	65.4	64.6	63.2	70.9	75.8	80.3[d]
MILEX/GDP (%)	9.3	9.5	8.4	7.4	6.6	7.2	6.8	5.7	6.5
Procurement Spend ($ bn)[c]	n.a.	n.a.	n.a.	n.a.	n.a.	8.6	9.2	10.7	11.9

[a]See World Bank Group (2025a).
[b]See World Bank Group (2025b).
[c]See Jane's Group UK Ltd (2024).
[d]See SIPRI (2025).

Table 2. Comparative defence statistics, selected countries (2024).

Country	Milex (US$ bn)	GDP (US$ bn)	Population (mn)	Milex/GDP (%)	GDP per capita (US$)	Arms Imports (TIVs)
United States	968	29,184	340.1	3.3	80,559	1,209
China	317	18,743	1,409.0	1.7	12,500	72
Russia	150	2,173	143.5	6.9	14,113	467
India	84	3,912	1,450.9	2.1	2,553	1,168
Saudi Arabia	80	1,237	35.3	6.5	29,738	1,111
United Kingdom	77	3,643	69.2	2.1	49,115	643
Germany	86	4,659	83.5	1.8	52,749	239
France	63	3,162	68.5	2.0	46,005	188
Turkey	22	1,323	85.5	1.7	13,259	381
Egypt	3	389	116.5	0.8	3,597	72
UAE	20	537	10.9	3.7	50,417	932
Qatar	8	217	2.9	3.7	93,687	1,152
Oman	6	107	5.3	5.6	28,719	4

Source: SIPRI (2025); International Institute of Strategic Studies (2024); IMF (2025); World Bank Group (2025c).
The arms import data are sourced from the SIPRI Arms Transfer database. The figures are calculated according to Trend Indicator Values (TIV – a military capability price index), and should not, therefore, be compared with other data in the Table calculated from monetary values. However, the TIV data does afford international arms import comparisons, providing comparative orders of magnitude.

region (Middle East and North Africa), which historically dominates the global arms trade (Mazzucco 2023). Saudi Arabia was also the world's third biggest arms importer in 2024, after India and Qatar (MEM 2025). Yet, arms trade figures can fluctuate wildly, and a better guide to emerging trends is to examine imports over five-year periods. Employing this approach, Saudi Arabia received 12 percent of US arms transfers across 2020-24, making it the largest recipient of American arms exports (MEM 2025). This trend is set to continue, after President Trump and Saudi Crown Prince Mohammed bin Salman signed a US$142 bn arms deal in May 2025 - the biggest in history (Stringer 2025).

Defence industrial policy démarche

Although Saudi Arabia launched its formal offset programme in 1984, the first GCC member state to do so (Ramady 2020), the policy suffered from being loosely coordinated and inconsistently interpreted, with the result that an indigenous defence industry failed to emerge. It was a start, however, and the first offset programme was Boeing's 1985 *Peace Shield*, which created six local offset companies linked to the Kingdom's acquisition of US Surface-to-Air Missiles (SAMs) (Ramady 2005). Boeing was the prime contractor, responsible for ensuring that the 35% direct offset was completed during the agreed period (Matthews 1996). The second major offset programme was *Al Yamamah* (the 'Dove'), which was tied to the UK sale of 72 Tornado fighters, along with other associated military systems (Ramady 2005). In contrast to *Peace Shield*, the *Al Yamamah* offset programme was 'indirect', with the prime contractor, BAES, responsible for clearing an agreed £1bn offset liability across a 10-year period (Matthews 1996). While the *Peace Shield* offset obligation was completed in a timely way, *Al Yamamah* was delayed by several years due to the onset of regional wars as well as difficulties encountered in persuading civil companies, such as sugar refiners and pharmaceutical manufacturers, to invest in the Kingdom against the riskless option of continuing to export. The 1980s third major offset programme was the French *Al Sawari*, which was linked to the 'anticipated' sale of three La Fayette stealthy frigates (Matthews 1996). This was also an indirect offset

programme carrying a 35% offset obligation that targeted civil projects, such as gold conversion, electric meters, chemicals and printed circuit boards (Ramady 2005).

The Saudi offset authorities envisaged that these three major offset agreements would generate around 75,000 Saudi jobs, but by the early 1990s, only 1,400 jobs had been created, and only a small proportion of these were Saudi positions, mostly unskilled (Matthews 1996). In the longer term, capitalisation and local job creation expanded, but the pace remained slow. By 2006, the Kingdom had established 36 offset companies, capitalised at US$4.5bn, employing 6,500 people (Oxford Business Group 2015). Although a dramatic improvement over the 1980s offset performance, it remained a disappointing return compared to the 1988-2006 total foreign military acquisition spend of US$150bn (Oxford Business Group 2015). It has been estimated that the spend equated to US$45-55bn of offset obligations, but just 13% went into military-relevant aircraft and electronics industries, with indirect offset in civil sectors, such as food, medicine and health management, being the principal beneficiaries (Gaub and Stanley-Lockman 2017). Moreover, the three offset programmes proved an immensely expensive job creation programme, generating just 120-150 positions per US$1bn of investment (AT Kearney 2015). There is also a question over the sustainability of the jobs created, given that by 2016, the year Vision 2030 was launched, reportedly less than 4,000 offset-generated Saudi jobs remained (Vats and Serrano 2016). Saudi offsets have struggled to increase Saudi manufacturing jobs, symbolising the policy's failure to create a localisation momentum, and perpetuating the continuation of a high level of arms import dependence rather than the planned widening and deepening of local defence industrial capacity.

Several reasons can be advanced to explain the failure of Saudi Arabia's offset experience, when measured against SEOC policy objectives of Saudi-isation, skill enhancement and economic diversification. Firstly, the policy framework was a work-in-progress, reflecting *ad hoc* application of policy instruments, including quotas, penalties and delivery timelines. Secondly, the policy thrust was not firmly on 'direct' or even 'dual use' offsets to foster (civil) military industrialisation but instead accommodated a high proportion of indirect civil investment. Thirdly, much of the offset was 'transactional' in the sense of being short-term work packages to fulfil offset obligations and financially compensate the Kingdom for the huge acquisition outlays leaking out of the local defence economy, rather than emphasising the long-term creation of local capacity and capability to reduce dependence on foreign supply. Saudi offset, then, did not act to catalyse foreign investment as a vehicle for localisation, and the plan to foster sustainable indigenous defence industrial capability was stillborn.

Yet, the Saudis never lost faith in developing a sovereign defence industrial base, and a new dawn commenced following the arrival of Mohammed bin Salman as Defence Minister in 2015, with his initiatives profoundly transforming the Saudi defence industrial landscape. Through Vision 2030, he aimed to move beyond the Kingdom's hitherto myopic approach to defence planning by engendering a realist strategic offset model for tackling the 21st century's defence industrial challenges.[17] Mohammed bin Salman aimed to rectify the imbalance between Saudi Arabia's global ranking as the third biggest arms importer and the country's meagre defence industrial status, evidenced by the country's tiny two percent share of local arms production at the launch of the Vision (Forrester 2021a). Vision 2030 represented a radical policy démarche under which the development of a sustainable domestic military-industrial base was elevated to become

one of the Kingdom's 11 sectoral priorities.[18] An ambitious 2030 target was set to achieve 50% localisation, representing a level 25 times greater than that prevailing in 2016 (Vats and Serrano 2016). The Kingdom's 2030 Vision states that 'a key aim is to localise a minimum of 50% of military equipment and services spending by 2030 through participation between the contractor and local companies' (GAMI (2019); Czulda 2024). Accordingly, this ratio became the key metric for measuring progress towards defence industrial sovereignty

To foster defence localisation, a raft of new institutional governance and management structures was established (PWC 2021). Most importantly, two monolithic organisations were created in 2017. The first was called General Authority for Military Industries (GAMI), whose purpose is to act as the regulator, enabler and licensor of Saudi Arabia's military industries sector. At the operational level, the agency would be responsible for defence-related procurement, through-life support, logistical capability, external technology transfer and domestic R&D, while at the strategic level, it would propose new policies, strategies, and regulations for the acquisition of all defence platforms and services. The intent is to construct a Saudi military industrial complex, comprising a reservoir of suitably qualified, skilled engineers to service an emerging network of civil-military supply chains within innovative defence industrial clusters. Contributing to this process, the number of licensed international defence companies would increase through the streamlining of the Kingdom's licensing processes, even allowing foreign companies 100% ownership (US International Trade Administration 2024). Of course, there would still be the temptation for overseas entities to source supplies from their 'mother' defence economies, but GAMI intended to grow domestic value added through foreign OEM investment partners being attracted by the scale of local market opportunities.

The rate of localisation would thus be influenced by the degree of foreign investment in the defence sector, leveraged by high levels of Saudi defence spending that were predicted to remain healthy in the future. For example, a 2023 report from U.S. credit ratings company, Fitch Solutions, expects that strong Saudi demand will continue across all segments of its defence industry, including ground and air equipment, naval and air defence capabilities, cybersecurity, C4ISR equipment, UAV capability, aircraft engines, and military fixed-wing aircraft (US International Trade Administration 2024). If Saudi arms procurement remains robust, then so too will offset. Indeed, Frost & Sullivan predicts that the Kingdom's military offset market will grow at an annual rate of 3.9%, based on the continuation of major defence acquisitions (Oxford Business Group 2015). In a similar vein, the consultancy company A.T. Kearney argues that if offset requirements are enforced, potential capital investment in sectors such as aerospace will create more than 84,000 jobs in Saudi Arabia (Oxford Business Group 2015).

The second major Saudi defence organisation established following the publication of Vision 2030 was Saudi Arabian Military Industries (SAMI). A 100% subsidiary of the Public Investment Fund, it aims to promote local manufacturing capacity to reduce the Kingdom's high dependence on foreign arms procurement. SAMI contracts directly with overseas companies, and its scope encompasses land, sea and air military systems. SAMI is also the lead government agency for implementing Joint Ventures (JVs) as a condition for winning government contracts. Reportedly, the JV model reflects a division of labour in which the Saudi partner focuses on business development and the winning of government contracts, while the foreign partner concentrates on establishing production lines

(US International Trade Administration 2024). As Saudi Arabia's top defence company, SAMI aims to expand the business by emulating the growth strategy of the UAE's EDGE, whose launch in 2019 was based on the consolidation of local defence companies (Vidal, n.d.). EDGE's huge, consolidated defence sales ensured that in 2021, from nowhere, the conglomerate was ranked as the world's 24th biggest company (Defense News 2024).

Progress towards 2030 . . .

First defence industrial transformation goal: 50% localisation

Saudi Arabia has set out two primary defence industrial transformation goals to be achieved by 2030. The first, as earlier mentioned, is an official 50% localisation target that derives directly from the Vision framework. Many observers argue the goal is lofty,[19] especially as the deadline allows only 15 years for policy to make a meaningful impact on what are inherently long defence life cycles (Gaub and Stanley-Lockman 2017). To date, however, Saudi Arabia's policy regime has achieved impressive progress. From just 2% localisation in 2016, the rate jumped to 8% in 2020, 13.7% in 2022, and by mid-2023, it was declared to be close to 15% (Czulda 2024). By June 2022, GAMI had issued 291 new licenses to defence companies (US International Trade Administration 2024), with the defence sector expected to contribute US$25bn to GDP by 2030, creating around 100,000 jobs – 40,000 direct and 60,000 indirect, employed in local supply chains (Vogel 2019). To boost localisation, GAMI also launched a revised 2019 offset framework, changing the terminology to call it an Industrial Participation Program (IPP). The IPP was framed to ensure it contributes more effectively to the defence localisation agenda. The intent has been to reinvigorate the offset culture by changing it from the hitherto short-term contractual approach to a more flexible, longer-term, high-value-added manufacturing model.

The IPP does not prescribe a specific business model for fulfilling obligations, and each programme is evaluated on a case-by-case basis against the contractor's obligations, which may involve localising positions and/or building capabilities.[20] Contractors seeking to discharge obligations must undergo a comprehensive assessment to determine their capability to localise.[21] The IPP is aligned with progress towards Vision 2030, and is aimed at supporting capability building (investment, transfer of technology and R&D) in the priority sectors by fostering indigenous development beyond the rigid prescriptive parameters of simply clearing IPP obligations.[22] The essence of the 2019 offset revisions is flexibility, allowing contractual arrangements to adapt to changing defence industrial conditions, and encouraging policy interpretation to promote diverse subsystem solutions and future product development opportunities as a means of ultimately securing independent export opportunities.[23] The different methods of compliance include business frameworks, such as subcontracting, partnerships and JVs, that are tailored to the capabilities and strategic interests of both foreign vendors and Saudi entities.[24]

Subcontracts, for example, include those for the 2022 Lockheed Martin deal for the Terminal High Altitude Area Defence (THAAD) System (Forrester 2022a). The programme comprises two subcontracting fields: the first being domestic production of missile interceptor launchers, and the second, the manufacture of missile interceptor cannisters (Forrester 2022a), with both aimed at enhancing manufacturing capabilities in the

Kingdom (Arabian Defence 2024). Strategic alliances are also factored into the Kingdom's offset strategy as a means of deepening partnership opportunities. For example, in April 2024, Raytheon announced a series of initiatives as part of a strategic alliance designed to contribute to strengthening Saudi Arabia's evolving defence-industrial ecosystem. These include manufacturing and testing of components for the Kingdom's Patriot Air Defence System, training and deployment of Saudi personnel for the maintenance and repair of associated components, development of local supply chains, as well as opportunities for engagement in Raytheon's international supply chains (Defense Arabia 2024). The IPP also explicitly includes JVs as a mechanism for discharging investment obligations (GAMI 2019). Indeed, policy implementation experience confirms that Riyadh exhibits a preference for JV investment, including local assembly lines, as the principal manufacturing and technology transfer vehicle (Mazzucco 2023).

The IPP investment target was increased to 60% of the primary defence contract value and now focuses solely on direct and dual-use IPP projects. The policy also offers sectoral incentives through valuation factors (multipliers) of 1-3 for Transfer of Technology and 2-5 for R&D investment and investment into local companies, including small and medium size enterprises (SMEs) (GAMI 2019). Strengthening Saudi Arabia's negotiating position to extract the maximum infusion of meaningful investment, GAMI now demands that the IPP package must be agreed by both parties before signing off on the acquisition contract (GAMI 2019). Although the IPP makes an important contribution to the growth of in-country production capacity, GAMI is conscious of the longer-term imperative of securing competitiveness and innovation to achieve not just capacity widening but also deepening. The aim is to cultivate the growth of indigenous 'technological absorptive capacity' within a broader-based defence industrial ecosystem.

Contributing to the evolution of this ecosystem, the Saudi government announced in 2021 that 50% of the planned US$20bn funds to be invested in the military industry over the next decade will be allocated to R&D (Reuters 2021). Riyadh's ultimate aim is to raise twentyfold the R&D budget as a proportion of defence spending, from the low of 0.2% in 2016 to around 4% by 2030 (Vogel 2019). To further support the technological dynamics of localisation, a focus on seven key research and innovation areas was published in 2020, covering electro-optics, directed energy, radar systems, radios, cyber security, electromagnetic weapons and artificial intelligence (Forrester 2022b). In 2021, GAMI published the Kingdom's National Military Industries Sector Strategy, which rationalised that the planned development of 21 indigenous technologies across those seven research domains would require a whole ecosystem of research and technology institutions, a skilled workforce and other support functions, in addition to local production activities (Arab News 2021). Thus, the core pillars of Saudi defence industrialisation are not only acquisition and industry, but also, importantly, R&D (Forrester 2021b). In the same year, the push for local R&D efforts to promote self-reliance was bolstered by the launch of the General Authority for Defence Development (GADD), with a remit to formulate and oversee R&D policies and strategies aimed at nurturing advancements in defence technologies (Oxford Business Group 2024). This multiplicity of agencies could potentially introduce inefficiencies through duplicative effort and a lack of coordination, yet to date, no evidence has emerged to suggest this is the case.

As part of the overall strategy to foster competitiveness and innovation, GAMI has sought to unlock the potential of local and foreign industry R&D participation. For

example, local R&D networks have emerged, including the partnership between TAQNIA Defense Investment and Securities Technologies[25] and Saudi Arabian Defense Electronics Company (SADEC) to sponsor research in collaboration with local universities (US-Saudi Business Council 2021) and through investment by SAMI Navantia Naval Industries into a Naval Systems Integration and Development Center of Excellence in early 2024 (World Defense Show 2024). Yet not all R&D initiatives are proactive; some are reactive. Cyber and drone resilience are viewed as constituent elements of national security inextricably linked to the Kingdom's energy base and essential for Saudi Arabia's economic and strategic security, but its critical asset infrastructure vulnerabilities were exposed by the 'Shamoon' cyber-attack on Saudi ARAMCO oil facilities in 2012 (Vats and Serrano 2016). There was also the drone and missile attack in 2019, in which Iran was allegedly behind, temporarily knocking out two Saudi oil facilities, and taking offline about 5% of oil production (Al-Atrush and England 2021). These attacks led to the acquisition of appropriate military capability, such as the 2023 agreement between Saudi company, SRB Aerial Systems, and the US firm, Collins Aerospace, to produce drones (Collins Aerospace 2023), and the 2024 Thales and Saudi Aramco JV company, Cyberani, aimed at addressing the kingdom's cybersecurity needs (Thales 2024).

GAMI also places a premium on the development of specialist local suppliers as a critical ingredient of prime-subcontractor innovation relationships. For example, in 2021, GAMI implemented a supply chain localisation programme that quickly identified 74 supply chain investment opportunities worth billions of dollars (Forrester 2021c).[26] As part of the process of encouraging industrial innovation, GAMI also pushes for increased private sector SME engagement in emerging defence supply chains. Hence, in 2020, via a JV between the French company CMN and local company Zamil Offshore, the first vessel ever to be built in Saudi Arabia was one of 18 locally assembled HS132 interceptors, with follow-on Maintenance, Repair, and Overhaul (MRO) services conducted at Zamil's Damman yard (Al-Sulami 2020; Forrester 2022a). Similarly, BAES' 2020 quality license award to local firm, Wahaj, enabled the latter company to machine and test metallic and non-metallic components for the Royal Saudi Air Force's (RSAF) Eurofighter Typhoon fleet (Forrester 2022a).[27]

Second defence industrial transformation goal: enter global top 25 defence rankings

Saudi Arabia's second primary defence industrial goal is aspirational rather than deriving from an official policy statement. It reflects the aim of Walid Abukhaled, SAMI's CEO, that the company enters the global top 25 defence company rankings by 2030 (Oxford Business Group 2015). As with Vision 2030's localisation target, it is a heady goal, but here again, remarkable progress has been made. From a payroll of just 63 staff in 2018, SAMI's numbers have grown to over 3,000 employees by 2023, of which 84% were Saudi (Radwan 2023). Moreover, there are plans to add a further 1,500 jobs to service the company's expanding arms sales, which by mid-2024 had created a backlog of more than US$10bn (Mazzucco 2023). Impressive corporate growth has ensured that SAMI has quickly become the country's national defence industrial champion, entering the *Defense News* top 100 defence firms for the first time in 2022 at 98th, then rising 19 places a year later to reach 79th, and in 2024 becoming the 75th biggest defence company in the world (Defense News 2024).

SAMI's remarkable progress towards achieving the goals of both localisation and industrial expansion is sourced from three interrelated growth dynamics. Firstly, a process of organic expansion was pursued through industrial consolidation and MoD contracts. Since its inception, SAMI has aggressively expanded its portfolio of defence subsidiaries by acquiring established manufacturing companies from within the Kingdom. For example, it acquired majority stakes in former Boeing offset company, Aircraft Accessories and Components Company in 2019, and the Advanced Electronics Company in 2020; the latter considered to be the 'Crown Jewel' in Saudi's military industries – with the deal representing the biggest military industries acquisition ever concluded in Saudi Arabia (Arab News 2019; Forrester 2020b; SAMI Advanced Electronics 2020).[28] Further fuelling this expansion, SAMI has been the recipient of continuous MoD contracts. For example, in 2022, it was awarded a US$1.6bn MoD contract for advanced RSAF logistical support and F-15 Eagle training services (Forrester 2022c).

The second source of growth is via a complementary expansionary strategy aimed at acquiring mature overseas defence companies. The most obvious example is SAMI's 2018 bid to acquire a minority stake in the South African company, 'Rheinmetall Denel Munition' - a JV between South African defence company, Denel, and Germany's Rheinmetall (defenceWeb 2018). In 2016, this JV reportedly opened a projectiles factory in Al-Kharj in collaboration with Saudi arms giant, MIC (Gaub and Stanley-Lockman 2017). Riyadh has also made overtures to participate as a full partner in the Global Combat Air Programme, a British-Italian-Japanese initiative to develop a sixth-generation fighter called Tempest (Jolly 2023).

The third defence industrial localisation and growth mechanism is JVs for the assembly of weapons platforms and local component manufacture. The significance of this IPP vehicle is that it is arguably the most effective means of ensuring overseas stakeholder commitment to the future success of Saudi defence localisation. A major problem, though, is that JVs inevitably increase complexity and cost, which inevitably translates into an 'offset' cost premium for establishing local capacity compared to off-the-shelf acquisition.[29] Nevertheless, the Saudi JV paradigm appears to be working well, and by November 2022, the SAMI Group had established 12 JVs with some of the world's leading defence OEMs, many of them US contractors (Vidal, n.d.). Capacity building is an important aim of JVs, as evidenced by the Kingdom becoming the final assembly country for its procurement of US-made AH-64D helicopters and F-15SA Eagle fighters, including the building of wings for 68 remanufactured aircraft (Jane's Group UK Ltd 2024). JVs provide other ancillary benefits, however. For example, the 2020 JV signed between US firm Oshkosh and local Saudi firm Al Tadrea to produce tactical wheeled vehicles has enabled the latter to become the prime contractor, with both partners working to develop intellectual property (Forrester 2020a). SAMI also seeks MRO capability through JVs, including its 51% stake in the mid-2022 Saudi-Boeing joint venture, which established the Saudi Rotorcraft Support Company, involving first- and second-line maintenance on a range of aircraft, including F-15s and C-130s, in addition to helicopters (Arab News 2022).

European companies are also heavily involved in Saudi JV operations. In 2018, for example, SAMI established a JV with the Spanish state-owned shipbuilding company, Navantia, for the outfitting of five AVANTE 2200 vessels (Naval News 2024). The in-country JV venture included responsibility for combat systems integration and installation, development of systems architecture, software development, hardware design and testing,

prototyping, simulation and through-life support (Naval News 2024). The contract is expected to generate around 6,000 jobs, including 1,100 direct jobs, 1,800 in the auxiliary industry, and more than 3,000 in the supply chains (Naval News 2024). Furthermore, this naval JV has spawned a series of Saudi innovations, including the Hazem integrated combat system, the Mulhim battlefield system, and the Roaya lightweight armoured turret (Radwan 2023). In 2019, SAMI signed a similar JV deal with the French aerospace company, Thales, to produce air defence radars, missiles, and communications equipment, involving full transfer of technology to generate new intellectual property, and 2,000 Saudi jobs (Saudi Gazette 2019). In 2021, SAMI signed a Memorandum of Understanding (MoU) with Europe's MBDA to establish a JV to produce tactical missile systems, including the construction of a missile MRO centre (Argaam 2022). In the same year, an agreement with Rolls-Royce was signed for the local repair and overhaul of the Typhoon's Eurojet EJ200 turbofan engine (Forrester 2021c). In 2022, Germany's Rheinmetall entered into a JV with the local MAZ Group to undertake MRO work, upgrades and R&D on Saudi Arabia's Skyguard anti-aircraft guns, with technology transfer from the German company's Swiss-based Oerlikon enabling 60% localisation of work in the Kingdom (Forrester 2022d). Going forward, SAMI is negotiating the acquisition of 54 of the latest F-15EX fighters, French Rafale fighters, and the reactivation of plans to procure at least 48 Eurofighter Typhoons -adding to the 72 fighters already in the RSAF fleet – all these deals involving local assembly.[30]

Saudi Arabia has also been nurturing JVs with non-traditional suppliers from across the world. For instance, in 2017, SAMI signed a series of agreements with Russia for Saudi production of munitions and artillery systems (Jane's Group UK Ltd 2024). In 2019, it signed a JV deal with the South Korean conglomerate, Hanwha, to initially produce munitions before expanding capability to supply rockets, artillery, and naval systems as well as C4ISR technologies (Zawya 2019). In 2022, SAMI signed deals with Singapore's ST Engineering to jointly develop defence systems and autonomous solutions (Zawya 2022), and with China to locally manufacture unmanned aerial vehicle payload systems (DefenseMirror.Com 2022). In 2023, SAMI signed an MoU with Embraer to expand the latter's operational footprint in the Kingdom via an assembly line and maintenance capability for the Brazilian company's KC390 military transport aircraft (Jennings 2023). In the same year, an agreement was signed between the Saudi MOD and Turkey's Baykar to allow SAMI to assemble the Bayraktar Akinci twin turboprop unmanned aircraft system, build the Akinci airframe, and produce the avionics, cabling, and harnesses, to manufacture the aircraft in Saudi Arabia (Times Aerospace 2024). A further twist to the Kingdom's impressive defence industrial development record has regard to the 2021 joint development, between the Saudi company INDRA Defense Technologies and several Turkish firms, of a UAV called the Haboob, which led to a subsequent deal in 2023 for an INTRA-designed UAV to be manufactured in Turkey – the first time that a Saudi defence product has been produced outside the Kingdom (Belbagi 2024). There are also reports of SAMI's interest in procuring up to 100 Turkish 5th-generation KAAN fighters, developed through collaboration with BAES and Rolls-Royce (EJ200 engines), offering potential technological synergies with Saudi Arabia's fleet of BAES Eurofighter Typhoons along with their EJ200 engines (Army Recognition Group 2024).

Conclusion

Saudi Arabia has the World's fifth biggest defence budget and the third biggest military market. Yet, after decades of huge investment in arms programmes, the Kingdom has failed to develop a domestic defence industrial base. There is no one factor behind this disappointing performance, but the absence of institutional commitment, insightful strategic planning and a commercial culture were probably among the principal causes. Additionally, there was over-reliance on a flawed offset policy to transform Saudi Arabia from an arms import-dependent state into a sovereign defence industrial power. Offset might work for advanced economies, possessing a diverse, established and competitive defence industry, but for developing states, stakeholder goal divergence and the absence of absorptive technological capability, weaken offset's role as a transformational vehicle. In 2016, everything changed and Saudi Arabia finally got serious about defence industrialisation. Vision 2030 proved the catalyst for strengthening the Kingdom's commitment, culture, and commercial attributes, and no more so than in the defence sector. The process of Saudi defence industrialisation was deliberately interventionist and centrally orchestrated, with powerful governmental entities, GAMI (policy, planning and governance), SAMI (consolidated defence conglomerate), and GADD (R&D) at the helm. Massive foreign arms acquisition provided the leverage to infuse productive capacity and capability into the development of an emergent Saudi defence industrial ecosystem.

Saudi Arabia is forging a new offset paradigm that replaces the traditional short-term transactional approach with a long-term strategic model seeking to achieve progress through the imperative of international partnership. Global OEMs are attracted by the high scale of Saudi defence procurement but must now operate according to a new and robust offset policy regime. The Saudi IPP is best described as 'hybrid'. While prescriptive policies are in evidence, such as the IP guidelines, the edict on localisation of regional HQs, and the requirement for simultaneous signing of IPP and acquisition contracts, the policy emphasis is now far more flexible in its interpretation. For example, IP business solutions are mutually negotiated between offshore vendors and the offset authority, and changes to contractual arrangements are feasible, subject to the agreement of GAMI. Moreover, the Kingdom views offset as a transitory process to gain local technological prowess and is committed to a supplementary strategy of building a defence innovation culture through R&D partnerships with local universities and research centres supported by high and rising levels of funding. Other features of the localisation push include supply diversity through strategic partnerships with non-Western suppliers, and determined moves into cyber, drone, missile and radar and critical technologies, such as THAAD systems and Eurojet engines. These partnerships not only satisfy local security needs but also demonstrate an ambition to achieve self-sufficiency in advanced defence technologies. The beginnings of meaningful Saudi defence export capabilities are also evident, as exemplified by the UAV technology transfer to Turkey. Overall, then, there are signs that the design and manufacturing infrastructure acquired through IPP partnerships will drive industrial transformation at an unprecedented pace.

Yet, while the transformation process is impressive, the Vision's goal of 50% localisation alongside SAMI's aim of entering the global top 25 defence companies by 2030 remain

ambitious, especially as only five years remain to hit these targets. The early strong localisation and defence capability trajectory may be due to 'low-hanging fruit' offset opportunities, with longer-term defence industrial transformation likely to prove more demanding. The bar has clearly been set high, but perhaps this misses the point, as whatever the 2030 outcome, there is little doubt that Saudi Arabia has made tremendous progress towards achieving enhanced defence industrial sovereignty.

Notes

1. Offset definitions vary, but most focus on their role in providing compensatory investment. See, for instance, a European perspective, "Offsets are compensations offered by the seller to the buyer of (in our case) defence equipment of so called off-the-shelf character, i.e. already developed systems," see, Eriksson et al. (2007); and a US view defines offset in defense trade as encompassing a "range of industrial and commercial benefits provided to foreign governments as an inducement or condition to purchase military goods or services, including benefits such as co-production, licensed production, subcontracting, technology transfer, purchasing, and credit assistance. This mandatory compensation can be directly related to the purchased defense article or service, or it can involve activities or goods unrelated to the defense sale." See, US Department of Commerce (2024).
2. Nevertheless, it is argued that the four offset companies established under the 1985 Peace Shield programme are the backbone of the Kingdom's present defence industrial base. See, Jane's Group UK Ltd (2024)
3. In 2008, Qatar launched its Vision 2030 policy framework. This was followed in February 2016 by Egypt, which introduced its own Vision 2030 version – incorporating a 2020-30 military integrated plan. In 2022, the United Arab Emirates embarked on the 'We the UAE 2031 Vision', including the important 7th Principle that emphasizes digital, technical, and scientific excellence. Then in October 2023, Turkey introduced Vision 2053, embracing a long-term goal of becoming a global defence and space powerhouse.
4. A good example is 19th-century China's insistence that silver be the medium of exchange for its silk, tea, spices, and porcelain, but as the British had little silver reserves, opium was pressed as an alternative commodity and enforced by gunboat diplomacy. See, *World History: Imperialism in China, Opium Wars and Open Door Policy*, August 25, 2016. For a more recent treatment of the use of barter in arms transactions, see Matthews and Anicetti (2024).
5. It should be noted that 2nd best theoretical arguments go beyond the economics of the defence market and can be applied to trade-offs and externalities in such diverse economic fields as environmental regulation, digitization, monopoly power, information asymmetry and globalisation, as well as to the non-economic dimension, 'security of supply' – a key objective for arms importing states. In the latter context, see Krause (1995); Krause and Charles (1997).
6. Note, however, that if OEMs are seeking entry into potentially highly profitable markets, the premium may be zero. See, Ron Matthews, *The UK Offset Model: From Participation to Engagement*, RUSI Whitehall Report, 2014.
7. *Countertrade and Offset* (CTO), August 30, 2023. This is in stark contrast to the oft-quoted figure of 130 countries possessing offset policies.
8. This was the case with respect to Saudi Arabia's 1988 Al Yamamah offset programme with the UK. See Matthews, R. 1996. 'Saudi Arabia's Defence Offset Programmes'.
9. South Africa's early 2000's procurement of German warships and submarines, Swedish JAS-39 Gripen fighters, and UK Hawk trainers is an example of where the offset package exceeded 400% of the primary defence contract value. Defence offset reached $2.4 billion (60% of the contract value) and civil offset was $14 billion (350% of the contract value), totalling more than four times the value of the signed contracts. See, Botha (2003).

10. This same South Africa arms procurement demonstrates how the offset multiplier can be 'abused'. See, See, Matthews and Koh (2019).
11. A unique offset policy disincentive introduced by India in 2020 is a 'negative' multiplier, intended to discourage OEMs from buying overseas parts and components to fulfil their obligations. See, Behere (2020).
12. In a novel approach, New Delhi released a 3rd positive list of 101 banned defence imports in 2022 to stimulate local defence-related R&D. See, 'Aatmanirbharta' in Defence: Prime Minister Shri Narendra Modi announces Fourth Positive Indigenisation List of 101 Items During DefExpo 2022,' *PIB Delhi*, October 19, 2022. https://pib.gov.in/PressReleasePage.aspx?PRID=1869080.
13. South Korean policymakers are now seeking to abolish the mandatory offset requirement. This is the logical next step following the collapsing value of defence countertrade since 2016. In the five-year period from 2016 to 2020, Korea purchased over USD 10 billion worth of foreign weapons but demanded just seven percent (about USD 700 million) of that figure in offset trade. This represents a nosedive from the USD 8 billion in offsets secured in the preceding five-year period (2011 to 2015). See, Jang Won-Joon and Park Hea, July 2023.
14. This will prove a challenge, however, given that in 2022, Saudi Arabia's foreign military sales amounted to just US$185,000, achieved through offset-related OEM commitments to the US, and tiny sales to Czechia, Finland, Bahrain, and New Zealand. See, OEC (2024).
15. The health of the Saudi economy is due in large part to the inelastic demand for its oil resources, notwithstanding Riyadh's successful economic diversification efforts. As part of the Vision 2030 framework, the government is working hard to reduce its high level of dependence on oil. In 2024, oil revenue accounted for just over 30% of the Kingdom's GDP, and following the implementation of numerous diversification initiatives, the oil GDP share is expected to have declined further to between 24-26% by 2030. See, Farraj (2024).
16. See Table 1. For example, the share of UK acquisition cost in its 2022 defence budget was 22%. See, House of Commons Library (2019).
17. The remarkable arms trading performance of Turkey would not have gone unnoticed, highlighting that the challenges of localisation are not insurmountable. Through institutional commitment, judicious planning, and meaningful cooperative acquisition, offset, and R&D, Riyadh could emulate the defence industrial achievements of Turkey. The latter's push for self-reliance is indeed instructive. Since the 1960s, Ankara has pursued a defence localization strategy that has provided the basis for dramatic reductions in import dependence. As Table 2 highlights, in 2023, Turkey's arms imports were just US$93mn, the second lowest among the world's leading defence nations. Turkey has also enjoyed robust export growth, with foreign arms sales surging by 106% between 2014-18 and 2018-22, making it the 11th biggest arms exporter among the 66 states SIPRI documents as arms exporters. See, Turkish Minute (2024).
18. Within defence, a further 11 industrial capability targets were announced that included the manufacture of UAV platforms and structural components, cyber security, defence electronics, munitions and guided weapons manufacture.
19. See, Czulda (2024). An ambitious goal, albeit that localisation refers to domestic defence production in KSA, irrespective of ownership.
20. Email correspondence, Eng. Turki Alajmi, KSA Defense Industries Advisor, December 18, 2024.
21. Email correspondence, Eng. Turki Alajmi, KSA Defense Industries Advisor, December 18, 2024.
22. Email correspondence, Eng. Turki Alajmi, KSA Defense Industries Advisor, December 18, 2024.
23. Email correspondence, Eng. Turki Alajmi, KSA Defense Industries Advisor, December 18, 2024. Significantly, Riyadh has already posited its ambitious aim of future arms exports accounting for 30% of defence business. See, Czulda (2024).
24. Email correspondence, Eng. Turki Alajmi, KSA Defense Industries Advisor, December 18, 2024.
25. This Saudi company has an interesting history, including an aborted 2015/16 programme to produce in-country Ukrainian Antonov AN-132 heavy lift aircraft. See, Venckunas (2021).
26. Note also that the Ministry of Investment also plays an interventionist approach towards localization. It has the power to mandate entries into the JV's Articles of Association, and from January 2024, foreign business activities with the Saudi government would be constrained unless their regional headquarters are in Saudi Arabia. The Ministry also publishes and

periodically reviews a 'negative' list of business functions that foreign companies are prohibited from undertaking in Saudi Arabia, due to low value-added contribution.

27. Gaining the license represents an important step forward in securing greater supply sovereignty, which has been hindered in recent years due to Germany's sensitivities over Saudi Arabia's military engagement in the Yemen conflict. This license award was followed a year later by the Al Yamamah offset company, MEPC, announcing it had signed an agreement with Rolls-Royce to provide repair and overhaul services on the Typhoon's EJ200 turbofan engine.
28. Significantly, some 85% of AEC's workforce has been Saudised, see Forrester (2020b).
29. These additional costs can be as high as 30% of the primary defence contract but are unavoidable in efforts to progress indigenous defence industrialisation. In the long run, the cost premium can be eroded once the industry matures and learning efficiencies are introduced. See, Matthews and Ansari (2015).
30. See, Neumann (2024) and Hoyle (2024). The Saudi armed forces currently operate more than 400 Boeing-built aircraft, backed by training, support, and sustainment services. Note, the Typhoons could quickly be assembled at the King Faisal Air Base, Tabuk, especially now that RSAF Hawk assembly has finished, and the facility hosts accumulated engineering capability from the earlier Tornado sustainment programme upgrades. See, Times Aerospace (2024).

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Ethics approval

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