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Offset Implementations for Turkey's International Defense Acquisitions

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"Offsets" is the umbrella term for a broad range of industrial and commercial "compensatory" practices. Specifically, offset agreements in the defense environment are increasing globally as a percentage of exports. Developed countries with established defense industries use offsets to channel work or technology to their domestic defense companies. Countries with newly industrialized economies are utilizing both military and commercial related offsets that involve the transfer of technology and know-how. Overall, offsets are definitely not new, and occur under a variety of names. In the defense industry it is now an accepted practice among both sellers and purchasers, and is likely to remain so for the indefinite future. This research will discuss defense offsets within the context of international trade and global arms trade. This discussion will draw upon the existing body of theory and practice on offsets (as identified in the literature review) to provide a basic understanding of offsets within the wider international trade context. The offset policies of selected countries will be analyzed prior to exploring the development of Turkish offset policy. Additionally sample defense acquisition programs will be examined as case studies to explain the incentives within Turkish offsets and to suggest future offset policies

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OFFSET IMPLEMENTATIONS FOR TURKEY'S INTERNATIONAL DEFENSE ACQUISITIONS

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OFFSET IMPLEMENTATIONS FOR TURKEY'S INTERNATIONAL DEFENSE ACQUISITIONS

ABSTRACT

"Offsets" is the umbrella term for a broad range of industrial and commercial "compensatory" practices. Specifically, offset agreements in the defense environment are increasing globally as a percentage of exports. Developed countries with established defense industries use offsets to channel work or technology to their domestic defense companies. Countries with newly industrialized economies are utilizing both military and commercial related offsets that involve the transfer of technology and know-how. Overall, offsets are definitely not new, and occur under a variety of names. In the defense industry it is now an accepted practice among both sellers and purchasers, and is likely to remain so for the indefinite future. This research will discuss defense offsets within the context of international trade and global arms trade. This discussion will draw upon the existing body of theory and practice on offsets (as identified in the literature review) to provide a basic understanding of offsets within the wider international trade context. The offset policies of selected countries will be analyzed prior to exploring the development of Turkish offset policy. Additionally sample defense acquisition programs will be examined as case studies to explain the incentives within Turkish offsets and to suggest future offset policies.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFTA	ASEAN Free Trade Area
AII	Australia Industry Involvement Program
ALGS	Autonomic Logistic Global Sustainment
AMSL	Airbus Military Sociedad Limitada
ASEAN	Association of Southeast Asian Nations
ASTOVL	Advanced Short Takeoff And Vertical Landing
BDMA	British Defense Manufacturers Association (UK)
BIS	Bureau of Industry and Security (U.S.)
CDP	Concept Demonstration Phase
CMP	Commissariat for Military Production (Netherlands)
CTOL	Conventional Take-Off and Landing
DARPA	Defense Advanced Research Projects Agency (U.S.)
DESO	Defense Export Services Organization (UK)
DIIRS	Defense Industry Investment Recognition Scheme (Australia)
DIS	Defense Industrial Strategy (UK)
DMO	Defense Material Organization (Australia)
DoD	Department of Defense (U.S.)
DPA	Defense Procurement Act (U.S.); Defense Procurement Agency (South Korea)
EADS	European Aeronautic Defense and Space Company
EU	European Union
FMS	Foreign Military Sales
GAO	General Accounting Office
GPA	Agreement on Government Procurement
GATT	General Agreement on Tariffs and Trade
ICA	Industrial Cooperation Agency (Israel)
ICP	Industrial Cooperation Program (Czech Republic)
IMF	International Money Fund

IP/O	The Industrial Participation/Offsets
JAST	Joint Advanced Strike Technology
JSF	F-35 Joint Strike Fighter
MFN	Most Favored Nation Treatment
MOD	Ministry of Defense
MOU	Memorandum of Understanding
MRF	Multi-Role Fighter
MTS	Multilateral Trading System
NAFTA	North American Free Trade Agreement
NATO	North Atlantic Treaty Organization
OCCAR	Organisation Conjointe de Coopération en Matière d'Armement– Organization for joint Armament Cooperation
PSFD	Production, Sustainment, and Follow-On Development
RFP	Request for Proposal
RMA	Revolution in Military Affairs
ROI	Return on Investment
RTA	Regional Trade Agreements
R&D	Research and Development
SDD	System Development and Demonstration
SIPRI	Stockholm International Peace Research Institute
SME	Small and Medium Sized Enterprises
SSM	Savunma Sanayii Müsteşarlığı (Turkish acronym for UDI)
STOVL	Short Take-off and Vertical Landing
TAI	Turkish Aerospace Industries
TAF	Turkish Armed Forces
TBMM	Türkiye Büyük Millet Meclisi (Turkish Parliament)
TCA	Trade in Civil Aircraft
TEI	Tusas Engine Industries
TUAF	Turkish Air Force
UAE	United Arab Emirates

UDI	Undersecretariat for Defense Industries (Turkey)
UK	United Kingdom
UOG	UAE Offset Group
U.S.	United States
UTFT	Undersecretariat of Treasury and Foreign Trade (Turkey)
WTO	World Trade Organization
WMD	Weapons of Mass Destruction

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I. INTRODUCTION

A. PURPOSE

The purpose of this study is to enhance understanding of offsets in the context of defense related international trade, offsets in major Turkish weapon system acquisitions and Turkey's current policy on offsets. In particular, the offset literature will be discussed in the wider context of international and reciprocal trade. After first reviewing and discussing the offset literature, this study will examine the offset policies of selected countries to provide useful background information. Additionally, the development of the Turkish offset policy in historical context and the current policies will be explored. Finally, selected Turkish programs with offsets will be analyzed, with a view to understanding incentives involved, as well as the experience gained by Turkey in those cases. Finally, the study will offer a view of the nature of Turkish offsets policies in the future.

B. BACKGROUND

"Offsets" is the umbrella term for a broad range of industrial and commercial "compensatory" practices. Specifically, offset agreements appear to be common in large defense sales, such as of aircraft, radars, and other electronic systems, and are increasing as a percentage of worldwide exports. Basically, a buyers' market (with increasing competition among suppliers in a reduced global defense market with declining military budgets) has increased the frequency and size of offset agreements. Developed countries with established defense industries use offsets to channel work or technology to their domestic defense companies. Countries with newly industrialized economies utilize both military and commercial offsets that involve transfer of technology and know-how. Policymakers in the buying nations can use the offset agreements to address a variety of domestic economic and political issues. The desired effects are generally identified as: labor market corrections, promotion of capital investment, support for strategic industries, adjustments for asymmetric information, reduction of risk and uncertainty,

alternative sources of financing, and political support for defense purchases. Overall, offsets continue to be an important and necessary factor in defense contracts.

Most significantly, Turkey was involved in offsets intended to minimize deficits in the balance of payments with the contract for co-production of F-16 aircraft locally in 1984. With the establishment of the Undersecretariat for Defense Industries (UDI) in 1985 – better known by its Turkish acronym of SSM, the new organization also became responsible for the export of defense industrial products and for the coordination of offsets. A meeting held in March 1990 at the Undersecretariat of Treasury and Foreign Trade (UTFT), resulted in the creation of an 'Offset Commission' under the coordination of SSM to determine Turkish offset policy. Another result of the meeting was preparation of the first 'SSM Offset Guidelines,' in July 1991. The guideline has been amended two times (in 2003 and 2007). As of 31st December 2007, the number of contracts signed by SSM totaled 77, with U.S.$6.94 Billion committed. To date, 22 of the offset contracts awarded by SSM have been successfully completed. The remaining 55 are still in effect and continue to be executed.

C. THESIS OBJECTIVES

The objective of this research is to provide an extensive review of offsets in the international defense marketplace, particularly with respect to their effects on Turkey. Offset literature will be discussed within the wider system of global defense trade. This study will also examine the offset policies of selected countries. Additionally, the development of the Turkish offset policy in historical context and the current policies will be explored. Selected Turkish programs with offsets will be analyzed, with a view to understanding incentives involved, as well as the experience gained by Turkey in those cases to provide a well-informed prediction of future directions in Turkish offset policies.

D. RESEARCH QUESTIONS

1. Primary Research Question

What is Turkish offset policy – its current state and preferred direction of future development?

Secondary Research Questions

- Identify the offsets and their international use.
- Identify the offset policies of selected countries.
- Identify the history and development of offsets in Turkey and current offset policy.
- Analyze selected offset projects of Turkey.
- Discuss alternate future offset policies in Turkey

E. SCOPE

This research will discuss offsets within the context of international trade and global arms trade. This discussion will use the existing body of theory and practice on offsets (as identified in the literature review) to provide a basic understanding of offsets within the wider reciprocal trade context. The offset policies of selected countries will be analyzed prior to explore the development of Turkish offset policy. Additionally sample defense acquisition programs will be examined as case studies to explain the incentives posed and future trends. The study will use publicly available data.

Offsets may be used for commercial practices. However, this study will be limited to those occurring as a result defense procurements. Countries have various motives for demanding and providing offsets. This research will address these incentives, but not in detail. The scope of the study will be limited to review and discussion of the offset literature, combined with policies and cases to derive general conclusions and recommendations. The study will not attempt to determine or evaluate the real impact of

using offset practices on macroeconomies (employment, balance of payments, …) defense industrial base, defense preparedness, competitive advantage, arms proliferation or national security.

F. METHODOLOGY

The methodology of this research will be limited to literature review related to offsets and international trade as well as a review of offset related documents produced by Turkey, other subject countries and international organizations such as World Trade Organization (WTO). Turkish Government documents include the unofficial translation of the offset guidelines issued and revised over a period of time.

Selected major weapon system projects of Turkey will be basis for case analysis to enhance the understanding of Turkish offset policy.

G. ORGANIZATION OF STUDY

Chapter II essays an empirical overview of offsets within international trade, including the arms trade. Since offsets are closely tied trade policy, international trade theory and policies are introduced. Reciprocal trade agreements are introduced as the international trade system practices to establish a framework for understanding the offsets related to arms trade. Before discussing offsets in detail, the main characteristics of the arms trade and the recent developments in arms trade environment are outlined. Finally, the terms and conditions, reasons and arguments for offsets are discussed. With the background provided, the distinction of the defense offsets within the wider context of the reciprocal trade is warranted.

Chapter III reviews the offset policies and their implementation in selected countries. Every country has different objectives to pursue (e.g., emphasis on improving industrial base or technology transfer) and these objectives may change over time — depending in part on the experience from previous offsets. Studying and understanding other countries' rationale for offsets, as well as their policies and methods for implementation provides useful information for developing offset policies for countries like Turkey

Chapter IV starts with overview of the Turkish defense industry and summarizes the history of Turkish offset applications in context of established organizations, published documents and policies of Turkey. Besides the presentation of development of Turkish offset policy, the evaluation of the official offset regulations published by SSM is warranted. Finally, the present and future outlook of Turkish offset applications will be discussed.

Chapter V is based on case analysis of selected major weapon procurement projects (out of 22 completed, 55 ongoing projects involving offsets) in order to enhance the understanding of Turkish offset policy. Key facts, benefits and experiences gained will be emphasized in each case analysis. Basically, F-16, A400M and JSF projects are studied in the context of reflecting past, present and future approaches towards defense industry and offset policies.

Chapter VI provides a summary and conclusions regarding Turkish offset policy; its current state and preferred direction of future development. To that end, this chapter addresses an overall summary of the offset literature and their international use, offset policies of selected countries when appropriate, history and development of Turkish offset policy and analysis of the selected Turkish major weapon system acquisitions, in light of the information presented from Chapter II through IV. The summary concludes with areas for further research.

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II. REVIEW AND ANALYSIS OF OFFSET LITERATURE

A. OVERVIEW

"Offsets" applies to a broad range of industrial and commercial "compensatory" practices required of foreign suppliers as a condition of purchase in either government-to-government sales, or commercial sales under foreign public agency procurement programs.(Pompiliu, undated) This report will delineate Turkish offset methods. Therefore, we will limit our discussion to offsets occurring as part of defense-related acquisitions. However, offset regulations have complicated structures – affecting and influenced by various stakeholders. To provide a better understanding of offsets, international trade structure including basic definitions, free trade principles and reciprocal trade agreements; and major characteristics of international defense marketplace are introduced.

B. INTERNATIONAL TRADE: THEORY AND PRACTICE

Trade can be basically defined as the exchange of goods, services, or both (commerce). While the primitive method for trade was barter, money is used in today's world as a medium to facilitate exchange. The institution that allows trade is called a market, which, to some degree, drives the trading parties to formulate specific trade policies. It is essential to understand the principles of trade as much as possible for people who have concerns about trade related issues, such as offsets. Trade that takes place between the nations is called international trade. There are many reasons for the existence of international trade.

1. Reasons for International Trade

Economists Lieberman and Hall define the comparative advantage and opportunity cost, specialization and exchange as a basis for the logic of international trade theory.

a. Opportunity Cost and Comparative Advantage

Opportunity cost refers to what is given up when taking an action or making a choice. All economic decisions made by individuals or society are costly. The correct way to measure the cost of a choice is its opportunity cost — that which is given up to make the choice (Lieberman and Hall, 2005, p. 28).

Comparative advantage refers to the ability to produce a good or service at a lower opportunity cost than other producers. Mutually beneficial trade between any two countries is possible whenever one country is relatively better at producing a good than the other country is. Being relatively better means having the ability to produce a good at a lower opportunity cost-that is, at a lower sacrifice of other goods foregone (Lieberman and Hall, 2005, p. 566).

The reasons for the existence of comparative advantage and accordingly international trade can be diverse. According to Professor Suranovic (2003) there are five basic reasons why trade may take place between the nations. They are that international trade occurs as a result of differences in technology, differences in resource endowments, differences in demand, existence of scale in production, existence of government policies.

Technology refers to the techniques used to turn resources (labor, capital, land) into outputs while resource endowments are the skills and abilities of a country's workforce, the natural resources available within its borders (minerals, farmland, etc.), and the sophistication of its capital stock (machinery, infrastructure, communications systems). (Suranovic, 2003) It is obvious that all the countries do not have the same level of technology and resources. These differences may create advantageous trade of either resources or end items between the countries. On the other hand, overall demand differences deriving from the diverse requirements of different nations, cost advantages as a result of "increasing returns to scale" and government tax/subsidiary programs can be sufficient to generate comparative advantage and trade between the nations.[1] Each of

[1] For more discussion of these issues see International Economics Study Center web site: http://internationalecon.com/Trade/Tch30/T30-0.php. (Accessed September 2008).

these issues, especially the technology and resource endowments are the basis to explain why comparative advantage emerges in the production of goods and services.

Comparative advantage is certainly related to the capital and resources each nation has at its disposal. However, it is not easy to explain why each specific case of comparative advantage arose in the first place. Countries often develop strong comparative advantages in the goods they have produced in the past, regardless of why they began producing those goods (Lieberman and Hall, 2005, p. 577, emphasis in original).

b. Specialization and Exchange

Specialization refers to the method of production in which each person concentrates on a limited number of activities. Specialization and exchange enables us to enjoy greater production and higher living standards than would otherwise be possible. As a result, all modern economies exhibit high degrees of specialization and exchange.

2. International Trade Structure

a. Market Structures

Market is a social institution that facilitates trade. Market structure is a term that encompasses all the characteristics of a market that influence the behavior of buyers and sellers when they come together to trade (Lieberman and Hall, 2005, p. 197). The four basic types of market structures are perfect competition, monopoly, monopolistic competition and oligopoly.

Perfect competition exists when there are many buyers and sellers, the product is standardized, and sellers can (relatively) easily enter or exit the market. The number of buyers and sellers is so large that no individual decision maker can significantly affect the price of the product by changing the quantity it buys or sells (Lieberman and Hall, 2005, p. 198.)

Monopoly involves only one seller (and many buyers) for a product with no close substitutes. The continued existence of a monopoly can be explained by barriers

to other firms entering the market such as economies of scale, legal barriers, and network externalities. The monopolistic firm sets the market price.

Most markets are neither monopolistic nor purely competitive. They lie somewhere between two: imperfect competition. We can classify monopolistic competition and oligopoly as types of imperfect competition. In monopolistic competition, there are many firms selling products that are differentiated, yet are still close substitutes, and in which there is free entry and exit (Lieberman and Hall, 2005, p. 248).

Oligopoly refers to the market structure in which only a few large firms dominate the market. A small number of strategically interdependent firms produce the dominant share of output in the market (Lieberman and Hall, 2005, p. 198). Reputation as a barrier, strategic barriers and legal barriers are among the reasons oligopolies develop and continue.[2]

b. Government Policies and Tools on International Trade

Governments interfere in international trade to pursue national interests. The extent and the method of intervention are therefore determined by national policies.

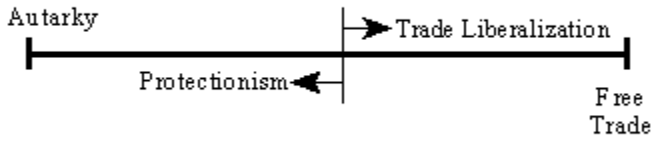

Figure 1. International Trade Policies (From Suranovic, 2003, p. 5-4)

[2] Monopsonic and oligopsonic market structures also relate to imperfect competition. In monopsonic competition, there are several sellers and only one buyer. Several buyers and a group of buyers exist in the oligopsonic market structure. Defense industries tend to have a monopsonic nature.

Two extreme states could potentially be created by national government policies. At one extreme, a government could pursue a "laissez faire" policy with respect to trade and thus impose no regulation whatsoever that would impede (or encourage) the free voluntary exchange of goods between nations. We define this condition as free trade Suranovic, 2003). The other extreme points the autarky that government eliminates all incentives for international trade, and may actually forbid such trade.

A pure state of free trade or autarky has never existed in the real world. All nations impose some form of trade-limiting policies. And probably no government has ever had such complete control over economic activity as to eliminate cross-border trade entirely (Suranovic, 2003).

Transition to free trade involves government policies to promote free trade, and can be classified as “trade liberalization.” At the same time, protectionist movements toward autarky will end up with isolation (as an extreme case).

Imports and exports are the basic flows of international trade. Imports refer to the goods or services those produced abroad, but consumed domestically. On the other hand, exports refer to the goods or services those produced domestically, but sold abroad. Governments interfere with free international trade by resorting to restrictive measures intended to achieve national objectives. These measures are chiefly (1) tariffs, which impose a tax or customs duty on merchandise crossing the boundaries of the nation, and (2) quantitative restrictions, which, by means of quotas or exchange control or a combination of both, limit the physical quantities or value of the goods that may be exported or imported (Kramer, d’Arlin and Root, 1959, p. 198).

c. International Trade Agreements

The World Trade Organization (WTO) is the institutional body dealing with the rules of trade between member nations, on a nearly global scope. The main emphasis is on avoiding trade barriers between countries and promoting free trade. Essentially, the WTO is a place where member governments go, to sort out the trade problems they face with each other (WTO, 2007, p. 9). The WTO was established in 1995 and has 152 member countries as of June 2008. Before this date, there was not an

organization dealing with international trade regulations; General Agreement on Tariffs and Trade (GATT) which is a set of rules agreed upon by nations was the norm from 1948 to 1995. The starting point of GATT was efforts to structure the international economy after World War II. WTO was established on the basis of GATT rules and it has taken the functions of GATT as an international organization dealing with trade issues on multilateral and plurilateral basis.

WTO describes the term multilateral framework involving most major trading nations. Plurilateral agreements, on the other hand, are negotiated by member countries on a voluntary basis. The plurilateral agreements in GATT were amended in the negotiations and turned into multilateral commitments accepted by all WTO members (WTO, 2007, p. 17). Currently, Agreement on Government Procurement (GPA) and Agreement on Trade in Civil Aircraft (TCA) are the only two remaining plurilateral agreements.

Regional trade agreements (RTA) are another concern within the context of international trade agreements. According to the WTO, regionalism is described in the Dictionary of Trade Policy Terms, as "actions by governments to liberalize or facilitate trade on a regional basis, sometimes through free-trade areas or customs unions". North American Free Trade Agreement (NAFTA), European Union (EU), ASEAN Free Trade Area (AFTA) are some of the main RTAs (among the 380 reported to WTO as of July 2007). According to WTO, RTAs can complement the multilateral trading system (MTS); however, the discriminatory structure of RTAs may create risks for the multilateral framework.[3]

Turkey has been a WTO member since 1995 and has observer status on GPA within WTO. At the same time, Turkey is party to various bilateral and regional Trade agreements.[4]

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[3] For a detailed definition and discussion of these of these issues see Regional Trade Agreements on WTO web site: http://www.wto.org (Accessed 3 September 2008).

[4] See Bilateral and Regional Trade Agreements of Turkey on WTO web site: http://www.wto.org/english/tratop_e/region_e/region_e.htm#analysis_publications (Accessed 3 September 2008).

3. Principles of Free Trade

According to WTO, there are five main principles on the foundation of MTS:

a. Without Discrimination

Under the WTO agreements, countries cannot normally discriminate between their trading partners. Granting someone a special favor (such as a lower customs duty rate for one of their products) entails an obligation to do the same for all other WTO members. This principle is known as most-favored-nation (MFN) treatment. Imported and locally produced goods should be treated equally — at least after the foreign goods have entered the market (WTO, 2007, p. 10).

b. Freer Trade

Lowering trade barriers is one of the most obvious means of encouraging trade. The barriers concerned include customs duties (or tariffs) and measures such as import bans or quotas that restrict quantities selectively. From time to time, other issues such as red tape and exchange rate policies have also been discussed (WTO, 2007, p. 11). However, freer trade is not always beneficial for everybody. Therefore, developing countries usually have exceptional statues in order to fulfill their obligations under the multilateral and plurilateral agreements.

c. Predictable

With stability and predictability, investment is encouraged, jobs are created and consumers can fully enjoy the benefits of competition — choice and lower prices. The multilateral trading system is an attempt by governments to make the business environment stable and predictable (WTO, 2007, p. 11). The binding commitment of each party is an attempt to provide predictability and stability for international trade.

d. Promoting Fair Competition

WTO defines itself as a system of rules dedicated to open, fair and undistorted competition rather than a just a “free trade” institution. In this context, the system may allow tariffs and, in limited circumstances, other forms of protection.

e. Encouraging Development and Economic Reform

WTO, being an international negotiation forum in its nature, establishes the opportunity for development through economic reforms. However, developing countries and countries in transition to market economies need flexibility in order to implement the required regulations of free trade.

4. Reciprocal Trade Agreements

Terminology has been a source of confusion in the field of offsets and countertrade (Schmidt, 1989, p. 4) Compensatory trade agreements — or reciprocal trade — are another aspect of the modern international trade structure. And, while the terms may be defined in different forms, they are usually used as complementary policy instruments. Countertrade and offset terms have usually been overall terms to define and classify reciprocal trade agreements. However, there is not a universally agreed definition of these terms to date. This is mainly due to the complex and dynamic nature of reciprocal trade. On the other hand, most of the literature in this field concludes reciprocal trade agreements in both commercial and defense markets have different motives and characteristics in nature.

Author Grant T. Hammond classifies reciprocal trade as countertrade, offsets and barter — which involve all aspects of international political economy. They involve exchange of goods, services, technology, investments, money, people and knowledge of all kinds. Those involved are limited only by their own creativity in putting together these complicated deals. Everything from agricultural commodities and advertising to military equipment and strategic resources is involved in compensatory arrangements (Hammond, 1990, p. 4).

First, countertrade refers to reciprocal and compensatory trade agreements involving the purchase of goods or services by the seller from the buyer of his product, or arrangements whereby the seller assists the buyer in reducing the amount of the net cost of the purchase through some form of compensatory financing. It generally refers to civilian, not military, arrangements. Second, offsets are compensatory, reciprocal trade agreements for industrial goods and services as a condition of military-related export sales and services. Some authors use "offset" as an umbrella term for overall reciprocal trade. However, the term is so ensconced in the aerospace/defense sector that Hammond treats it as a separate entity. Finally, barter is a one-time only exchange of goods or services of equivalent value specified in one contract, without the use of money. In addition to these broad categories, there are several other, more detailed terms — such as bilateral clearing, coproduction, counterpurchase, overseas investment, technology transfer, import compensation, switch trading and evidence accounts[5]-which may be subsumed under one or other of the three main classifications above (Hammond, 1990, p. 7, emphasis in original).

WTO approaches the countertrade with skepticism, because it generally distortss international markets. This skepticism is particularly valid in situations where the true value of the transactions is difficult (or impossible) to establish. Nonetheless, the arms trade is excluded from both multilateral and plurilateral agreements

In essence, the terms reciprocal trade, countertrade and offsets are generally synonymous. However, meanings may differ on case basis. Theoretically, either "countertrade" or "offset" may be an umbrella term for reciprocal trade, but in practice

[5] Bilateral clearing: These are essentially government-to-government trade agreements whose purpose is to achieve a balance in international trade accounts with each other. Coproduction: This is an agreement for a government or producer to acquire the technical information required to produce a certain product or component. These are generally government-to-government agreements or between a government and a private manufacturer. Counterpurchase: This is an agreement whereby the initial exporter buys or undertakes to find a buyer for a specific amount or value of unrelated goods from the initial importer during a specific time period. Overseas investment: A way for the purchasing party to increase investment, create jobs and stimulate the domestic economy even when making foreign purchases. Technology transfer: This refers to the transfer of technology mandated as part of a countertrade or offset agreement, other than coproduction or licensed production. Import compensation: This is an agreement whereby the initial exporter agrees to accept output in full or partial payment. Switch trading: This is a process whereby one party to a countertrade agreement sells discounted purchase options to the goods or services for which he originally contracted to a third party who must then complete the obligation. Evidence accounts: These arrangements involve the sales and purchases from an agreed-upon list. (Hammond, 1990, p. 10).

offsets are the norm in military reciprocal trade. This report will discuss offsets in more detail within this chapter. Considering that offsets occur more frequently in defense related, high technology products, we will define the characteristics of the defense industry and the current arms environment before addressing offsets in detail.

C. THE INTERNATIONAL ARMS TRADE

1. Defense Market Structure

At its basic level, the arms trade concerns the acquisition and maintenance of national security by nation-states. In most cases, this security has been achieved primarily through development of military capability. This capability comes in the form of military equipment and support, and it can be either indigenously produced or imported from another supplier (a commercial firm or a country) via international trade. Through the years, a host of terms have been used to describe this international phenomenon: arms transfers, arms trade, military and/or security assistance, military cooperation, and so forth (Laurence, 1992, p. 3.)

While the economic principles of international trade, such as comparative advantage, opportunity cost, specialization and exchange, are a useful starting point for an observer of international arms trade, there is a substantially different, more ambiguous and complex structure of products and players.

The arms trade is something different from “normal” trade in other commodities because of their political significance, which arises from several factors. A first point is that arms – and arms transfers – are closely related to security, one of the most basic goals of states. A second reason is that arms transfers are often perceived as gestures of political support transcending the purely military utility. The political significance of arms transfers is further reinforced by their impacts on the global distribution of military capabilities (Catrina, 1988, p. 12).

Table-1 presents some examples where defense marketplace characteristics differ from the standard assumptions of free market theory. The most significant difference is the degree of government involvement. Since military capability is the main determinant

of national security, government interference is the norm in all aspects of international arms trade. Threat assessment and national sovereignty concerns are the most important factors motivating government interference in arms trade.

Free Market Theory	***Defense Market***
Many small buyers	One buyer(DoD or Ministry of Defense)
Many small suppliers	Very few, large suppliers of a given item
All items small, perfectly divisible and large in quantities	One ship built every few years, for hundreds of millions of dollars each
Market sets prices	Monopoly or oligopoly pricing-or "buy in" to "available dollars"
Free movement in and out of market	Extensive barriers to entry and exit
Prices set by marginal costs	Prices proportional to total costs
Prices set by marginal utility	Any price paid for the desired military performance
Prices fall with reduced demand	Prices rise with reduced demand
Supply adjust to demand	Large excess capacity
Labor highly mobile	Great diminishing labor mobility
Decreasing or constant returns to scale	Increasing returns to scale in region of interest
Market shifts rapidly to changes in supply and demand	7-10 years to develop an new system, then 3-5 years to produce it
Market smoothly reaches equilibrium.	Erratic behavior from year to year.
General equilibrium-assumes prices will return to their equilibrium value.	Costs have been rising at approximately 5% per year (excluding inflation).
Profits equalized across economy.	Wide and consistent profit variations between sectors; even wider between firms.
Perfect mobility of capital (money).	Heavy dept, difficulty in borrowing.
Mobility of capital (equipment) to changing demand.	Large and old capital equipment "locks in" companies.
No government involvement.	Government is regulator, specifier, banker, judge of claims, etc.
Selection based on price.	Selection often based on politics, or sole source, or "negotiation", only 8% of the

	dollars awarded on price competition.
No externalities.	All businesses working for DoD must satisfy requirements of OSHA, EEO, awards to areas of high unemployment, small business set asides, etc.
Prices fixed by market.	Most businesses, with any risk, is for "cost plus fee".
All products of a given type are the same.	Essentially, each producer's products are different.
Competition is for share of market.	Competition is frequently for all or none of a given market.
Production is for inventory.	Production occurs after sale is made.
Size of market established by the buyers and sellers.	Size of market established by third party (Congress) through annual budget.
Demand sensitive to price.	Demand "threat"-sensitive, or responds to availability of new technology; almost never price sensitive.
Equal technology throughout industry.	Competitive technologies.
Relatively stable, multiyear commitments.	Annual commitments, with frequent changes.
Benefits of the purchase go to the buyer.	A "public good".
Buyer has the choice of spending now or saving for later purchase.	DoD must spend its congressional authorization.

Table 1. Some Examples of "Market Imperfections and Failures" in Defense (From Gansler, 1980, p. 30)

If some conditions for the traditional free market (the "first best") do not apply and cannot be created, then creating some additional free market conditions or moving more in the direction of free market conditions may actually result in reduced efficiency in the allocation of resources. Since it is clear that in the case of defense industry some of the constraints to free-market operation cannot be removed, it follows that all policy actions in the defense sector must be made with the "theory of the second best" clearly in mind (Gansler, 1980, p. 29).

"Theory of the second best" that Gansler describes might be highly subjective depending on the cyclical nature of the international defense industry. The ambiguous

nature of the threat assessment enforces the cyclical nature of the arms trade, while the dependence on international arms trade is perceived as "bad" and national sovereignty, regardless of economic realities, should somehow be protected.

2. Arms Trade Environment

Measuring the value and content of arms transfers is extremely difficult – even legal, conventional transactions. First, there are problems of secrecy. Although it is hard to conceal for the long transfer of major arms systems such as tanks or combat aircraft, the precise value of deals and exact quantity of equipment can be disguised. Second, there are definitional issues. It is not just a matter of deciding what sorts of military equipment should be included, in a spectrum of running from uniforms, through trucks, four-wheel drive vehicles, radios, reconnaissance aircraft and transport helicopters to rifles, fighter aircraft and missiles. There is also the issue of whether to include the value of training packages and other elements such as civil engineering and construction in arms deals (Taylor, 1994, p. 97.) Fortunately, the observer of the defense offsets can focus on trends rather than the exact numbers.

According to the Stockholm International Peace Research Institute (SIPRI) Yearbook (2008), world military expenditure is estimated to have been $1339 billion in 2007—a real-terms increase of 6 per cent over 2006 and of 45 per cent since 1998[6].

[6] See SIPRI web site for the list of the items constituting the base for the military spending estimates.

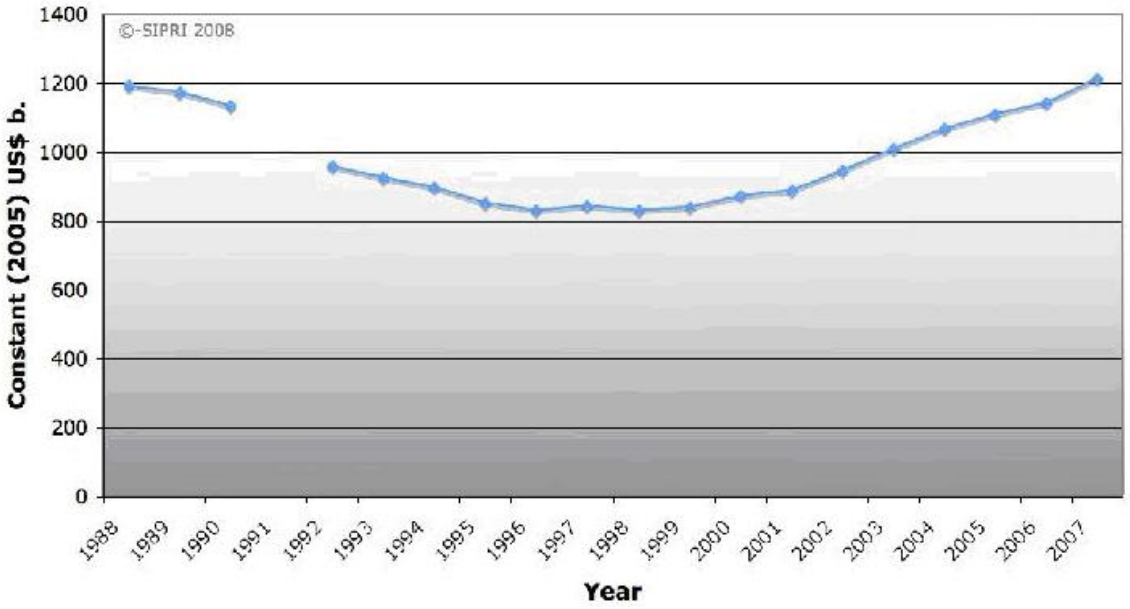

Figure 2. World Military Expenditure, 1988-2007 (From SIPRI Yearbook 2008)[7]

Figure-4 shows the total military expenditure in the world from 1988 to 2007. Another report that Congressional Research Service (CRS) published at 2007 states that during the period of 1999-2006, conventional arms transfer agreements (which represent orders for future delivery) to developing nations comprised 66.4% of the value of all international arms transfer agreements worldwide. The portion of agreements with developing countries constituted 65.7% of all agreements globally from 2003-2006. Statistics on world military spending may vary, among available sources, depending on the data obtained by the researchers. Latest trends on military spending, and arms trade, can be interpreted based on two major facts: the revolution on military affairs (RMA) and globalization.

a. Revolution in Military Affairs (RMA)

Based upon an assessment of the outcomes of what have been defined as RMAs in the past, a revolution in military affairs occurred when one of the participants in

[7] Some countries are excluded because of lack of data or consistent time series data. World totals exclude Angola, Cuba, Equatorial Guinea, Guyana, Haiti, Myanmar, North Korea, Qatar, Somalia, Trinidad and Tobago and Viet Nam.

a military competition incorporates new technology, organization, and doctrine to the extent that victory is attained in the immediate instance, but more importantly, that any other actors who might wish to deal with that participant or that activity must match, or counter the new combination of technology, organization, and doctrine in order to prevail. The accomplishments of the victor become the necessary foundation for any future military activities in that area of conflict (Galdi, 1995).

Contemporary military affairs illustrate rapid changes in both military technology and the art of war. That is, new technologies and methods are not merely changing wars, but changing the ways wars are fought. The ongoing Revolutions in Military Affairs (RMAs) have both created new military competencies for successful innovators and decreased significantly the operational effectiveness of previous methods (Franck, Lewis and Udis, 2008, p. 4). RMAs change the requirements of the armed forces leading to reforms in acquisition policies of the governments and also changes in the defense industry. However this is likely to happen in the long run.

Information-age warfare is the term describing the major points of the nearly global RMAs especially after the end of Cold War. Some of the major points of this RMA are summarized below[8]:

- Improvements in computers and electronics making possible major advances in weapons and warfare, such as the networking of information, communications, platforms, weapons, warriors, and more, to permit greater speed of decision-making
- Radically more capable sensors, making the battlefield "transparent"
- Platforms—whether land, sea, or air—becoming lighter, more fuel efficient, faster, and stealthier, and capable of very rapid deployment and enormous lethality

[8] See "Recent Trends in Thinking About Warfare" on http://www.cna.org/documents/d0014875.a1.pdf for more discussion of these issues (By Albert A. Nofi, Accessed 8 September 2008).

- Technologically different types of weaponry becoming available, such as space-based systems, directed energy weapons, and advanced biochemical agents.

Changes in methods of warfare have, not surprisingly, implications for defense industries (Franck, Lewis and Udis, 2008, p. 12). Increasing complexity of the military hardware has created new players in the global defense industry. More companies, whether main or subcontractors, are likely to take role in defense contracts. Combined with the effects of globalization, this makes arms trade more competitive and important for the firms.

b. Globalization

"Globalization" is perhaps the most popular term used to describe changes in the international environment since the end of the Cold War (Guay, 2007, p. 1). International Money Fund defines the globalization as the growing economic interdependence of countries worldwide through the increasing volume and variety of cross-border transactions in goods and services and of international capital flows, and also through the more rapid and widespread diffusion of technology.

The global arms trade is not governed by WTO rules, since a country cannot be prevented from taking actions that it considers necessary for the protection of its essential security interests. But the same forces of globalization that have facilitated the trade of commercial goods and services — multinational supply chains, complex transportation logistics, penetration of new markets, and innovative financing — also have helped the weapons industry (Guay, 2007, p. 49).

Globalization, by definition, increased the volume of trade between nations. While a major cause of growth and prosperity, expanding international trade has, by its very nature, increased economic specialization among nations. This has proven an especially sensitive issue when interdependence means loss of self-sufficiency in military production (Franck, Lewis and Udis, 2008, p. 12.)

Globalization, in many ways, has strengthened the hand of defense companies at the expense of national governments. With more opportunities to expand their international presence, governments, at times, are being required to make concessions that would have been unheard of even a decade ago … Of course, international arms sales were present and often vital for a company's success, but exports almost were secondary, since they where a way to increase production runs, capitalize on learning from manufacturing processes for the home market, and lower overall per-unit costs. But today many companies are looking at foreign markets much sooner – or even instead of home markets (Guay, 2007, p. 64, emphasis in original.)

D. DEFINING OFFSETS

As stated earlier, the literature on offsets is complex and diversified. Despite being a global phenomenon, the terms and definitions on offsets are not consistent among the various authorities. Nonetheless, we aim to place the subsequent discussion of defense offsets within the wider context of reciprocal sales agreements. To that end, Turkish government terms, and reasons for offsets are introduced for further discussion of the issues.

1. Offset Terms and Conditions

Three conditions distinguishing an offset agreement are (a) purchasing government involvement, (b) supplier reciprocity and (c) preferential treatment.[9]. Purchasing government involvement means intervention through laws or public policy, as well as scrutiny of offset transactions during the approval processes. This may include a review of the offset arrangement to ensure that specific types of offsets (e.g., co-production versus marketing services) are pursued, or that satisfactory arrangements are made to cover instances of non-fulfillment (e.g., payment of liquidated damages). Supplier reciprocity refers to the requirements of the purchasing government that obliges the supplier to contractually provide some form of additional, secondary compensation as

[9] Three important characteristics distinguishing offsets as compensatory transactions are defined by Dr. Pompiliu Verzariu in a 2000 report and discussed in a Naval Postgraduate MBA Thesis by Joseph A. Milligan.

a prerequisite to the primary contract award. This reciprocity may be either an explicit statement or implicit understanding by a purchasing government that a contract award for goods or services will be based upon cost, schedule and performance as well as additional factors unrelated to the goods or services that the seller must provide as a condition of sale. Finally, preferential treatment refers to the privilege of the supplier as a result of agreement to provide reciprocal compensation. Preferential treatment may appear in a variety of forms, to include decreased tariffs, lower taxes, or favorable financing (Milligan, 2003, p. 10, emphasis in original).

Two other general concepts underlie offset agreements (from a more contractual side) are identified as additionality / incrementality and casuality by Marvel. The concept of additionality or incrementality requires that for an offset activity to count as offset credit, the activity must be in addition to the activity that the offset obligor is already performing in the country. For example, if the offset obligor proposes to purchase $10 million of printed circuit boards from Country X, it cannot count towards this $10 million any purchases of printed circuit boards it had already been purchasing. The other concept, casuality, requires that for an offset activity to count as offset project, the project must have been one that came about because of the offset obligor's efforts. Thus, if a third party approached an offset obligor with the opportunity to claim offset credit for establishing a plant in country X (that the third party was already going to build there), the project could not count towards the offset obligation (Marvel, May 2001, p. 14).

a. Academic Definitions

Broadly speaking, the term "offsets" is used to describe any form of reciprocal exchange that takes place within the context of arms trade (Schmidt, 1989, p. vi). The history of the contemporary reciprocal trade agreements goes back to the beginning of the century. Various forms of reciprocal trade arrangements, whether related to civil or military goods, took place to date. The form and volume of these agreements

has always been dynamic but having significant characteristics[10] due to the major global economic and political developments such as world wars, economic recessions, cold war, etc.

Offsets in international trade became ubiquitous in sales of technologically advanced equipment beginning in the late 1960s and early 1970s. (Franck, Lewis and Udis, 2008, p. 36) It is apparent that offset agreements are, in effect, a form of international trade policy or, more generally, industrial policy. Offsets arise in military aerospace industries because of the natural involvement of the governments in procuring an independent defense-industrial base. (Udis and Maskus, 1996, p. 172)

Offsets are a range of industrial and commercial practices required as a condition of the purchase of defense articles and/or defense services. (Martin, 1996, p. 31)

The most common offset agreement commits the selling firm to perform some non-market requirement as a necessary condition for the sale. Such requirements vary widely, ranging from an agreement by the seller to purchase products and/or services from the buying country essentially unrelated to the equipment sale being negotiated, to explicit transfer of technology, investment, and various co-production arrangements. (Franck, Lewis and Udis, 2008, p. 36)

As in the definition of offsets, there is not a universal classification system for offsets. The most common and general sorting is whether it is direct or indirect.

Direct offsets are concessions made in goods and services directly related to the sales item. For example, (from U.S. perspective) Turkish production of an avionics subsystem to be installed within F-16s bought by Turkey would be a direct offset. An indirect offset is unrelated to the weapons being sold — e.g., payment for arms with, say, Saudi oil. (Schmidt, 1989, p. vi)

[10] Anytime there is a crisis of sorts in the global economy, where trade is an important part of a country's economic well-being, then compensatory (reciprocal) trade agreements of one sort or another are likely to become popular. This happened in the late nineteenth century, the depression of the 1930s, the immediate post-war period of economic recovery, and in the 1970s and 1980s because of oil shocks and global recession. "In an era of illiquidity, uncertainty, and global industrial realignment, countertrade appears to be an ideal mechanism for growth. (Hammond, 1990, p. 15).

b. Turkish Government Terms

All governments purchase defense equipment and it is, therefore, hardly surprising that over 130 countries have some form of offset policy.[11] (Martin, 1996, p. 3) Countries define offsets in different forms because of different motives and expectations. At the same time these definitions are changed and/or revised within time based on the economic, political developments and the experiences countries gained.

The Turkish Government uses the terms 'Offset" and/or "Industrial Participation" in order to address defense offsets. 1991 and 2003 Offset Guidelines - prepared and revised by Undersecretariat for Defense Industries (SSM-the Turkish acronym will be used) direct that offsets/industrial participation were to be defined as defense industry related exports and any other kinds of foreign currency inflows secured pursuant to agreement in order to compensate for the foreign currency shortfalls.

In the Offset Guidelines revised in 2007, SSM defines the industry participation/offsets as activities secured in a project in order to use domestic industry capabilities, increase the competitiveness of national defense industry through exports, and constitute technologic cooperation, investment and R&D capabilities.

The same guidelines classifies the offsets in three categories: category-A, category-B and category-C. Category-A refers to goods and/or services (within the related project) to be produced domestically (Local content). Category-B refers to the export (by Turkey) of defense, aeronautic and space related goods/services, and export of goods/services related to the contract. Finally, category-C refers to the technological cooperation, new and/or expanding investment, and R&D activities related to defense, aeronautics and/or other activities requiring advanced technologies.

With regard to giving and receiving offset work, each country can be allocated to one of these three groups. First, there is the USA that largely exports equipment and thus only gives offsets … 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 … Finally, there is the large number of states that largely import defense equipment and who thus only receive offset work. (Martin, 1996, p. 4, emphasis in original) Turkey is one of the countries that fall into this category. (Ilbas, 2001, p. 35).

The concept of offsets, especially in high-tech applications such as defense and aerospace, is defined as exports and other transactions providing foreign currency inflow to compensate for associated balance of payments. Nowadays, offsets are not only used as a means to increase standards of quality and productivity in domestic industries, creating local content, and producing goods and services that are competitive in the international arena. They are also used by industrialized countries to develop their defense industries and to augment their market shares[12].

2. Reasons for Offsets

Countries have both economical and political motives for demanding and/or providing offsets. Results expected from offsets vary, depending mainly on the country's policies. Considering the majority of the countries in the world are in the "offset receiving" group and about 60% of the world military spending belongs to developing countries, offset receiving nations are generally developing countries. It's therefore reasonable to suppose that offset expectations are diverse. Developed countries with established defense industries use offsets to channel work or technology to their domestic defense companies. Countries with newly industrialized economies are utilizing both military and commercial related offsets that involve the transfer of technology and know-how. Policymakers in the buying nations can use offset agreements to address a variety of economic and political issues. The desired effects are generally identified as: labor market corrections, promotion of capital investment, support for strategic industries, adjustments for asymmetric information, reduction of risk and uncertainty, alternative sources of financing, and political support for defense purchases.

The dynamic and complex nature of offsets as an industrial tool is an essential factor to be considered while analyzing the underlying motivations of offset. Declining military budgets, the effects of the globalization on defense industries and increasing competition rendered the arms trade more critical for the major, high-technology firms and accordingly increased the bargaining positions of the developing nations – resulting

[12] See activity areas on SSM website: http://www.ssm.gov.tr/EN (Accessed 25 September 2008).

in increased use of offsets. Additionally, the ongoing RMAs brought new defense firms into the global market. Overall, reasons for offsets are continuously revised both by the developed and developing nations.

Turkey is a developing country with an emerging defense industry. The initial goal in the mid 1980s was to compensate for foreign currency shortfalls occurring as a result of defense related procurements. The revised policy in 2007 considers offsets as a tool in order to meet Turkey's strategic goals. In a more detailed expression, offsets are used to enhance the use of domestic industry capabilities, increase the competitiveness of national defense industry through exports, and constitute technological cooperation, investment and R&D capabilities.

3. Arguments for Offsets

International organizations regulating trade between nations consider reciprocal trade as limiting the gains from free trade. Since the arms trade is not governed by WTO rules, offsets have an almost sacrosanct niche. However, GPA (a plurilateral agreement between WTO members) restricts the use of offsets in other government procurements.

Another international concern about offsets is that they may increase arms proliferation. Arms proliferation is a global concern, especially for weapons of mass destruction (WMD), mines, small arms, and technically advanced weapons. Offsets can potentially accelerate this proliferation through sales, co-production, and technology transfer. (Ilbas, 2001, p. 20) However, offsets involve the legal (and registered) transfer of arms and the subject arms proliferation is therefore subject to various regulations.

Offset providers, such as U.S., have concerns about economic impacts and the scope of the technology transfers provided through offsets. However, the reports trying to sort out the economic effects of offsets-especially on employment- suggests that offsets have limited effects on the economy. Another concern is that offsets increase the cost of the contract, administrative and transaction costs — introducing overly bureaucratic rules. Nonetheless, countries demanding offsets tolerate these in pursuit of policy goals.

Overall, offsets are still an accepted practice among both sellers and purchasers alike, and are likely to remain so for the indefinite future. (Hammond, 1990, p. 84)

E. SUMMARY

This chapter sought an empirical overview of offsets within international and arms trade. Since an offset is an international transaction, international trade theory and policies are involved (even if indirectly). Before discussing offsets in detail, the main characteristics of the arms trade and the recent developments in arms trade environment are provided. Finally the terms and conditions, reasons and arguments for offsets are discussed. With the background provided, the distinction of the defense offsets within the wider context of the reciprocal trade is warranted.

The following chapters examine the offset policies in selected countries, offset policy of Turkey and analyze the selected offset programs of Turkey.

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III. OFFSET IMPLEMENTATIONS AND POLICIES IN THE WORLD

A. OVERVIEW

Developing countries, such as Turkey, who are buyers in international arms trade market, have their own motives and objectives for offsets. These motives can be:

- Acquiring new technologies and capabilities through technology transfer[13],
- Establishment of national defense industrial base,
- Increasing self-sufficiency and reducing inter-dependence,
- Reducing trade deficit,
- Easing foreign exchange shortages, (Martin, 1996, p. 19)
- Creating employment and production possibilities for domestic labor and industry, (Franck, Lewis and Udis, 2008, p. 39)
- Creating[14] and increasing competitiveness of domestic industry in global arena,
- Political concerns[15],
- Public policy issues[16]
- Alliance cohesion[17]

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[13] There is also a spillover effect of technology transfer. After initial establishment the technology will diffuse throughout the economy, stimulating economic growth. (Martin, 1996, p. 38)

[14] Offset requirements enable participants to a) sell goods, which, because of their poor quality would not normally be sold in export markets; and b) increase export of other goods through access to new markets. (Martin, 1996, p. 21).

[15] Procurement choices, particularly those involving large sums of taxpayers' money, are made in the political market place where various interest groups seek to influence decision-makers. (Martin, 1996, p. 40).

[16] Although U.S. government procurements may not be labeled as offsets, U.S. acquisition regulations function similar to the offset requirements imposed by Taiwan, Turkey, Spain, Greece, and other countries. For example, the U.S. government often requires contractors to use small, disadvantaged, minority-, and female-owned subcontractors as a condition of reward. In reality there is discernable difference between this requirement and the offset requirements of South Africa, a nation that often requires offset obligors to create projects that benefit small, micro and medium enterprises. (Marvel, May 2001, p. 13).

[17] Offsets are a method of forcing a two-way street in defense trade between the U.S. and its NATO allies. The two-way street concept is based upon the notion that alliance cohesion would best be served by sharing the economic benefits derived from defense production. (Schmidt, 1989, p. xi).

There are some types of factors such as foreign exchange rates, perception of national security environment, level of industrial development, level of economic growth, offset experience, etc. (Franck, Lewis and Udis, 2008, p. 39) affecting the motives described above. These factors have different degrees of effect over the time depending on the environment.

On the other hand, developed countries, such as U.S., UK and Germany who are generally sellers but sometimes buyers, perceive offsets as a marketing mechanism to create competitive advantage to win international arms sales contracts. Offset offers from seller countries are recognized as a competitive discriminator by buyer countries. Accordingly, multinational companies began using offsets as a global business development tool. (Marvel, April 2001, p. 21) Seller countries also consider possible reputation effect they can gain because of successful offset agreements.[18]

According to the most recent data from the Stockholm International Peacekeeping Research Institute (SIPRI) 41 U.S. companies accounted for 63 per cent of the combined arms sales of the Top 100 arms sales of $315 billion in 2006 (SIPRI, 2008). Studying the U.S. approach toward offsets is therefore important.

Many countries are using offsets, but there is not a global authority mandating or regulating offset practices and procedures. Consequently, every country institutionalizes its own offset requirements. Some countries implement formal regulations, publish policies, structure systems, and mandate offset contract clauses. Other countries implement and impose these policies at the request of procurement authorities. (Barry, April 2001, p. 21) Every country has different objectives pursued through offsets (e.g., emphasis on improving industrial base or technology transfer) and these objectives may change over time depending on the experiences gained by countries from previous offsets (e.g., shift in Spain's approach from indirect to direct offsets, which will be discussed later in this chapter) and recent changes and developments in the world. Studying and understanding other countries' approaches towards offsets as well as their reasons and

[18] In the first decade and a half or so of its life, most informed stories in the press referred not to the F-16 but to the "General Dynamics F-16." This helped motivate the General Dynamics Corporation to ensure that transfer of technology to partner states were successfully conducted to minimize the risk of a high accident rate besmirching the GD name. (Franck, Lewis and Udis, 2008, p. 39).

policies to implement offsets helps formulating the incentives for arms buyer countries, therefore; understanding Turkey's motives and policies to require offsets in weapon systems procurements.

B. U.S. OFFSET POLICY

The policy of U.S. toward offsets changed over time, according to changes in the world and perception of these changes by executive and legislative branches. The main policy drivers may be identified as the desire of Department of Defense (DOD) to maintain national defense industrial base and to avoid unnecessary friction with allies. (Milligan, 2003, p. v) Primary concerns for politicians are the perceived loss of jobs resulting from offsets and adverse effects of technology transfers.

Views on offsets are quite controversial in the U.S. Defense offsets are generally viewed as a key competitive measure for foreign arms sales resulting in increased level of business and production, and decreased unit cost for prime contractors. As Schinasi noted on her testimony before the Committee on Armed Services: U.S. contractors consider offsets an unavoidable cost of doing business overseas. Contractors indicate that if they did not offer offsets, export sales would be reduced and the positive effect of those exports on the U.S. economy and defense industrial base would be lost. These positive effects include both employment in the U.S. defense industry and orders for larger production runs of U.S. weapon systems, thus reducing the costs to the U.S. military. (GAO, 2004)

While offsets have their benefits, they also have some adverse effects on the U.S. economy and industrial defense base. Offsets may result in long-term supplier relationships with foreign companies for U.S. contractors. On the one hand, the U.S. contractor might have found a less costly supplier. On the other hand, U.S. subcontractors may find reduced business opportunities, resulting in the loss of capability in the U.S. industrial base. (GAO, 2004) William Hartung reported that "Due to the growing practice of providing industrial offsets to U.S. arms clients, many major arms deals now produce more jobs overseas than they do in the U.S. For example, components for the Lockheed Martin F-16 fighter are now being produced in ten foreign countries. There are nearly

twice as many workers employed building F-16s in Ankara, Turkey (2,000) as there are at Lockheed Martin's principal F-16 plant in the U.S., in Fort Worth, Texas (1,155)."[19]

Another concern about U.S. offsets is the possible contribution to development of a future competitor by the means of technology transfer. A foreign company may develop the same capability it accessed as a result of a licensing agreement or technology transfer from an offset.. At the same time, national security concerns are directly related to technology transfer to foreign countries.

Historically, the U.S. government has maintained a "hands-off" policy toward defense offsets, viewing them as a part of transaction between the contracting parties. (GAO, 2004) However, in recent years, U.S. policy makers began to recognize globalization as a tool for solving the problem of minimum acceptable number of firms in defense industry to ensure enough competition[20]. Foreign suppliers are to be regarded as full-scale candidates for prime contracts for major systems. The EADS/Airbus consortium (with Northrop Grumman as its North American partner) was encouraged to offer a proposal for a new U.S. Air Force aerial tanker, which won competition in March 2008, but was protested immediately afterwards by Boeing. (Franck, Lewis and Udis, 2008, p. 17)

1. Bureau of Industry and Security (BIS) Offsets in Defense Trade Report[21]

Every year the U.S. Department of Commerce's Bureau of Industry and Security (BIS) prepares a report on the impact of offsets in defense trade as required by section

[19] Summary of this report can be reached at http://www.ncf.ca/ip/global/coat/26/usa/us23 (Accessed 4 October 2008).

[20] The problem is that with scarcity of new production contracts, the market simply cannot support a base with: (a) a competitively attractive number of suppliers of (b) economically efficient size, and (c) within national borders, even U.S. borders. After downsizing, only two domestic firms (Lockheed Martin and Boeing, after acquiring McDonnell Douglas) could offer a credible proposal for the F-35 Joint Strike Fighter (JSF). (Franck, Lewis and Udis, 2008, p. 17).

[21] For more information see "Offsets in Defense Trade – Twelfth Report to Congress" (December 2007) by U.S. Department of Commerce Bureau of Industry and Security.

309 of the Defense Procurement Act (DPA)[22]. The report analyzes the impact of offsets on the defense preparedness, industrial competitiveness, employment, and trade of the United States.

In order to assess the impact of offsets in defense trade, BIS collects data from U.S. defense firms involved in defense exports and offsets. These firms report their offset activities to BIS annually. This report covers offset agreements entered into and the offset transactions carried out to fulfill these offset obligations from 1993 through 2006. Every year, U.S. companies report offset agreement and transaction data for the previous calendar year to BIS. The 1992 amendments to Section 309 of the DPA reduced the offset agreement reporting threshold from $50 million to $5 million for U.S. firms entering into foreign defense sales contracts subject to offset agreements. Firms are also required to report all offset transactions for which they receive offset credits of $250,000 or more.

The official U.S. Government policy on offsets in defense trade[23] states that the Government considers offsets to be "economically inefficient and trade distorting," and prohibits any agency of the U.S. Government from encouraging, entering directly into, or committing U.S. firms to any offset arrangement in connection with the sale of defense goods or services to foreign governments.

C. OFFSET POLICIES AND IMPLEMENTATIONS OF OTHER COUNTRIES

1. Malaysia

Malaysia requires all offset obligors to transfer technology to its defense industry and to establish production facilities and assembly lines for the purchased products in Malaysia. Primary focus is on gaining technology for microelectronics, software, electronic warfare and composite materials. (Kilic, 2007, p. 21)

[22] Section 309 of the DPA was amended in 1992, and the Secretary of Commerce was directed to function as the President's Executive Agent for carrying out the responsibilities set forth in Section 309 of the DPA.

[23] (BIS, 2007, p. 1-2, 1-3).

Technology transfers are evaluated according to price, application areas, and nature of technology. An offset offer is not evaluated for the procurement project proposal if it does not include technology transfers. In addition to technology transfer, maintenance capability of system to be procured is mandatory to be provided by contractor. Malaysia expects to create employment and production possibilities for domestic industry, to increase export, and establish its own industrial defense base.

Direct offsets promote industrial participation, co-production, co-design, maintenance, repair, and modernization, while indirect offsets promote establishment of knowledge creation centers and universities to support technologic development. (Avsar, 2006, p. 37)

Offsets are mandatory if defense procurement project exceeds $10 million. Minimum required offset rate is 50%. Penalty for non-performance is 8%. There is not an established multiplier rate, but; if offset offer includes direct foreign investment; multipliers[24] are applied according to nature of project.

2. Kuwait

The Counter-trade and Offset Regulation published in 1992 is the basis Kuwait's offset policy and implementation. This regulation was revised according to recommendations of World Bank in 2005. The Kuwaiti government aims to reduce its economic dependence on oil and increase the diversity of investments and industries by the means of offsets. Contractors can invest either in projects offered by Kuwaiti government or propose their own investments. (Avsar, 2006, p. 37)

One unique aspect of the Kuwaiti offset system is that an offset project will count towards offset obligations regardless of its location, subject to acceptable Kuwaiti citizen participation. For example, in 1999 an obligor was able to provide investment capital to a

[24] A multiplier is used to increase the value of an offset project when determining offset credit. For example, if a company helped facilitate a $10,000 export of a product with particular importance, the country could offer a multiplier of 5, thereby increasing the amount of offset credit to $50,000. (GAO 2004, p. 1).

manufacturing company located in Turkey by a French company obligated to the government of Kuwait. The reason for this unique policy is Kuwait's limited labor force and industrial base. (Marvel, May 2001, p. 18)

Offsets are mandatory if defense procurement project exceeds $3 million. Minimum required offset rate is 35%. Penalty for non-performance is 6%. Multipliers are applied between 1 and 5 depending on the project.

3. United Arab Emirates (UAE)

The UAE's offset policies require offsets for all defense procurements and for selected major civil purchases on a case-by-case basis. The nation's law requires each procuring agency to involve the UAE offset authority when considering offsets. (Marvel, May 2001, p. 16) Offset authority is the UAE Offset Group (UOG), which negotiates and evaluates contractors' offset proposals and monitors performance and implementation of these projects.

Indirect offsets are more common in UAE. Favored offset projects in UAE are investments by joint ventures of contractors and domestic companies in non-labor intense industries. The UAE, just like Kuwait, supports projects in the industries other than oil because it wants to reduce its economic dependence on oil and diversify its industries. (Avsar, 2006, p. 47)

Offsets are mandatory if defense procurement project exceeds $10 million. Minimum required offset rate is 60%. Penalty for non-performance is 8.5%. Multipliers are not available.

4. Republic of Korea (South Korea)

South Korea has implemented offset policies and counter-trade to maximize its benefits from defense procurements since 1985. Defense Procurement Agency (DPA) is responsible of offsets. Latest revision to offset policy was made in 2003. South Korea's objectives of offsets are:

- Acquisition of defense related advanced technologies,
- Export of parts and components of weapon system being procured,
- Gaining depot level maintenance and repair capability,
- Exporting maintenance and repair capability to foreign countries,
- Becoming a partner in major R&D projects. (Avsar, 2006, p. 47)

Technology transfer is the main focal point of South Korea in both direct and indirect offsets. Public agencies, private companies and other institutions (e.g., universities) review the technology to be transferred by procurement of new weapon systems, and submit a technology evaluation reports to DPA. Contractors have to provide an annual schedule as well as details and conditions for technology transfer in their proposals. Additionally, technical drawings, blueprints, diagrams and pictures of technology to be transferred have to be included in proposals. (Kilic, 2007, p. 23)

South Korea requires technology transfer to be free of charge and to transfer all rights to technology to South Korea permanently. Acquired technologies are protected according to patents, laws and regulations of South Korea.

Offsets are mandatory if defense procurement project exceeds $10 million. Minimum required offset rate is 30 percent. Penalty for non-performance is 10 percent. Multipliers are available through 1 and 6.

5. Brazil

Brazil is intended to reach the following objectives through offsets:

- Improvement of defense industrial base,
- Creating employment and business opportunities,
- Increasing competitiveness of domestic industries,
- Finding new markets for Brazilian export products.

Priorities for investments and technology transfers for offset, in accordance with the objectives stated above, are modernization of aerospace industry by technology transfer and utilization of foreign investments to increase technologic and industrial

capabilities. Brazil, like South Korea, relies on technology transfer as a key policy objective for both direct and indirect offsets. (Kilic, 2007, p. 20)

Brazil tries to be as flexible as possible during negotiations to obtain enough portion of business for aerospace industry by technology transfer. For example, French government provided Embraer (a Brazilian company) with an extensive technology and source codes transfer for development and production of Mirage 2000 BR aircrafts. However, Brazil had to bear the burden of increased production cost in Brazil against its competitor countries as a result of gaining complete access for technology from France. (Kilic, 2007, p. 20)

Offsets are mandatory if defense procurement project exceeds $5 million. Minimum required offset rate is 100%. There are not pre-determined multipliers, which enables Brazil to be flexible to choose the projects and multipliers to its favor to maximize its objectives.

6. The Netherlands

The Netherland's offset authority is Commissariat for Military Production (CMP) within the Netherlands Ministry of Economic Affairs. Offset projects are typically related to the defense industry, which consists of numerous small and medium companies. These small companies focus principally on components and subsystems for defense prime contractors outside the Netherlands. Offset projects thus tend to include export considerations. The Netherland's offset authority's priorities are to:

- Directly involve Netherlands defense industries in defense acquisitions;
- Form international, cooperative work share agreements;
- Facilitate corresponding counter-purchases of components from the Netherlands defense industry;
- Encourage investments in Netherlands defense industry; and
- Promote exports. (Marvel, May 2001, p. 19)

Offsets are mandatory if defense procurement project exceeds €5 million. Minimum required offset rate is 100%. Multipliers are available through 1 and 10. Penalty is either 15% or 30%, and, contractor must still fulfill obligation. (BIS, 2007)

7. The Czech Republic

The Czech Republic formalized its offset policy in 2000[25]. The policy aims to increase levels of foreign investments in the Czech Republic. The drafters of the policy viewed offsets as a way to:

- Acquire new technologies;
- Increase employment opportunities;
- Enhance sustainable economic development; and
- Effectively further "the economic interests of the Czech Republic."

The Czech Republic experienced major changes in its industry, from large heavy industries to small and medium enterprises, because of the end of Cold War in 1989, dissolution of the Soviet Union in 1991 and separation of the Czech Republic and Slovakia from Czechoslovakia. Therefore, government formulated objectives of offsets to complement the overall governmental policy of employment, regional development and industrial development. Compensation for the loss of manufacturing opportunities and jobs incurred by the Czech economy is considered one of the key objectives of industrial cooperation. All other objectives support government policies, like increase in the competitiveness of the domestic industry together with export capabilities, transfer of know-how and progressive technologies, stimulation of foreign investments and support of the establishment of joint ventures and long-term relationships. (Pargac, 2006)

The Czech Republic uses the term "Industrial Cooperation Program" (ICP) for its offset program. The ICP applies to acquisitions from a foreign contractor whose value exceeds $23 million, or where a foreign subcontractor's contract signed with a prime

[25] The Ministry of Industry and Trade consulted with government officials from European allies, such as Great Britain, France, Finland, and Denmark, and held several conferences on the utility of offsets for the Czech Republic with representatives from both private industry and government. (Pargac, 2006, p. 23-24).

contractor exceeds $11 million. The Czech government authorizes an interdepartmental commission to define offset requirements. This offset commission is appointed by the Minister of Industry and Trade for the purpose of coordinating activities and steps related to preparations, negotiations, enforcement, evaluation, implementation, and auditing.

Offset value should equal at least 100% of the procurement value while direct offsets should account for at least 20% of the purchase price.

8. Australia

Australia's offset policy is titled as "Australia Industry Involvement (AII) Program". Investments resulting from offset agreements are categorized as those related to contract and those non-related to contract. Investments non-related to contracts, but aimed to increase capabilities of defense industry, are managed by Defense Material Organization (DMO) according to the Defense Industry Investment Recognition Scheme (DIIRS). Investments, which are included in the contract, are not counted for offset obligation, whereas, investments not included in the contract but related to procurement are accounted for industrial participation in accordance with industrialization plan. (Kilic, 2007, p. 21)

Technology transfers, R&D activities, direct and joint investments and multipliers to be applied to these activities are once set based on the industrialization plan and rarely changed afterwards. One aspect of the industrialization plan is to promote R&D activities of small and medium enterprises.

Offsets are mandatory if defense procurement project exceeds $3.75 million. Minimum required offset rate is not set. There are not pre-determined multipliers. Penalty for non-performance is not set, but generally more than 10% of contract value.

9. UK

The primary focus of the United Kingdom's (UK) offset program is participation by its defense industrial base. The country's offset system is managed from within the UK Ministry of Defense, within the Defense Export Services Organization (DESO).

Compared to other offset authorities worldwide, this unique offset authority has two functions. The first is to promote the UK's agenda in extracting offset projects from foreign contractors selling defense equipment and services to Britain. Second, the authority helps British defense and aerospace companies create offset projects that will help them sell their products and services outside UK. Consequently, DESO is both domestically and export oriented. (Marvel, May 2001, p. 20)

Domestically, DESO works closely with trade a trade association, the British Defense Manufacturers Association (BDMA). The vast majority of projects approved by DESO will tend to be defense oriented joint ventures, technology transfers, component sourcing, and directed procurement. DESO also helps various private defense manufacturing companies to establish offset projects to assist their sales to other countries.

- The UK's offset system evolved to focus on:
- Creating a regional "spread" to the UK defense industrial base;
- Encouraging product diversifications for UK defense companies;
- Encouraging a wider company base for defense manufacturing; and
- Globalizing the UK defense company manufacturing base. (Marvel, May 2001, p. 19)

The Defense Industrial Strategy or DIS is intended for a post-offset regime in defense trade. This may reflect the UK's position as a defense exporter. However, the document is careful to identify core industries in which there must be UK participation in supplying defense goods. Among other things, this provides for a basis for future negotiations over offsets through industrial participation. While "offsets" label will likely not appear in future military sales agreements, those who sell to the British Ministry of Defense (MOD) will undoubtedly have to tie their proposals to furthering the purposes stated in the DIS. (Franck, Lewis and Udis, 2008, p. 121)

Offsets are mandatory if defense procurement project exceeds £10 million; £50 million for French and German companies in conformity with bilateral agreements ("reciprocal waiver agreements"). Minimum required offset rate is not set, but target is

100%. There are not pre-determined multipliers. Penalty for non-performance is not set, however there is strict enforcement of IP program. (BIS, 2007)

10. Spain

Spain is one of the countries to have a positive attitude towards offsets. Spain has been naming offsets as industrial cooperation for a while. Ministry of Defense is in charge of offsets but Ministry of Science and technology is also in coordination with MOD. Main objectives of this industrial cooperation policy are:

- Consolidation of strategic industries;
- Having capability to self-sustain maintenance and repair of weapon system to be procured throughout its lifecycle; and
- Providing opportunities for domestic industries to compete in global market. (Avsar, 2006, p. 47)

Spain provides a very good example for what is happening and changing in the offset arena as countries gain experience from previous projects and reflect those to new projects. When the Spanish offset agreement was negotiated in early 1980s, indirect offsets were much more important than direct variety. This resulted in a large number of countries involved in generally small offset activities. A significant effort was required to administer these operations, as each project had to be approved by Spanish Offset Management Office. The relatively small share of defense-related offsets (28% of total program value) was a disappointment, as was even smaller share representing technology transfer.

Following the expiration of the formal contract period, a three-year “grace-period” was negotiated; this contained substantial changes reflecting the experiences of the first decade. The emphasis shifted dramatically from indirect to direct offsets closely associated with the F-18 aircraft. The nature of these offsets had to be agreed upon in advance, so that the Spanish were no longer simply reacting to suggestions initiated by McDonnell Douglas. (Franck, Lewis and Udis, 2008, p. 53)

Spain is a good and successful example of how a country can implement offsets to enhance its defense industrial base. In the early years of F-18 program, Spanish industry had only a limited capability to handle the direct work on the aircraft. The Spanish defense industry was fragmented, technologically weak, and largely state-owned. To correct this situation, the Spanish Government began to incorporate local industry into defense research activities. From the mid-1980s to 1991, government support of defense R&D had climbed from insignificant levels to nearly 30% of total Spanish government R&D outlays.

These efforts had repercussions beyond F-18 and served to bring the capability of the Spanish industrial base closer to the level of its neighbors. Spain became a player in various European collaborative arms design and production programs – including the European Fighter Aircraft (Typhoon) project, which by the early 1990s was absorbing more than 3/5 of total Spanish defense R&D. It should be noted that the companies receiving the bulk of this investment were largely those that had been most involved in the F-18 direct offset activities. (Franck, Lewis and Udis, 2008, p. 54)

11. Israel

Israel is one of the most significant countries in the world to use offsets. Even though Israel signed Agreement on Government Procurement (GPA) under the terms of World Trade Organization, Israel is the only country to oblige counter trade for civilian procurements with a special exemption from WTO. Israel uses offset for both military and civilian procurements very actively. Industrial Cooperation Agency (ICA) is responsible for monitoring, coordination, and implementation of counter trade agreements related to all governmental procurements.

The objectives of Israel from counter trade and offsets are to; find new markets for Israeli goods and increase export, establish long-term cooperation between Israeli and foreign forms, and promote R&D projects.

Israeli firms are assigned a 15% price advantage[26] in government procurements. Foreign firms have to provide "industrial cooperation commitment" along with their proposals for government procurements. If a foreign firm is awarded for the contract, it has to get its industrial cooperation commitment authorized by ICA, for contracts exceeding $0.5 million, before signing the contract. Minimum offset rate is 35% of the procurement value. At least 20% Israeli subcontractor involvement is required for contracts exceeding $5 million. Penalties are not monetary for non-performance; instead, company unable to perform industrial cooperation commitment is banned from entering future contracts. (Avsar, 2006, p. 43)

D. SUMMARY

The objectives that a country tries to obtain from offsets can be inferred simply from the name of its offset policy without knowing the objectives of that policy (e.g., Australia Industry Involvement). The structure (organization, multipliers, penalty, minimum offset rate), a country organizes to manage offsets, influences the types of offsets it will receive. It is also important to analyze the context of a country to better understand its motives and objectives for offsets, for example; Kuwait and the UAE are trying to reduce their economic dependence on oil while the Czech Republic is trying to rebuild its heavy industry it had before the end of Cold War.

It is not surprising that offset policies and implementations evolve and become more sophisticated over time. Some factors, affecting a country's offset policy, are static (e.g., size and geographic location of a country) and some are dynamic (e.g., experience level, industrial base, strategic policy). Examination of these dynamic factors as well as other changes and developments in the world helps to understand the evolution of offset policies within countries.

Studying and understanding other countries' approaches towards offsets as well as their reasons and policies to implement offsets helps formulating the incentives for arms buyer countries, therefore; understanding Turkey's motives and policies to require offsets in weapon systems procurements.

[26] In a procurement, where Israeli and foreign firms compete against each other, Israeli firms would be awarded even if their price is 15% more than other firms.

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V. HISTORY AND DEVELOPMENT OF TURKISH OFFSET POLICY

A. OVERVIEW

Turkey has been involved in offsets for almost 30 years, which reflects the evolution of offset policies as well as establishment and development of the national defense industry base. This chapter starts with an overview of the Turkish defense industry; it then summarizes the history of Turkish offset applications in the context of established organizations, published documents and national policies. An evaluation of the official offset regulations published by SSM is warranted. Finally the outlook for Turkish offset applications will be discussed.

B. OVERVIEW OF TURKISH DEFENSE INDUSTRY

The first initiative in establishing a defense industry in Turkey goes back to the period of the Ottoman Empire. Defense industry had a strong position up until the 17th century but couldn't keep up with European technical and industrial developments, and had lost much of its capabilities starting from the 1st World War. (Ozcan, 2006, p. 12)

No major national defense industry developments occurred until the early years of the Republic of Turkey; and those which were limited to establishment of new facilities near Ankara based on the needs of the Independence War. The new Turkish government placed a high priority on the defense industry in its industrialization plan. Even though industrialization got high priority, a strong industrial base could not be established due to Turkey's domestic conditions and global economic conditions.

Development of a national defense industry was halted after the 2nd World War, as a result of foreign grants and aids mainly from U.S.[27] that increased after Turkey

[27] The Truman Doctrine is a proclamation by Harry S. Truman, President of the United States on March 12, 1947It stated that the U.S. would support Greece and Turkey economically and militarily to prevent their falling under Soviet control.

became a NATO member. Therefore, Turkey became completely dependent on U.S. and NATO aids to meet the requirements of the armed forces.

Turkey also faced a number of delicate situations in a short period of time, like the Cyprus crises of 1963 and 1967, and the Cyprus Peace Operation in 1974. The arms embargo which followed the Cyprus Peace Operation reminded Turkey of the necessity to establish and develop a national defense industry base. The deadlock experienced in this period caused Turkey to seek alternative ways to reactivate its national defense industry.

Accordingly the Turkish Armed Forces Strengthening Foundation[28] was established in 1974, and facilitated opportunities to invest in defense industry. Although these efforts resulted in enterprises such as ASELSAN (1975), ASPILSAN (1981), and HAVELSAN (1982), it was soon realized a modern defense industry could not be developed without other initiatives. (Yarman, May 2008, p. 19)

In the 1980s, a state initiative was undertaken to modernize the Turkish Armed Forces and to establish a national defense industry. The first step was the establishment of Defense Equipment Directorate as a state enterprise. However, the shortcomings stemming from its state-bound status proved fatal, and all the properties of that enterprise were transferred to SSM — which was established in 1985 under Law No: 3238. It is not surprising SSM requested offsets for all defense procurements, first as a tool of financing to compensate for the cost of the procurements, and establishing a national defense industry. Later offsets were used as tools for developing the defense industry, and finally to reach Turkey's strategic goals.

In this period, major defense procurement projects such as F-16 (1987), Armed Personnel Carrier (1988), Mobile Radar Complex (1990), Electronic Warfare Equipment for F-16, HF/SSB Radios, CASA Light Transport Aircraft (1991) were undertaken. A number of defense industrial companies were established with foreign capital

[28] This foundation consisted of sub-foundations for Army, Navy, and Air Force.

contributions such as TAI (1984), TEI (1985), MIKES (1987), FNSS (1988), MARCONI KOMUNIKASYON (1989), THOMSON – TEKFEN RADAR (1990) to carry out the new projects[29].

Over the 23 years since its establishment, SSM has made real achievements in the creation of a modern national defense infrastructure, with highly successful results in critical areas. Key defense industrial institutions have been established to meet the requirements of the Turkish Armed Forces (TAF) through local sources, each of which fill an important gap in their scope of activity.

Additionally, some important capabilities have been obtained in the framework of the projects and industrialization activities. These capabilities are technology infrastructure, export capability, strengthening sub-sectors, restructuring industry, and expertise. Turkish defense industry is now able to manufacture world-class products and has a wide research and development program.

Turkish defense companies can meet 25% to 30% of the TAF annual requirements based on 2007 data. Total sales and exports of Turkish defense companies are presented in Table 2 for last four years. What SSM achieved in defense industry is very significant considering Turkey was not able meet any of its defense needs domestically 30 years ago.

YEAR	SALES	EXPORTS
2004	1,337.120	196,341
2005	1,591.162	337,422
2006	1,720.405	351,989
2007	2,260.758	250,154

Table 2. Turkish defense industry results ($ million) (From SASAD 2007 report)

[29] SaSaD, Defense Manufactures Association, http://www.sasad.org.tr/main.asp (Accessed 2 October 2008).

SWOT analysis, presented by Goknur Pilli at SSM Offset Conference in 2007, for Turkish defense industry provides a useful means to assess the industry's current position.

- **Strengths:** Experienced engineering workforce, lessons learned from previous projects and SSM's support to indigenous defense industry,
- **Weaknesses:** Lack of enough qualified labor (engineering for R&D) to meet local Defense Industry growth,
- **Opportunities:** In-country development and R&D projects in parallel to SSM's strategic targets for 2011,
- **Threats**: Insufficient priority to indigenous defense industry products and services

C. OFFSETS IN TURKISH DEFENSE INDUSTRY

1. History of Offsets in Turkish Defense Industry

Turkey's first offset implementation occurred in 1973 when the hulls of fifth and sixth submarines were manufactured in Golcuk naval shipyard as a part of purchase of six submarines from German company IKL/HDW. (Gencturk, May 2008, p. 18) However, the F-16 procurement program in 1984 was the first significant project where offsets were implemented. The program was implemented and monitored under the responsibility of the Ministry of Defense (MoD). The Undersecretariat of Treasury and Foreign Trade actively participated at the steps related with the export of commercial and industrial goods under the program. (Ilbas, 2002, p. 37)

The first office for managing offset implementations was established in 1985 with the name of "Defense Industry Development & Support Office" (SAGEB). The establishment of this office was based of the Law no. 3238. Its name was changed to "Undersecretariat for Defense Industries (SSM)" with the same duties, responsibilities and authorities: managing and coordinating offset implementations for Turkish defense procurements.

Defense Industry Law (Law no. 3238), ratified by Turkish Parliament in 1985, is very important as an expression the serious intention of the government to develop a national defense industry base and to accordingly implement offsets for defense related procurements.

SSM, an institution capable of formulating long term policies and principles for defense offsets was established with this law. This law stated domestic suppliers should be facilitated to the maximum extent practicable for foreign arms procurements, pointing to offsets. In addition to introducing a totally new approach and mindset for the Turkish Defense Industry, the law has also established a highly flexible and efficient administrative mechanism. The five main pillars are the Defense Industry Executive Committee[30], Undersecretariat for Defense Industries, the Defense Industry Support Fund[31], Defense Industry High Coordination Council and Defense Industry Control Committee.[32]

SSM (Undersecretariat for Defense Industry):

Established in 1985, SSM is the only authorized institution for defense offsets in the Turkish government. The main goal of SSM is to constitute a modern defense industry in Turkey and to facilitate the modernization of the Turkish Armed Forces. An authorized department for defense offset implementations was very beneficial to accelerate the new applications established by Law no. 3238, to integrate private industry with public defense industry.

The main tasks and responsibilities entrusted to SSM are as follows:

- To carry out decisions of the Defense Industry Executive Committee,

[30] The main decision making body of the system, Defense Industry Executive Committee is headed by the Prime Minister, and includes the Chief of General Staff and the Minister of Defense as its members. The Executive Committee has been tasked with the critical decisions relating to defense industrial issues and major defense procurement projects. Another responsibility of the committee has been to render possible nation-wide coordination between all entities with a defense industry dimension.

[31] The Fund was envisioned as the purpose-built financial instrument to enable SSM to carry out its tasks. A highly flexible and non-bureaucratic mechanism with a constant flow of financial resources is in full and independent control of SSM. Among the main incomes are; allotments from the corporate tax, fees and levies imposed on alcoholic and tobacco products, and all forms of chance games and betting, lottery etc.

[32] For more information see http://www.ssm.gov.tr/. (Accessed September 2008).

- To reorganize Turkish Industry in accordance with the prerequisites of defense industry,
- To plan production of modern arms and equipment at private and public sector enterprises,
- To undertake research and development of modern arms and equipment, to have their prototypes built, to make advance payments, to plan advance orders, and determine other financial and economic supports,
- To coordinate export and offset trade issues relating to defense industry products.

The mission of the SSM is: to meet the requirements of the Turkish Armed Forces and the government organizations that promote national defense; to establish and implement strategy and procedures for the development of defense industry.

The vision statement of SSM is: to be the procurement authority leading a Turkish Defense Industry that is competitive, integrated with the international market and introduces uniquely indigenous defense solutions in accordance with technological improvements.

SSM is also responsible for publishing official documents to set guidelines both for foreign contractors and domestic manufacturers. As a result of experiences gained from offset projects and changes within global economy, it was considered necessary to publish official guidance to identify bureaucratic processes and evaluation criteria for offsets, to set guidelines for domestic and foreign companies, and to create a systematic approach for offset applications. Based on these needs, the first official document about offset applications was published at 1991 with the name of “Offset Handbook “. This handbook was revised in 2000 with the name of “Offset Directive”. Recently, the offset document was revised in 2003 and revised again in 2007 – with the name “Industrial Participation & Offset Directive”.

Gencturk[33] believes that Turkish policy on defense related offsets can be analyzed in three periods:

- 1st period,1984 to 2000: Offsets were implemented as a tool of financing.
- 2nd period, 2000 to 2007: Offsets were implemented to develop the national defense industry base.
- 3rd period, from 2007: Offsets were implemented to increase the competitive power of Turkish defense industry and to reach the strategic goals of SSM.

a. Offset as a Tool of Financing (1984– 2000)

The main purpose of the Turkish Government for both offsets related to acquisition of F-16's and the other offsets managed by SSM (called as SAGEB then) was to provide foreign financing for the procurement projects. This purpose of offsets as a tool of finance manifested itself in the first official document, Offset Handbook, as a primary objective; "… to provide foreign currency through exporting defense products and the other related industrial products and foreign capital investments, consequently; to recover foreign currency flowing out because of the procurement to maximum extent possible" (Offset Handbook, 1991)

Even though there was not an official published offset policy and some flexibility was provided on project basis during the projects realized from 1985 to 1991, uniformity was tried to be maintained throughout the projects. Offset definition and basis of implementation, based on traditional direct and indirect offset categorization were standardized with the handbook that was published officially in 1991.

In addition to being regarded mainly as a tool for financing foreign arms procurements, offsets contributed to development of the national defense industry by providing technology and knowledge transfers between 1991 and 2000. Indirect offsets

[33] Hasan Gencturk is the author of "Offsets in Defense Industries" thesis of expertise for SSM in 1989, which is the first study in this area in Turkey.

were more common than direct offsets in this period. It is not realistic to expect Turkey, a country with a developing defense industry, to demand a higher ratio for direct offsets for projects requiring high technology.

In 1998, the Turkish government announced "Principals of Turkish Defense Industry Policy and Strategy" which restated that defense related offsets should be coordinated by one organization (SSM) within MoD in official government newspaper[34] in conjunction with the development in defense industry base. This policy laid the foundation of first major revision, Offset Directive of 2000, to offset policy of SSM.

The period from 1991 to 2000 was a time for learning, as well as completing the defense industrial infrastructure. It was also a time for developing defense industrial policies. With the experiences gained from this period, SSM focused on selective offset applications, which contributed to defense industry directly, and started to prioritize the offset applications accordingly. Results from this period were incorporated in the Offset Directives of 2003 and 2007.

b. Offsets as a Tool for Developing Defense Industry

"Principles of Turkish Defense Industry Policy and Strategy" published in 1998 and the "Offset Implementations in Defense Acquisitions Directive" (2000) started the second period. SSM was then tasked as the only organization for all defense industry acquisitions. SSM didn't codify all the critical changes in official documents until 2003 – with 2000 to 2003 being a transition period. SSM focused on the direct offsets in directive published in 2000, albeit by using a traditional offset approach.

The most important change realized in Offsets Directive of 2003 was the "Offset Credit System" (also named as "Temporary Crediting" or "Advance Crediting"). This was intended to support and encourage contractors for future offsets.. After contractors completed their obligations for the current offset, additional offsets provided would count towards future offsets. Therefore, SSM enabled the continuation of

[34] Official Government Newspaper, June 20, 1998.

cooperation between Turkish defense industry and foreign companies even after the completion of the initial obligation which was one of the measures to assure integration of Turkish defense industry to competitive international market by the means of cooperation.

The main objective during this period was to strengthen the national defense industry base. Accordingly, multipliers were assigned to technology transfer type of offsets. Turkish companies receiving technology transfers were obliged to SSM for their earnings from the transfer. This idea would be defined as "monetary limits" in Offsets Directive of 2003. SSM, considering the level of national defense industry development, eased requirements for offsets by counting the total amount of exports if local content exceeded 51%.

The new priority in the Offset Directive of 2003 was "…to increase the capacity and capabilities as well as to increase the market share and the competitive power of the national defense industry in the international market …" Consequently, the definition of the offsets was changed by replacing the traditional ideas of direct and indirect offsets with a set of prioritized categories. Transition period that started in 2000 became more significant by using four categories in the directive of 2003. Exporting the products and services of the defense industry was the first priority, and entering new markets in the international arena was considered imperative for development of the national defense industry. Technology transfers were no longer seen as a priority any more and thus were defined as Category Four offset transactions (due to the difficulties encountered during implementation).

The Offset Credit System that was enacted in the Directive of 2000 was expanded by allowing firms having no contracts with SSM to take on offset projects and have these projects counted toward future offset obligations.

c. Offset as a Tool for Reaching the Strategic Goals (2007 – Future)

SSM made significant changes to offsets policy, reviewing it according to the objectives of the "2007-2011 Strategic Plan". SSM emphasized the use of offsets as a

critical and selective tool in its strategic plan, based on the relation between the success of offset applications and current development of the national defense industry. SSM expanded the definition of offsets to include local content. The latest directive is named "Industrial Participation and Offset Directive" and was published in February 2007. The number of the categories for offsets defined at the previous directive was reduced to three from four.

Latest offset directive classifies the offsets in three categories; category-A, category-B and category-C.

- Category-A refers to goods and/or services (within the related project) to be produced domestically (Local content).
- Category-B refers to the export (by Turkey) of defense, aeronautic and space related goods/services, and export of goods/services related to the contract.
- Finally, category-C refers to the technologic cooperation, new and/or expanding investment, and R&D activities related to defense, aeronautics and/or other activities requiring advanced technologies.

Multipliers for export offsets were reassigned with software exports assigned with a single multiplier, instead of varying multipliers for different software qualifications in previous directive. While the highest multiplier was assigned for platform exports, lower multipliers were assigned for sub-parts and components at subcontractor level — in line with the development of defense industry.

One of the conveniences provided with new directive is cancellation of the mandatory added value re-payment required from domestic firms realizing the benefit of technological cooperation and R&D offsets. This regulation prevents increases in costs and decrease of the competitive advantage for Turkish companies that need technological cooperation.

Increased multipliers for exports from small; and medium-sized enterprises (SME) are applied as national defense industry mainly consists of such enterprises rather than a few major companies.

The minimum threshold for offset obligation is increased to $10 million, or equivalent, and the offset obligation is calculated over the total value of project rather than import portion. Inclusion of local content to the offset definition can be interpreted as SSM recognizing that the national defense industry base had increased its international competitiveness. However, it is also possible that SSM wants to increase Turkish competitive advantage in international markets, and to accelerate the integration by not assigning multipliers for local content portion.

Another innovation adopted by the new directive of 2007 is allowing a foreign company with offset obligations in Turkey to exchange this obligation with a Turkish company that has offset obligation in that foreign country. This approach is intended to stimulate Turkish defense companies to pursue opportunities abroad more actively and is a concrete example of SSM's increasing support to defense companies entering new markets.

2. Analysis of Offset Documents by Published SSM

SSM is the only authority for defense offsets and therefore responsible to set guidelines for offsets. SSM published four directives for offsets to capture previous experiences, reflect recent changes in government strategies and policies, and development level of national defense industry.

a. 1991 Offset Handbook

Main objectives sought in 1991 offset handbook are encouraging foreign currency inflow through foreign investments, saving national funds by transferring technology, increasing indigenous production capability, and enhancing the quality and productivity of existing and new defense industry companies. Foreign capital

investments, technology, license and know-how transfers, R&D activities and joint ventures with foreign companies are categorized as indirect offsets. Some key points of this handbook are as follows:

- A foreign company can not transfer its investment to a third party until 10 years after realization of the investment.
- Multipliers between 2 and 4 are applied to investments and technology transfers according to their type. An additional multiplier of 2.5 is applied if the investment is in a prioritized development region. The multiplier for R&D activities is 5.
- Profits earned through foreign investments are counted as indirect offsets if they are re-invested domestically.
- Exports of goods produced by Turkish companies as a result of foreign investment are credited as indirect offsets for 10 years.
- Companies benefiting from technology, licenses and know-how transfers have to accept becoming obligated to MoD and SSM for revenues earned as a result of these activities.

Investments in defense industry and technology transfers are categorized as indirect offsets. In other words, even if technology transfers and foreign investments are directed towards development of the national defense industry, they are treated as indirect offsets. It seems reasonable to conclude that these activities have a lower priority according to 1991 Offset Handbook. (Kilic, 2007, p. 29)

b. 2000 Offset Implementation Directive for Defense Acquisitions

The main objectives pursued in the 2000 offset directive are similar to those in the1991 offset handbook. However, existing or new foreign capital investments are classified as defense related and non-defense related, and multipliers are assigned accordingly. Technology, license and know-how transfers, R&D activities, and joint ventures were still categorized as indirect offset, as they were in the 1991 Offset Handbook. Some key points of this directive are as follows.

- A foreign company can not transfer its investment to a third party unless 5 years pass after the realization of investment. This was 10 years in the previous directive. If a company withdraws its investment before completion of 5 years or without notifying SSM, offset credit will be cancelled and company will pay 10% annual penalty.
- Activities related to technological cooperation under offset obligation must include technologies compliant with U.S. and EU norms.
- If a foreign company transfers technology or contracts for R&D activities with a Turkish company, that company is obliged to pay back 50% of the offset transaction (before multipliers are applied) without interest to Defense Industry Support Fund in USD or Euros in a 5 year period. Even though this regulation was intended to provide a method for Turkish companies to assess the value and quality of technology transfer, this regulation discouraged technology transfers in practice.
- SSM, considering export potential of offset related goods, may require export guarantees.
- The multiplier for defense industry investments is 3, and 2 for non-defense industry investments. If investment is in a prioritized development region, a multiplier of up to 8 is applied. Technological cooperation has a multiplier between 3 and 6; R&D activities have a multiplier between 5 and 8.

Comparison of 2000 Offset Directive and 1991 Offset Handbook shows that even if the multipliers and investment areas are expanded; the 1991 handbook mentality is maintained, since investments and technology transfers are still categorized as indirect offsets. (Kilic, 2007, p. 31)

c. 2003 Offset Implementation Directive for Defense Acquisitions

The official definition of offsets is changed by discarding the traditional definitions of direct and indirect offsets, and using definitions with categories based on priorities. Four offset categories are defined as:

- Export of defense industry goods and services
- Export of prioritized industrial goods and services[35]
- Export of other industrial goods and services
- Technological cooperation, investment, R&D and training activities

Although it may look like a new system, this categorization is simply a different form of traditional direct versus indirect offset categorization. Export of defense products and services is the first priority based on the idea of accessing new markets in the international arena is imperative for development of national defense industry. Technology transfers are not seen as a priority any more and thus are defined as category four offset transactions due to the difficulties encountered during previous projects; receiving lowest multiplier when offset credit is calculated. Some key points of this directive are as follows:

- 50% payback rate, set in 2000 directive, for Turkish companies receiving technology transfers or R&D activities resulting from an offset is reduced to 30% to 50% range and payback period is prolonged from 5 to 6 years to provide more flexibility. If recipient company is government owned, payback can be in form of goods and services.
- Investing foreign company can not transfer this investment to a third party unless 5 years pass after the realization of investment.
- SSM, considering export potential of offset related goods, may request export guarantee.

[35] Prioritized or preferred industry products and services are available at SSM website http://www.ssm.gov.tr/EN/duyurular/proje/Pages/default.aspx. (Accessed September 2008).

- Multiplier for defense industry investments is 3, while multiplier for non-defense industry and high technology investments is 2. If investment is in a prioritized development region a multiplier up to 9 is applied. Technological cooperation has a multiplier between 1 and 5; R&D activities have a multiplier between 3 and 6.

Payback rate at 30% - 50% range for Turkish companies receiving technology transfers or R&D activities resulting from a technologic cooperation offset made this type of activities hardly possible. As a matter of fact, no significant offset activity in this area after 2003 indicates misapplication of this aspect. (Kilic, 2007, p. 33)

d. 2007 Industrial Participation/Offset Implementation Directive

SSM defines the industrial participation/offsets (IP/O) as activities secured in a project to use domestic industry capabilities, increase the competitiveness of national defense industry through exports, and facilitate technologic cooperation, investment and R&D capabilities in this latest directive.

The new categories associated with 2007 Directive were explained above. Some key points of this directive are as follow:

- The payback regulation, which was one of the major barriers to technology transfers, is cancelled and SSM has the right to require export guarantee at the amount of offset value (before multipliers are applied) for technological transfer type of offsets. Cancellation of payback mechanism of 2003 directive and introduction of export guarantee instead can be interpreted as a constructive change for technology transfers. However, this application may pose a barrier to technology transfer unless flexibility for contractors and Turkish firms is provided in application.
- The IP/O ratio to be committed by the contractor should be at least 50% of the procurement agreement having a value $10 million (or equivalent currency amount) or more.

- Multipliers for technological cooperation, investments, and R&D activities are shown in Table 3. Reduction in multipliers from 2003 directive coupled with the new requirement for export guarantee presents difficulties to stimulate contractors to mentioned areas.

Technologic Cooperation, Investment, R&D Activities	**Multiplier**
System Integration	**3**
Network, Information, Satellite and Sensor Systems	**3**
Electronic Warfare	**3**
Missile, Guide and Control	**3**
For defense, aeronautics, aerospace industries and/or other areas requiring high technology; A. Technological cooperation, B. New and/or extended investment, C. R&D activities	**2**
Investments in scope of Advanced Technology Industrial Park and Airport (ITEP) Project	**2**

Table 3. Multipliers for technological cooperation, investments, and R&D activities (From SSM, IP/O Directive, 2007)

- Multipliers for exports are presented in Table 4. In case the exports are realized from SMEs, 1 is added to the multiplier to be granted. In case of the products whose R&D and/or design is realized in Turkey, 1 is added to the multiplier to be granted. In case of the export of the products produced for the first time in Turkey, 1 is added to the multiplier to be granted if the product is deemed critical by SSM. In the determination of the multipliers, the products related to the platforms, systems and sub-systems are identified by SSM. The highest multiplier that can be granted is 5.

MULTIPLIERS FOR EXPORT	
PLATFORM	**4**
SYSTEM	**3**
SOFTWARE	**3**
SUB-SYSTEM	**2**
PART-COMPONENT	**1**

Table 4. Multipliers for exports (From SSM, IP/O Directive, 2007)

D. PRESENT AND FUTURE OUTLOOK OF TURKISH OFFSET POLICY

The present objective of SSM is to encourage cooperation in high level technological areas that require a well qualified work force with low investment cost in order to market and sell the end product to other countries that will be a mutually beneficial business solution for domestic companies and contractors those would like to increase their competitive advantages. Turkish defense industry provides contractors long-term and mutually beneficial business environment, which brings more than the opportunity of just fulfilling their specific offset obligations.

One of the main responsibilities and duties of SSM is to direct the funds, necessary for the maintaining Turkish Armed Forces' needs, back to Turkish national industry. This imperative causes the projects realized in Turkish industry to have the highest priority.

SSM has signed a total of 77 agreements its establishment in 1985. Twenty-two of these agreements were successfully completed and the remaining 55 agreements are still in progress. About $ 6.5 billion total amount of offset commitments have been undertaken by SSM, while 3.9 billion $ of them are direct offsets and 2.6 billion $ of them are indirect offsets.

Analyzing completed offset commitments shows that realized amount of offset commitment for these projects is higher than contractual amount both for direct and

indirect offsets. Table 5 shows contractual versus realized values for completed direct and indirect offset commitments. Direct offset commitments were $1.29 billion in contract but realized as $ 1.35 billion at 105% realization rate. Indirect offset commitments were signed to be 1.82 billion but realized as $ 2.12 billion at 116% realization rate. Total contractual value for offset was $ 3.11 billion but realized as $ 3.47 billion.

	Direct Offsets	Indirect Offsets	Total Value
Contractual Value ($ billion)	1.29	1.82	3.11
Realized Value ($ billion)	1.35	2.12	3.47
Realization	105%	116%	112%

Table 5. Realized versus contractual values of offset commitments

Because, Turkey is a developing and growing country especially in technology and investment area, future benefits and profits from offset application will be bigger unless the systematical approach in offset area is abandoned.

Figure 3 represents the remaining offset commitments by years. This figure also shows the importance of consistent and patient implementation of offsets; because results of offset applications are observed in long-term. (Pilli, 2007)

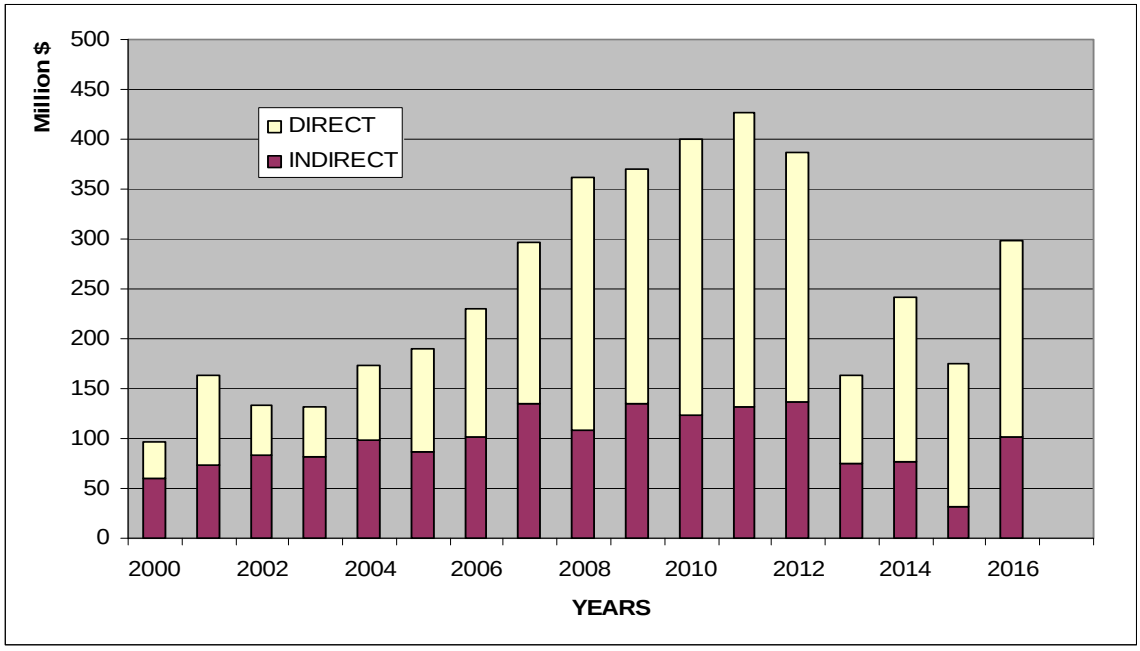

Figure 3. Remaining offsets commitments by years (From Pilli, 2007)

The future outlook of SSM and its offset policy is stated in "Strategic Plan for 2007-2011". SSM's Strategic Goals for 2011 related to offsets are:

- Restructure the defense industry to be able to provide unique local solutions and compete in the international arena
  - Increase the Turkish defense industry's work share average to 50% in the frame of procurement projects[36].
  - One billion dollars of export in defense goods and services[37].
  - Harmonize the quality management systems of the defense industry companies with SSM's quality policy.
- Participate actively in the multinational defenses and security projects that promote the international cooperation
  - Participate at least in four multinational defense projects and lead at least to an international project

[36] Current rate is around 41.6% (Bayar, 2008, p. 23).

[37] Defense export was 250,154 in 2007.

- Increase the participation of Turkish defense industry in the NATO defense projects by four times to current ratio.

E. CONCLUDING REMARKS

Offsets played a key role in establishing and developing a national defense industry for Turkey. SSM is the expert organization for defense offsets — negotiating, signing, monitoring and implementing offset agreements and setting guidelines. It must be noted that SSM's approach towards offsets changed in time in accordance with national policies, changes in global arena, and development level of defense industry.

Strategic plan of SSM for 2011, along with the latest offset guideline "Industrial Participation and Offset Directive" published in 2007, sets the new direction for Turkish defense industry as to seek participation in international projects and accessing new markets. The JSF and A400M projects that are studied in next section are ideal examples reflecting this new direction of Turkish defense industry.

V. SELECTED PROCUREMENT PROJECTS WITH OFFSET IMPLEMENTATIONS

A. OVERVIEW

The F-16 procurement project is a milestone in the development of Turkish offset policy, since it was the first major project involving offsets. The A400M and JSF projects reflect the present state and future direction in offset policies. The three major weapon procurement projects selected (out of 22 completed, 55 ongoing projects involving offsets) will be basis for case analysis--although limited in scope and depth. They are, however useful for enhancing understanding of Turkish offset policy. Key facts, benefits and experience gained will be emphasized in each case analysis.

B. THE F-16 PROJECT

Turkey has sought advanced technologies by implementing offsets for its defense. In this manner, Turkey first started offset applications in the defense industry with the agreement signed in 1984, based on local co-production of 160 F-16 Fighting Falcons in Turkey. This first significant offset agreement signed with General Dynamics, the program was implemented and realized under the responsibility of the MoD. The Undersecretariat of Treasury and Foreign Trade actively participated at the stages related with the export of national commercial and industrial goods under the program. (Altan, 1999)

The offset percentage was set at about 25% or $1 billion. In exchange for the purchase of 160 F-16 aircraft, General Dynamics agreed to allow the assembly of 152 aircraft in Turkey using parts from United States and European, as well as from new Turkish plants co-owned by General Dynamics, General Electric, Turkish industry, and the Turkish government. General Dynamics also agreed to provide about $800 million in non-defense-related offsets, including investments in the Turkish hotel industry and in a thermal power plant project (Schaffer, 1998, p. 40). As a major export country, the U.S. administration examined Turkey's requests for export license and technology transfer on

a case by case basis, rather than making general commitments, and related with this situation all critical equipment was produced in the United States and added to planes in F-16 fighter co-production in Turkey.

Offset applications can be problematic with sole-source procurements. They should be evaluated very carefully, because applications may sometimes increase the overall price of the agreement. The reason for this risk is absence of competition. For this reason, offset applications should be evaluated separately for all projects when the procurement is done by a sole source. The offsets for the Turkish Air Force (TUAF) F-16s are also an important example. Offsets at a rate of 50% of the sub-agreement supported procurement and modernization of TUAF F-16s. This rate meant about 500 million USD and a majority of the cost of the project (which would be funded by Turkish government). Turkey then minimized deficits in the balance of payments associated with defense procurements. This offset application was a good example for the evaluation and application of the offsets separately at the procurements from sole sources. (Avsar, 2006, p. 86)

When the F-16 offset agreement was first signed by Turkey, it wasn't expected to be as a process as long and complicated as it turned out to be. The first F-16 offset applications started with General Dynamics in 1984 as a co-production and co-assembly program but it has expanded to include a number of different F-16 offset applications at various levels. After the initial procurement, the project became the most important modernization program Turkish Armed Forces requested. F-16 offset agreements can be separated and studied under following phases:

1. Peace Onyx – I

The procurement of F-16s was an important and expensive procurement project for Turkey. 132 F-16 Cs and 28 F-16 Ds at a total cost of $4.2 billion in 1983 were sold to Turkey for cash and a Foreign Military Sales (FMS) loan from the Pentagon. Related with this sale, a direct offset commitment of $150 million was signed on May 11, 1984, committing American General Dynamics to purchase components and parts in Turkey's aerospace program directly or to provide training for it. General Dynamics agreed that

out of a total package of 160 F –16 C/Ds, the first 8 aircraft would be delivered from the General Dynamics production line in the U.S., with the remaining 152 aircraft to be delivered from Turkish Aerospace Industries' (TAI) production line. On November 9, 1984, General Dynamics signed an indirect offset commitment, agreeing to provide services and to export products from Turkey unrelated to the F-16 program. In addition, the firm committed to fund the setup of a new aerospace company, TAI. The purpose of this new company was to assemble and co-produce the F-16s in Turkey, and to provide support for the program including research, development, design, training, and servicing. (Ilbas, 2002, p. 54)

General Dynamics set up TAI as a joint venture with Turkey and its principal subcontractor, General Electric Corporation, which manufactures F-16 engines. Of the $137 million required to fund the project, General Dynamics provided $58 million (42%); General Electric, $9 million (7%); Turkey, $68 million (49%); and the Turkish Air Force Foundation and Turkish Aeronautical Association put in the remaining $2 million (2%). Thus, TAI was 51 percent Turkish owned and 49 percent U.S.[38].

General Electric helped create Tusas Engine Industries (TEI), a Turkish-American joint stock company, to manufacture engine parts and assemble the F110-GE-100 engine for the TAI F-16 production line. Assembly of engines and the manufacture of parts started in 1987. The start-up phase was completed with the co-production of selected parts by the end of 1989. Having successfully completed the start-up phase by the end of 1989, TEI moved into the mature growth phase. TEI is now mature supplier of engine components in the global market.

The Turkish government allowed General Dynamics to spend the $150 million direct offset commitment on the development of a whole town around the TAI complex. This included housing for 2,000 personnel working in the plant, a hospital, mosque, school, waste treatment plant, power plant, and roads, as well as job training. (Ilbas, 2002, p. 55)

[38] For more information see TAI website http://www.tai.com.tr/en (Accessed 20 October 2008).

The first plane rolled off the assembly line in October of 1987, ahead of schedule. Peace Onyx-I provided a ten-year plan to modernize the Turkish Air Force, to develop an indigenous aerospace industry, and to deepen Turkish-U.S. military relations. As with the creation of TAI, General Dynamics requested support for the offset commitment from its principal subcontractors, General Electric Corporation (making the engines) and Westinghouse (providing the radar). General Dynamics had overall responsibility for the $1.27 billion indirect offset but was able to sign separate commitments with General Electric Corporation for $317.5 million (25%) and with Westinghouse for $152 million (12%). (Ilbas, 2002, p. 55)

The performance period was for ten years with a three-year grace period, which means that the offset was to be completed by 1994 or, with the grace period, by 1997. There is a complex penalty formula for noncompliance. A review period every two years was intended to smooth out the process, so that General Dynamics completed much of the commitment at the end of the performance period.

The Turkish government published guidelines for indirect offsets, asking General Dynamics to fulfill 90 percent through the procurement and export of Turkish products and 10 percent through capital investment and the promotion of tourism in Turkey. When General Dynamics began to search for products to export from Turkey (such as cotton, textiles, and orange juice concentrate) they found the process difficult, time consuming, and expensive. General Dynamics could get only one dollar of offset credit for each dollar of product exported. In 1984 and 1985, the Turkish authorities began to change priorities. They started to believe that investment was worth more because of its inherent leverage. Since dollars invested in an industry (e.g., tourism area, a hotel) could generate far more cash than the original investment sum, Turkey began to encourage General Dynamics to invest more, even to reverse the percentage under the guidelines with 90 percent to be fulfilled by investment. The incentive Turkey provided was awarding General Dynamics offset credit based on a multiplier formula. General Dynamics thus received offset credit, to be negotiated in each case, of several times the value of its actual investment. The leverage could be further increased since General Dynamics could use its reputation and network to enlist the support of investment partners.

The first indirect investment was in the Ankara Hilton Hotel, followed by one each in Izmir, in Mersin, and in Istanbul. The advantage to General Dynamics was that its money would generate a cash flow and eventually a profit once the investment was paid back. General Dynamics had put together another investment project in Turkey with Bechtel, the giant U.S. engineering and construction firm. General Dynamics invested about $20 million in a billion dollar thermal power plant project. Bechtel lead the construction but was joined on a subcontract basis by other investment partners, Combustion Engineering (U.S.), Siemens (Germany), and Royal Dutch Shell. General Dynamics expected to get $250-300 million in offset credit for this project, and the government guaranteed a 15-20 percent return on investment (Hickok, 2000).

Under the Peace Onyx-I Program TAI manufactured and delivered 152 F-16C/D aircraft in Block 30 and 40 configurations at the TAI facilities to the Turkish Air Force between the years 1987-1995. The Program totaled 160 F-16s, eight of which were produced in the U.S. and delivered to Turkish Air Force.

2. Peace Onyx II

The development of TAI capabilities led to new goals for Turkish industry and defense authorities. The original Peace Onyx had transferred the necessary technology and know-how to establish a Turkish aerospace industry. The second co-production program of F-16 fighters, Peace Onyx-II was signed on 26 March 1992. At first, the contract called for the purchase of 34 F-16 C and 6 F-16 D Block 50 aircraft with a total estimated cost of $1.515 billion. In 11 February 1994, the contract changed with an amendment reflecting the shift from 40 to 80 aircraft. The first 40 planes were funded primarily by Saudi Arabia, Kuwait, and the Emirates in return for Turkey's cooperation in the Gulf War. A direct offset commitment of $133.7 million was signed, committing General Electric to purchase components in Turkey’s aerospace program directly. Within this project, a $256.2 million indirect offset commitment was signed. Maintenance hangars for F-100, F-129 and CT-7 engines were built and training was provided by General Electric to TUAF (Ilbas, 2002, p. 58).

Under the Peace Onyx-II program, TAI produced an additional 80 F-16C/D Block 50 aircraft from 1995 to 1999. The manufacturing share of the company reached 80% with the addition of flaps, ailerons and the stuffing tasks for the forward fuselage to the airframe components manufactured in the first program.

3. Peace Vector-IV

In addition to the Peace Onyx program, TAI produced 46 F-16 fighters with a new program Peace Vector-IV for the Egyptian Air Force between 1993 and 1995 under an agreement signed between the governments of Turkey, the U.S.A. and the Republic of Egypt. This program is significant as it was the first delivery of F-16s to a third country from a manufacturer outside the U.S. (Ilbas, 2002, p. 59).

4. Peace Onyx-III

The Turkish and United States governments signed a letter of offer and acceptance on April 26, 2005 for the $1.1 billion modernization of Turkish Air Force F-16s to a common avionics configuration. In line with an earlier government-to-government agreement between the Turkish and the United States, the Pentagon on December 22, 2006 awarded the $635.1 million contract to Lockheed Martin to upgrade the TUAF F- 16 fleet[39]. Lockheed Martin has to perform its offset commitments until 2016.

The deal will be executed with oversight from the U.S. Foreign Military Sales (FMS) program, with Lockheed Martin in Ft. Worth, TX serving as principal contractor, with the actual modification of the aircraft performed by TAI. The contract is for modification of 76 F-16 Block 50, 103 F-16 Block 40, and 37 F-16 Block 30 aircraft for TUAF. The agreement also includes flight testing, training, technical support and sustainment activities that continue the work started under the initial contract signed in July 2005.

[39] Defense News http://www.defensenews.com/ (Accessed 19 October 2008).

Although, some Turkish politicians brought up questions about the work that could have been done locally by TAI, economic and financial realities may not support these political ambitions. Sometimes more local industry work share means a higher overall price and delays in deliveries. Besides, there are some practical limits on the work share in programs related to technological or financial capabilities. As a result, the best solution for the country can be offsets, as seen in the Peace Onyx-III program. Work share for the rest depends on negotiations and trade-offs made by both parties.[40]

TAI completed a total of 152 Block 30/40 F-16C/Ds for TUAF (plus 8 delivered directly from the USA) under the Peace Onyx-I; 80 Block 50 F-16C/Ds (68 Cs and 12 Ds) under the Peace Onyx-II; an additional 34 Block 40 Cs and 12 Block 40 Ds built for Egyptian Air Force; and finally modification of 76 F-16 Block 50, 103 F-16 Block 40, and 37 F-16 Block 30 aircraft for TUAF. The total production is 278 F-16C/Ds for TUAF, 46 aircraft for Egypt.

The Turkish military achieved modernization at a relatively low price, but the true cost of the Peace Onyx story in terms of industrial competiveness and relations with the United States remains undetermined. For example, the F-16 offset agreement created a significant number of job opportunities for the national defense industry, as well as high level education and training for personnel. As a result, Turkey gained a quality labor force for its national defense.

Turkey also gained very important industrial complexes, TAI and TEI, for its defense industry. In addition to assembling the F-16s, TAI manufactured the aft fuselage, center fuselage, and wings in Turkey. In this regard, the F-16 offset agreement introduced new technologies and export opportunities to Turkish defense industry. TAI produced 46 F-16 fighters (Peace Vector-IV program) and sold them to the Egyptian Air Force between 1993 and 1995. TAI's experience includes not only the F-16 Fighting Falcon but also the CN-235 Light Transport Aircraft, SF-260 Primary Trainer, AS-532 Utility

[40] For complete article see Defense News at: http://www.defensenews.com/story.php?F=2476542&C=america (Accessed at 25 September 2008).

Helicopter, plus development of Unmanned Aerial Vehicles (UAV-X1), Target Drones, Fighter-Surveillance Aircraft, Agriculture Aircraft and modernization activities[41].

In addition to component manufacturing, TEI benefited from establishment of depot level maintenance capability for miscellaneous engines and training received in critical defense fields. TEI has met all its delivery and quality commitments and is now producing parts for over 17 aircraft engines, as well as gas turbines for customers in the United States and Europe. TAI and TEI are good examples of working partnerships created by offset applications.

Today, these factories are providing support for some current offset programs — including research, development, design, training, and servicing. The Turkish military achieved modernization at an affordable price — due to the success results of offset agreements. Also, a number of direct and indirect benefits have been realized, such as technology transfer, good international reputation, and new job opportunities in the Turkish national defense industry.

C. A400M TRANSPORT AIRCRAFT PROJECT

The A400M program is a direct result of a commonly expressed need by eight European air forces[42] for a new generation military airlifter. The A400M initiative aims to specify and procure a common aircraft is unique in European experience, and clearly points the way forward for "smart procurement" on a multinational scale. A consortium of European NATO members issued a Request for Proposal (RFP) in September 1997; to the response industry was the creation of the partnership now known as Airbus Military.[43]

Turkey's intention is to replace TUAF's aging transportation fleet of C-160s with A400M. The A400M is the first truly new military transport aircraft of its category in over 30 years; it has twice the capacity and twice the payload of current aircraft types,

[41] For more information see TAI website http://www.tai.com.tr/en (Accessed 20 October 2008).

[42] Italy withdrew from program in 2003 leaving 7 European countries as partners.

[43] For more information on Airbus Military visit http://www.airbusmilitary.com/home.html (Accessed 5 October 2008).

Even though offset agreements are not present in the A400M project, industrial participation leads to same basic results. Incentives for participating countries include compensation for the amount paid for the project, technology transfers, development and sustainment of the defense industry base, etc. The A400M program is considered to be an important step towards the integration of the Turkish industry into the European aviation industry.

In May 2003, the contract, worth some 20 billion Euros, was signed between Airbus Military and OCCAR (Organisation Conjointe de Coopération en Matière d'Armement – Organization for Joint Armament Cooperation), representing Belgium, France, Germany, Luxembourg, Spain, Turkey, and United Kingdom for a total of 180 aircraft. In April 2005 South Africa ordered 8 aircraft, followed in December 2005 by a contract signed with Malaysia for 4 aircraft. Both nations became A400M program partners, bringing the total commitment to 192 aircraft. Airbus Military has rolled out the first complete A400M military transport aircraft from the Final Assembly Line facility in Seville, Spain on June 26, 2008[44].

Overview: Designed to meet a recognized requirement for a new European airlifter, the A400M incorporates state-of-the-art materials. Features such as electronic flight controls, carbon composite structures and an automated handling system will bring new standards of operability and safety to military aircrews.

Launched under a single contract in 2003 with 180 orders from seven European launch customers, the A400M represents the most ambitious military procurement program ever undertaken in Europe. As noted above, the launch customer nations—Belgium, France, Luxembourg, Germany, Spain, Turkey and the United Kingdom —were subsequently joined by Malaysia and the Republic of South Africa.

[44] The first flight of the Airbus A400M military transport plane will be delayed indefinitely. The first flight will have to wait until the engines, made by EPI Europrop International GmbH, are finished. http://www.aviation.com/business/080925-airbus-a400m-delay.html (Accessed 1 December 2008).

Figure 4. Participating countries and their orders for A400M (From www.eads.net)

The A400M project originated in 1983 when Aérospatiale, British Aerospace and Lockheed came together to form FIMA, the group originally responsible for studying the Future International Military Airlifter. In 1985 after the defense ministers of the Independent European Program Group (IEPG) agreed to harmonize their national requirements in a joint study, the IEPG became FLAEG, the Future Large Aircraft Exploratory Group. Two years later, in 1987, Aeritalia (now Alenia) and CASA joined FIMA as the FLEAG drew up the Outline Staff Target. In 1989 Lockheed withdrew from the program, FIMA was disbanded and the organization was re-established as EUROFLAG.

With EUROFLAG set up as a limited liability company in Rome in 1991, the FLA program progressed through pre-feasibility and feasibility studies in order to meet the European Staff Target (EST) issued by FLAEG. With this phase completed, EUROFLAG was dissolved in 1995 and the program placed under the responsibility of the Airbus Military core team in Toulouse as the European Staff Requirement was finalized by the participating nations.

In 1996, a single-phase commercial approach was presented to the participating nations and the ESR was issued, followed by a Request For Proposals (RFP) from seven NATO nations. In January 1999, the FLA became the A400M with the establishment of Airbus Military Company S.A.S, the organization that presented the full technical and commercial proposal for the aircraft to the MoDs as a response to the RFP.

In December 1999, the nations decided in favor of the Airbus Military proposal and designated the A400M as their future large military transport aircraft. Successive announcements by the partner nations followed during the year 2000 as budgets were put in place, parliamentary procedures expedited, and commitments to aircraft numbers announced. It was agreed in June 2001 that OCCAR would be the contracting body acting collectively for the nations in contract negotiations and in December of the same year a contract was signed between Airbus Military and OCCAR.

Organization: Airbus Military was established in January 1999 to manage the European A400M military transport aircraft project. The company was re-structured under its current name, Airbus Military SL (Sociedad Limitada) prior to the contract signature in May 2003. Its shareholders today comprise AIRBUS, EADS, TAI of Turkey and FLABEL of Belgium.

Airbus Military is the prime contractor for the A400M program and represents the single point of contact between the customers and industry. It holds the contractual responsibility to honor price proposals, performance guarantees and delivery dates.

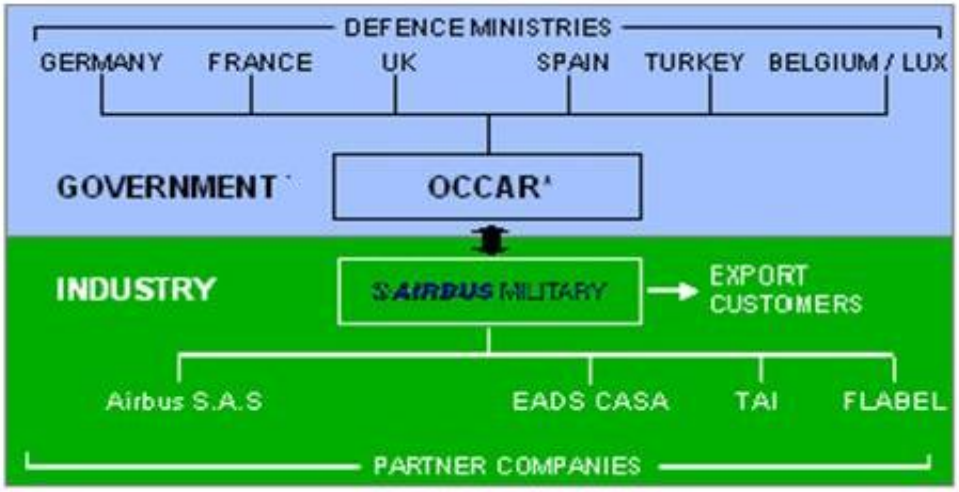

Figure 5. Organizational relationship of participant countries and industrial companies (From Airbus Military website www.airbusmilitary.com)

As the Prime Contractor for the A400M Program and the Customer Interface, Airbus Military is also responsible for commercial activities including marketing, sales and contract administration; financial and administrative activities including cash management; procurement activities including the power plant and coordination for systems; and overall development program management.

Contract administration is handled jointly on behalf of the customer nations by the European central procurement agency OCCAR. For A400M orders from export customers, contracts will be established on a bi-lateral basis between the nation concerned and Airbus Military.

All activities related to A400M project conducted by OCCAR are reported to Program Committee consisting of representatives from 6 establishing members[45]. A400M program members who are not a member of OCCAR — only Turkey – are ensured to attend program management, establish legal, administrative and financial relations with OCCAR by the means of memorandum of understanding signed by participant countries. (Teker, 2006, p. 46)

[45] Belgium (7 aircraft) and the Luxemburg (1 Aircraft) are represented as one country in Program Committee.

The industrial responsibilities of the partners are presently distributed in a manner similar to the Airbus partnership. Aircraft sub-assemblies will be manufactured by the partners at different sites across Europe and delivered to the EADS Spanish facility in Seville for final assembly. Each participant is responsible for its own centre of competence and benefits from a percentage of the aero structures work-share in direct relationship to the number of aircraft ordered by its national government.

Country	Number of Aircraft	Work-Share (%)
Germany	60	33.33
France	50	27.78
Spain	27	15.00
UK	25	13.89
Turkey	10	5.56
Belgium*	8	4.44
Total	180	100

Table 6. A400M Participant countries and their work-shares

Turkey as a participant country: Under the A400M program, a total of 10 A400M aircraft will be procured for the Turkish Air Force Command. To compensate for the 10 A400M aircraft to be procured by Turkey, TAI will undertake a work-share of 5.56%. The structural work share which is corresponding to 7.15% of the total work and systems work package, which is 1.26%.

As a partner of Airbus Military S.L., TAI has participated throughout the A400M project in the design and development activities with the leading European aerospace companies — Airbus (France, Germany, Spain and UK), EADS CASA (Spain) and FLABEL (Belgium).[46]

[46] For more information on TAI and its participation in A400M project visit http://www.tusas.com.tr/en (Accessed 1 October 2008).

Since participant countries receive proportional work-shares for A400M program, traditional offsets are not present. However, participating countries that incurred the initial investment and non-recurring R&D costs will be able to get a share from the sales to other countries after 60th aircraft. Therefore, TAI and SSM expect to benefit from this program in various ways, including positive ROI (Return on Investment), job creation, capability development, sustainment of indigenous defense capabilities and technological spin-offs.

With this program, TAI has shifted to "build-to design" method from "build-to-print." Being a partner of Airbus Military S.L. (AMSL), TAI will not only own design rights, but also become a partner of Design Organization Approval under AMSL — which has design rights, in general, and type certificate. These approvals will make TAI a company that has control over all processes including design, test, certification and delivery.

As a risk sharing partner in the program, TAI will manufacture the parts under its responsibility for each new aircraft order. The parts, which are the responsibility (design & production) of TAI are forward center fuselage, rear fuselage upper shell, parachute doors, emergency exit doors, tail cone, lightning and water/waste systems and aileron and spoiler.

Special technology, know-how and experience is required for production of composite structural elements — which are more endurable and lighter compared to aluminum alloy material. The first A400M spoiler and aileron components are the largest composite parts, and are produced at TAI's facilities. The A400M flight control surfaces are also the first components to be certified under TAI's responsibility by the "International Certification" authorities.

In addition to structural components, TAI is Level 1 responsible of the lighting and water/waste systems of the A400M program. Furthermore, the fuselage harness fitting of the A400M is also manufactured by TAI engineers.

TEI, a share holder of EuroProp International[47], has a work-share of 2.45% in the engine design and production of A400M. TEI is responsible for manufacturing the front bearing structure, primary nozzle, and special testing equipment for TP400 engine. TEI is the only company to design and manufacture these parts. (Teker, 2006, p. 46)

A400M is a highly important project. As stated by Oktay Tezsezen, general manager of TAI, it is the first global project with Turkish defense industry fully involved in design, development, and production and after sale support processes. Turkish defense and aviation industries will benefit from technological build-up, added domestic value, export potential, and employment opportunities. The A400M program is an important step towards the integration of the Turkish industry into the European and global aviation industry.

D. JOINT STRIKE FIGHTER PROJECT

The Joint Strike Fighter (JSF) project — involving both country-to-country and industry-to-industry relations— is unprecedented both in its scale and international character. The project is currently in the System Development and Demonstration (SDD) phase. The overall process, by its nature, does not involve offset commitments. Rather, "best value" is the basis for supplier evaluation in all phases of the project. Nonetheless, JSF is discussed in this chapter for two reasons. First, aviation is one of the most important instruments of national power, alliances, and defense industry capabilities.Therefore, JSF may provide insight into the future of several issues discussed in this study, such as arms trade and offset projects.

Second, the partner countries' incentives for joining the project (at the non-operational side) have parallel characteristics to those gained with an offset commitment such as compensation of the amount paid for the project, technology transfers, development and sustainment of the defense industry base, etc.

[47] EuroProp International is a consortium company formed by Europe's engine manufacturers, and is responsible to design and manufacture the engines A400M's project. TEI joined this project with Spanish ITP company. (Teker, 2006, p. 46).

Program Overview: The JSF program emerged in late 1995 from the Joint Advanced Strike Technology (JAST) program, which began in late 1993 as a result of the Bottom-Up Review (BUR) of U.S. defense policy and programs. Having affirmed plans to abandon development of both the A-12/AFX aircraft that was to replace the Navy's A-6 attack planes and the multi-role fighter (MRF) that the Air Force had considered to replace its F-16s, the BUR envisaged the JAST program as a replacement for both these aircraft. In 1994, the JAST program was criticized by some observers for being a technology-development program rather than a focused effort to develop and procure new aircraft. In 1995, in response to congressional direction, a program led by the Defense Advanced Research Projects Agency (DARPA) to develop an advanced short takeoff and vertical landing (ASTOVL) aircraft was incorporated into the JAST program, which opened the way for Marine Corps and British Navy participation. (CRS, 2007, 2)

The JAST program office released a request for proposals in March 1996. Shortly thereafter, the project name was changed to Joint Strike Fighter to focus on joint development and production of a next-generation fighter/attack plane. Three groups responded to the request: a McDonnell-Douglas-headed team joined by Northrop Grumman and British Aerospace (later absorbed into BAE Systems), a Boeing team, and a Lockheed Martin team. Later in 1996, the concepts submitted by Lockheed Martin and Boeing were chosen as finalists, and both firms started work on a demonstration aircraft. In October 2001, the X-35 of Lockheed Martin was declared the winning entry. Apparently the race was close, but Lockheed Martin's design was viewed as the less risky alternative. (Franck, Lewis and Udis, 2008, p. 70) Thus, the prime contractors of the program are Lockheed Martin, Northrop Grumman, BAE Systems, Pratt & Whitney and Rolls-Royce[48]; an international team leaded by Lockheed Martin. Final assembly of the aircraft will take place at Lockheed Martin's Fort Worth plant in Texas.

Three versions of F-35 aircraft are being developed: Conventional Take-Off and Landing (CTOL or F-35A), Short Take-off and Vertical Landing (STOVL or F-35B) and

[48] Early production lots of all three variants will be powered by the Pratt and Whitney afterburning turbofan F-135 engine. Following production aircraft will be powered by either the F135 or the F-136 turbofan being developed by General Electric and Rolls-Royce. http://www.airforce-technology.com/projects/jsf/ (Accessed 14 October 2008).

the carrier Version (CV or F-35C); Turkey is interested in the CTOL version. The guiding principles of the JSF in design are advanced weapon systems[49] and affordability[50].

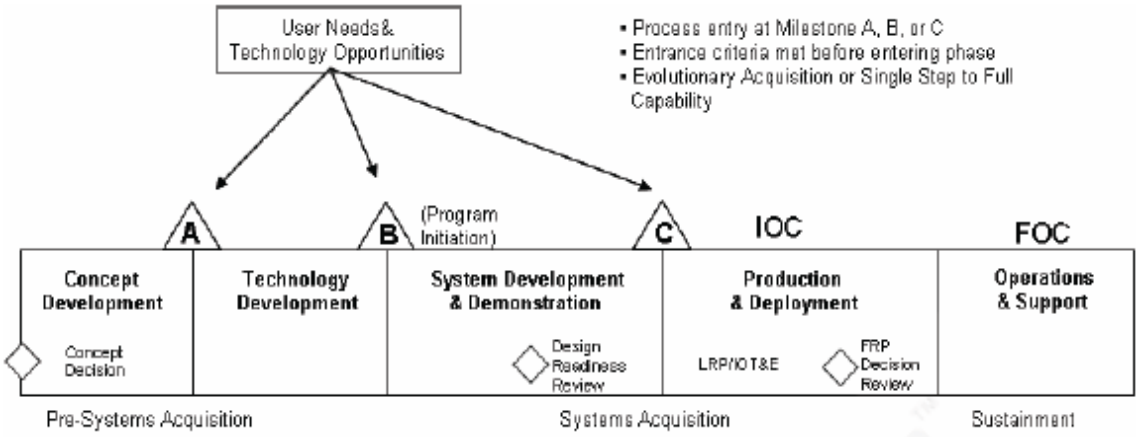

Figure 6. Defense Acquisition Management Framework (from CRS, 2007, p. 7)

The project is currently in the SDD phase. Until late 2003, the JSF program's SDD phase was scheduled to run until 2008, at which time full rate production was scheduled to begin, with a projected initial operational capability of 2010. However, schedule changes have added time and cost to the program. (CRS, 2007, p. 7, emphasis added) Excessive weight problems[51] were the most significant among those experienced

The overall program is planned to produce over 3000 aircraft for U.S. and partner countries at a cost of over $200 billion. However, over 5,000 aircraft are expected —

[49] The report of Franck, Lewis and Udis provides detailed information about the design parameters of the aircraft. Also see http://www.airforce-technology.com/projects/jsf/ for a detailed explanation of JSF design parameters.

[50] A main goal of the program from the U.S. perspective has been to find further ways to reduce costs, given the shrinking defense budgets and increasing price of high technology component. The focus of the program is affordability - reducing the development cost, production cost, and cost of ownership of the JSF family of aircraft." In order to achieve this welcome set of goals, commonality among the services was essential, and the aircraft is now set to replace F-18 C/D's of the Navy and Marines, AV/8B Harriers of the Marines, and F-16 and A-10 fighters from the Air Force. Current plans call for 2,458 aircraft in three different versions, but with 70-90% commonality of components and systems to reduce manufacturing costs. (Reinhard, 2006, 79).

[51] To address growing weight problems encountered in the development phase, DoD extended the SDD phase one year, and correspondingly delayed the F-35's scheduled first flight from late 2005 to the summer of 2006 (first flight occurred on December 15, 2006), and the beginning of low-rate initial production shifted from 2006 to 2007. (CRS, 2007, p. 7).

including FMS sales. It is the largest defense project yet undertaken. Procurement is planned to continue until 2026 (and beyond) with a possible service life through 2060 (or beyond).

Organization: The JSF program involves international participation and unlike recent programs, such as F-16, this participation begins with the early stages rather than the production phase.

According to Kapstein, the industrial structure (and the organizational structure in effect) of the JSF program is a reflection of the market realities at the time project was initiated. International collaboration in the JSF program was primarily driven by an American concern with capturing foreign market share at a time when domestic defense procurement budgets in the U.S. as well as the defense budgets worldwide were rapidly falling and the European defense companies were more competitive[52] in international arena. From this point of view, JSF's promise of promising jobs and technology transfers would make the project politically attractive.

A 2003 GAO report defines the underlying incentives of the program's participants in a more detailed way. Through negotiated agreements with partner countries which define specific roles and responsibilities for participants, the United States expects to benefit from sharing program costs, gaining access to foreign industrial capabilities, and improving interoperability with allied militaries. Partner governments expect to benefit through defined influence over aircraft requirements and improved industrial relationships with U.S. aerospace companies through access to JSF contractor and subcontracting competitions. Finally, a major benefit for partners is having their personnel physically located within the program office with access to program information and contractor data. (GAO, 2003, p. 1)

[52] In fact, the affects of globalization and ongoing RMA, those defined in the first chapter of this study, are the key issues for the increasing competitiveness among defense firms worldwide. The European defense firms- Britain's BAE SYSTEMS and the Franco-German firm EADS- were more powerful rivals as a result of mergers and acquisitions in a climate where companies had to put more emphasis on international arms trade for sustainment. At the same time similar projects were initiated such as Swedish Gripen, French Rafale and multinational Eurofighter.

The strategy involves three levels of partnership arrangements and a Security Cooperation Participation level utilizing foreign military sales procedures. (Schreiber, 2002, 165) Participation of a country in an early level of the program does not guarantee participation in the further phases or purchasing the aircraft.

Responding to the coming Air Force requirement for a new-generation fighter to replace the existing F-4 and F-16 fleet beyond 2012, Turkey joined the Concept Demonstration Phase (CDP) of the JSF Program in 1999 and signed the international memorandum of understanding (MOU)[53] document for the SDD Phase in 2002 as a 3rd level participant, with an amount of 175 Million USD. Further, on 12 December 2006, the Defense Industry Executive Committee selected F-35 as the Turkish Air Force's future combat aircraft and decided to participate in the JSF PSFD (Production, Sustainment, and Follow-On Development) Phase by signing the PSFD MOU. The MOU document has been signed by Minister of National Defense Vecdi GÖNÜL on 25 January 2007 at The Pentagon and approved by Turkish Parliament (TBMM) on 27 March 2007. (SSM, 2008) The other participant countries and their contributions to the project are shown in table 7.

	System development and demonstration			Production	
Partner country	Partner level	Financial contributions (in millions)[a]	Percentage of total costs	Projected quantities	Percentage of total quantities
United Kingdom	Level I	$2,056	6.2	150	4.7
Italy	Level II	$1,028	3.1	131	4.1
Netherlands	Level II	$800	2.4	85	2.7
Turkey	Level III	$175	0.5	100	3.2
Australia	Level III	$144	0.4	100	3.2
Norway	Level III	$122	0.4	48	1.5
Denmark	Level III	$110	0.3	48	1.5
Canada	Level III	$100	0.3	60	1.9
Total partner		$4,535	13.7[b]	722	22.8
United States		$28,565	86.3	2,443	77.2

Table 7. JSF Partner Financial Contributions And Estimated Aircraft Purchases (From GAO, 2003, p. 10)

[53] These agreements identify the roles, responsibilities, and expected benefits for all participants and are negotiated for each acquisition phase. (GAO, 2003, p. 7).

As shown in Figure 7 the levels of participation facilitate Government-to-Government arrangements as well as continuation of Industry-to-Industry relationships initiated in the early phases of the program.

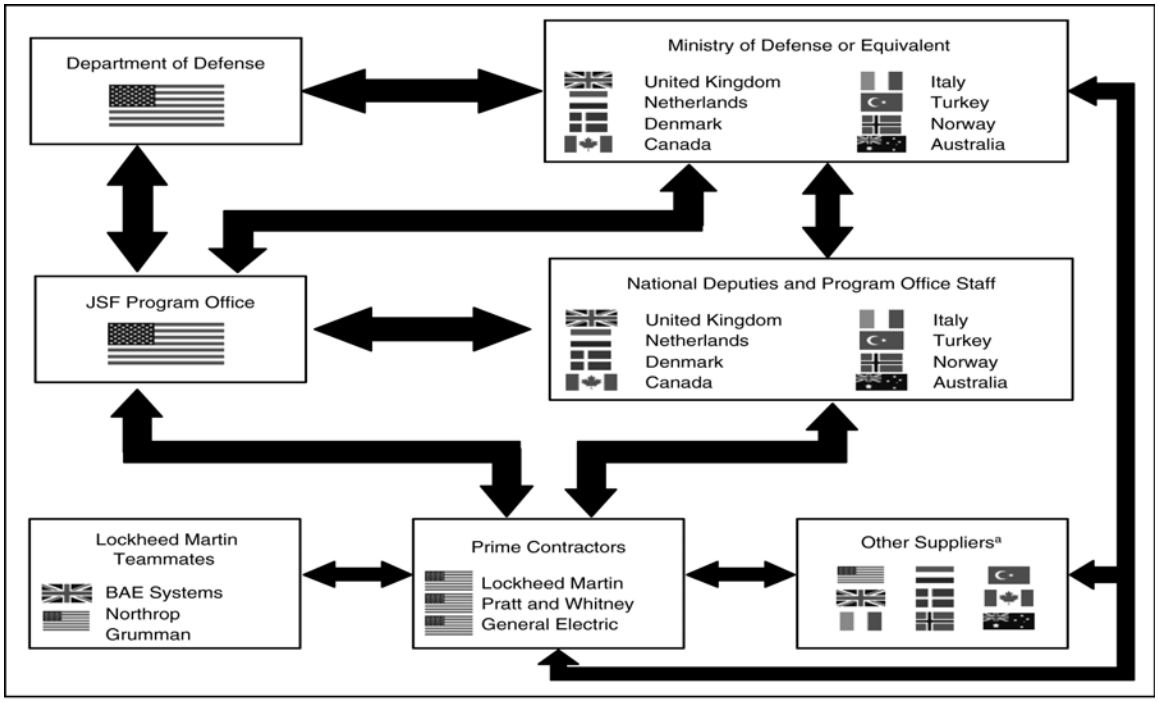

Figure 7. JSF Program Relationships (From GAO, 2003, p. 7)

The benefits derived by Partners at each of three JSF partner levels are directly proportional to their investment. At the government-to-government level, the applicable non-recurring R&D cost recoupment charge[54] for each aircraft purchased is waived for level 1 and level 2 partners, and for the level 3 partners the amount of their investment is credited toward their applicable non-recurring R&D cost recoupment charge and the remainder will be considered for waiver on a case-by-case basis … Also, proportional to the amount of a partner country's SDD investment, Partners will share third party levies on the JSF aircraft produced for Foreign Military Sales customers. (Schreiber, 2002, 166)

At the same time, the representatives of the partner countries, assigned to different Integrated Product Teams within the JSF program office, act like an interface between the

[54] R&D cost recoupment charge relates to demanding that foreign buyers pay their 'fair share' of a project's R&D costs – for foreign military sales, providing export weapons with a direct subsidy from U.S. taxpayers. (Kapstein, 2004, p. 149).

program office and ministries of defense. Level III partners have one program office staff member and no direct vote with regard to requirement decisions.

At the industry level, the strategy is formulated for international competition rather than directed country workshare or offsets for affordability and best value reasons. After deciding to award work to foreign and domestic companies based on competition, instead of cost shares contributed, DOD and the JSF Program Office have left implementation approach to Lockheed Martin under the standard Federal Acquisition Regulation clause related to competition in subcontracting. (GAO, 2003, 23) The same report states[55] that Lockheed Martin's approach for supplier selection is based on factors such as a supplier's ability to incorporate a management approach that is responsive to maintaining JSF schedules, reducing design and production cost within acceptable risk levels, developing a solid technical approach with opportunities for technology improvements, reducing aircraft size and weight, and increasing aircraft performance. Another major point is based on the fact that this approach is being implemented without regard to a supplier's country of origin, with U.S. and international suppliers competing equally.

Based on a 2003 report by DoD regarding the industrial participation in JSF project, 55% of the total value of the JSF work in the SDD phase will be subcontracted and a further 15% is expected to be subcontracted once the fighter goes into production. Also global sustainment of the F-35 Aircraft will be globally executed via Autonomic Logistic Global Sustainment (ALGS) System, and will be centrally managed by the U.S. Government and Lockheed Martin as the single point of accountability. The scale of work and economic opportunities offered to potential suppliers, the project aims for win-win outcomes.

However, a diverse set of challenges related to the international character of the project have been experienced, and it is reasonable to predict more throughout the project life based on a vast range of political and industrial issues.

[55] Based on the interviews with Lockheed Martin officials..

Three of the problems, as stated by GAO (2003), are the most significant. First, while international partners can choose to share any future program cost increases, they are not required to do so under the terms of the negotiated agreements. Further, they have not been required to contribute any additional funding despite changes to the scope of the program. From this point of view, the recent changes in the cost and schedule added complexity to the program management. Second, technology transfer issues also present challenges for the JSF program. Due to the degree of international participation at both a government and an industry level, a large number of export authorizations are necessary to share project information with governments, solicit bids from partner suppliers, and execute contracts. Finally, while the JSF Program Office is responsible for ensuring that program objectives are met for all participants, Lockheed Martin bears most of the responsibility for managing partner industrial expectations. Partners have identified industrial benefits as vital to their participation in the program. If return-on-investment expectations are not met, the program is likely to lose political support in the partner countries. To realize this return, a partner industry must win JSF contracts through competition, which is a departure from other cooperative programs. In one sense, this is a contradiction with the program goal of avoiding offsets. Although international collaboration aims to create a free-trade environment, the expectations of the partner countries and program execution must be balanced. This might lead to reciprocity — promising work to guarantee the further participation;, this sounds like an offset transaction.

Turkey as a partner country: Prior to signing the PSFD MOU, Turkey had all options open for the country's next-generation fighter: JSF only, Eurofighter only, or a combination of both. The F-35 program was chosen to get the most value at the lowest cost. Partnership status was desired because of positive impacts expected for the Turkish military industrial base. This impact is expected to be realized in various ways, including positive ROI, increased national value in acquisition, job creation, capability development, and technological spin-offs.

The industrial return target is determined as "minimum 50%" in the JSF project that is going to cost Turkey approximately $10.7 billion with a projected procurement

amount of 100 F-35A aircraft. (Bayar, 2008, 22) However, Turkey lacks a large, fully-developed aerospace sector and has a limited number of defense companies listed on the Global Project Authorization (GPA)[56] signed.

Nevertheless, Turkish Defense Industry has gained significant capabilities with the previous defense projects managed by SSM in the recent twenty years. By 2008, the overall requirements of Turkish Armed Forces are provided through domestic industry capabilities at 41.6% level. Also, export capabilities of the industry have increased[57] as a result of the design and development projects employed from the beginning of 2000s.

SSM has used various support mechanisms to help Turkish defense companies identify, bid for, and win contracts from the very beginning of the project life. The JSF Turkish Industry Coordination Team, assigned by SSM, is in charge of enhancing the communication between the Turkish companies and JSF top-tier contractors and following the nearing opportunities in the Program. This group coordinates and connects the respective points of contact within both groups. Furthermore, SSM has provided $325 Million of funds to help qualified domestic defense companies improve their infrastructure. At the same time, a strategy has been initiated by the joint efforts of SSM and Turkish Air Force to ensure the use of domestic military and civilian capabilities for the sustainment of the system in the ALGS framework.

Currently (2008) industrial participation for the next 25 years has reached $5.5 Billion. The major portion of this work belongs to TAI; the second tier supplier of sub-assemblies for the centre fuselage at a monetary value of approximately $3 Billion. At the same time, seven Turkish defense companies, including TAI, have been granted work for the project. However, the workshare is not at the desired level for electronics and

[56] A GPA is conducted under a Government-to-Government agreement or a Defense-to-Defense MOU, between the U.S. and a foreign country. Eligible end users are the Defense Departments of the U.S. and the foreign country, and companies serving as their sub-contractors. The GPA allows pre-qualified U.S. firms to enter into Implementing Agreements (see below) with pre-qualified JSF foreign partner firms, for exchanges within the approved scope of the GPA. It can cover a broad range of defined activities, including multiple shipments, extended periods of defense service support, and re-exports http://www.innovation.gov.au (Accessed 28 October 2008).

[57] Defense exports between 1997 and 2007 were approximately $3Billion. While the total exports were $138 Million at 1997, it increased to over $350 Million at 2006 and $420 Million at 2007. (Bayar, 2008, p. 23).

software related contracts. The projected amount of $1 Billion for ASELSAN, one of the key players of Turkish defense industry, has not yet been reached. Thus, this will be one of focus areas for the industry related efforts at the near term. (Bayar, 2008, p. 22)

Discussion of Turkey's defense related offsets should emphasize the country's efforts to improve its defense industry. As discussed earlier, offsets are not used as a finance tool to compensate for the cost of major weapon system acquisitions. Rather, offsets are considered as complementary[58] in a toolbox of indigenous projects, R&D oriented programs, acquisition reforms and joint ventures. These are all intended to further the development of the domestic defense industry as well as making that industry a key international player.

According to Murat Bayar[59], Turkish Defense Industry has completely matured its views regarding indigenous development; thus the SSM goals for procuring major systems include initiating indigenous projects for enhancing critical industrial capabilities. If indigenous projects are not cost effective or feasible, the second choice is joint development, perhaps with multinational collaboration. Finally, co/licensed production and other offsets (in order to gain workshare) will be the demanded when those priorities cannot be met. This tendency can be observed through the following speech[60] taken from an international conference (regarding Indigenous Solutions to TAF's Future Requirements) sponsored by SSM.

> In today's world, developed countries are more focused on the indigenous solutions, mutual development and international cooperation projects to meet their defense weapon systems requirements. Depending on the experiences regarding the foreign dependency and being aware of the benefits of the indigenous or joint development models for Turkey, buy off the shelf and co/licensed production models are being diminished. Indigenous development projects (of Turkey) like Trainer A/C and Unmanned Air Vehicle Development projects, joint development

[58] As stated in a 2005 conference (Offsets in Turkish Defense Procurements) sponsored by SSM at 24 May 2007, offsets have been a facilitator for the defense offsets. Nevertheless, the new challenge was introduced as "export without offsets" in the same conference.

[59] Chief Executive of SSM.

[60] This speech comes from Ahmet Metan, the Business Development Director of TAI.

programs such as Europe's Transport Aircraft A400M and NATO-AGS and international participation projects as Joint Strike Fighter can be considered as a leading model for this tendency.

Therefore, it is assessed that it is going to be more beneficial for us to participate actively and on time in joint projects initiated mainly by U.S.A and EU and other countries while both developing indigenous solutions and meeting large volume development costs and time. Other than this, seeking the international participation to the Turkish development projects should be evaluated as an alternative target as well.

E. SUMMARY

The F-16 project, as Turkey's first major offset implementation, displays all the Turkish government's objectives for offsets in early stages, such as cost compensation, establishment of key defense companies like TAI and TEI, creation of new employment opportunities, technology transfer, and export capabilities.

The JSF and A400M projects reflect a greater maturity of the Turkish defense industry and offset implementations, in accordance with the revised offset policies and strategic goals. To that end, these two projects can be seen as mechanisms to improve capabilities of the national defense industry as well as integrating that industry into the international arms trade.

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VI. CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

This chapter provides a summary and conclusions regarding Turkish offset policy; its current state and recommended directions for future development. To that end, this chapter includes an overall summary of the offset literature; offset policies of selected countries when appropriate; history and development of Turkish offset policy; and analysis of selected Turkish weapon system acquisitions. We conclude with areas for further research.

A. SUMMARY AND CONCLUSION

Offsets are a form of reciprocal trade and may take place in the arms as well as commercial trade. However, offsets are the norm in international arms trade, especially in major weapon system acquisitions that feature high cost and technology. Over 130 countries use offsets and most of them have highly-structured offset policies which impose contractual requirements on international procurements. The goods and services involved in offset transactions are limited only by the imagination of the parties involved. Therefore, the terms and definitions for offsets are not consistent among the various authorities, and the subsequent discussion of defense offsets should be placed within the wider context of reciprocal sales agreements.

The three defining conditions for an offset have been defined as purchasing government involvement, supplier reciprocity and preferential treatment. First, purchasing government involvement is an intervention through laws or public policy, as well as seeking scrutiny of offset transactions during the approval processes. Second, supplier reciprocity refers to the contractual requirements of the buying country — which specify the forms of additional as a prerequisite for contract award. Finally, preferential treatment goes to the supplier that meets the offset requirements.

Two other general concepts for an activity to be counted as an offset are additionality/incrementality and causality. Thus, the activity must be in addition to the

activity that the offset obligor is already performing in the country and the project must have been one that came about because of the offset obligor's efforts.

Offsets are closely related to international trade practices. International trade concepts are useful starting points for understanding any given offset arrangement. However, economic realities and political mechanisms cause international trade practice to differ from standard international trade theory. Moreover, since military offsets involve national security, they are not subject to WTO rules.

Each country can be allocated to one of three groups based on giving and receiving offset work. First, there is the U.S. that largely exports equipment and thus only gives offsets[61]. Second, there is the small number of states that both import and export armaments and thus both give and receive offsets. France, Germany and the UK, for example, fall into this category. Finally, there is the large number of states that largely import defense equipment and who thus only receive offset work. Developing countries form the majority of the last group.

The incentives for receiving and giving offset work are diverse. The seller country uses offsets for channeling work or technology, gaining market share and some form of political reasons such as forming and enhancing alliances. Buyer countries are utilizing offsets (both military and commercial) that involve transfer of technology and know-how for acquiring new technologies and capabilities; establishment of a national defense industrial base; increasing self-sufficiency; reducing trade deficits; creating employment and production possibilities for domestic labor and industry; creating and increasing competitiveness of domestic industry; enhancing alliance cohesion; and responding to political concerns. These factors have different effects over time depending on environmental developments.

Offsets are complex and dynamic; therefore offset policies are continuously revised based on the economic and political developments — as well as previous experience. Declining military budgets, the effects of globalization (such as mergers and

[61] However, there are some exceptions for the U.S.. For example, there's (a) the matter of licensed production (e.g., Harrier) and (b) the offset packaged offered by NG-EADS in their KC-45 proposal.

acquisitions); and increasing competition for major, high-technology firms accordingly increased the bargaining positions of the developing nations. The result increased use of offsets. Additionally, the ongoing RMAs brought new defense firms into the global market. Overall, offset policies are continuously being revised both by the developed and developing nations.

1. Turkish Offset Policy Development

Turkey was mostly reliant upon foreign aid from U.S. and NATO to meet the requirements of armed forces, and did not have any major defense industrial companies until the 1980s. After the deadlock subsequent to the arms embargo following the Cyprus Peace Operation reminded Turkey of the necessity to establish and develop a national defense industry. Accordingly, state initiatives were undertaken to realize the modernization of the Turkish Armed Forces and to establish a national defense industry. New legislation (Defense Industry Law, Law no. 3238), new organizations (SSM) and new practices (increased use of offsets).

Additionally, some important capabilities have been realized through these projects and industrial activities. These include technology infrastructure, export capability, strengthen3e sub-sectors, restructured industry, and greater expertise.

SSM, an institution capable of formulating long term policies and principles for defense offsets, is the only Turkish institution authorized to administer defense offsets. SSM was established by legislative passed in 1985. This law stated domestic suppliers should be facilitated to the maximum extent practicable for foreign arms procurements — pointing toward offsets. The main goal of SSM was to develop a modern defense industry in Turkey and to facilitate the modernization of the Turkish Armed Forces. SSM is also responsible for publishing official documents to set guidelines both for foreign contractors and domestic manufacturers. As a result of experiences gained from offset projects and changes within global economy, it was considered necessary to publish official documents to identify the bureaucratic processes and evaluation criteria for offsets, to set guidelines for domestic and foreign companies, and to create a systematic approach for offset applications.

Turkish policy on defense related offsets can be analyzed in three periods.

The first period is from 1984 to 2000. Offsets were implemented as a tool of financing. The main purpose for offsets related to acquisition of F-16's, and the other offset agreements managed by SSM, was to provide compensation for lost foreign exchange. In addition to being regarded mainly as a tool of financing for foreign arms procurements, offsets contributed to development of national defense industry by providing technology and knowledge transfers between 1991 and 2000.

The second period is from 2000 to 2007. Offsets were implemented to develop the national defense industrial base. With the experiences gained from the previous period, SSM focused on selective offset applications — which contributed to the defense industry directly. SSM also undertook to prioritize the offset categories. The main objective was to strengthen the national defense industry base. Accordingly, multipliers were assigned to technology transfer offsets.

The third period is from 2007 to future. Offsets are implemented to increase the competitive power of Turkish defense industry, and to reach the strategic goals of SSM. SSM made significant changes to offsets policy, reviewing it in according to the objectives of "2007-2011 Strategic Plan". SSM emphasized the use of offsets as a critical tool for implementing its strategic plan for the development level of the national defense industry. SSM expanded the definition of offset to include local content and industrial participation.

Presently, SSM encourages cooperation in high technology areas that require a well qualified work force. Emphasis is also on low investment cost in order to have the competitive strength to market and sell end products to other countries.

Future outlook of SSM and its offset policy is stated in "Strategic Plan for 2007-2011". Some of SSM's strategic goals for 2011 related to offsets are: to increase the Turkish defense industry's work share average to 50% in the frame of procurement projects, one billion dollars of export in defense goods and services, to participate

actively in the multinational defenses and security projects that promote the international cooperation, and to participate at least in four multinational defense projects and lead at least to an international project.

2. Selected Major Weapon System Acquisition Projects

F-16 Project: F-16 procurement is Turkey's first significant major offset application. SSM and its offset policies underwent significant development and as a result of this procurement. The first F-16 offset applications started with General Dynamics in 1984 as a co-production and co-assembly program. It has since expanded leading to a number of F-16 offset applications at various levels. After the initial procurement, for which General Dynamics agreed to the assembly of 152 aircraft in Turkey in exchange for the purchase of 160 aircraft. This project became the most important modernization program the Turkish Armed Forces undertook.

The Turkish military achieved modernization at a relatively low financial price, but the true impact of F-16 procurement in terms of industrial competiveness and relations with the United States remains uncounted. For example, the F-16 offset agreement created a significant number of job opportunities for the national defense industry, plus high level education and training for its personnel. As a result, Turkey has gained a quality labor force for its national defense industry, as well as all of the benefits enumerated above.

Turkey also gained very important industrial complexes, TAI and TEI, for its defense industry. In this regard, the F-16 offset agreement introduced new technologies with export opportunities to Turkish defense industry. TAI produced and sold 46 F-16 fighters with Peace Vector-IV program for the Egyptian Air Force between 1993 and 1995

A400M Project: The A400M program is a direct result of a commonly expressed need by European air forces for a new generation military airlifter. The A400M program is considered to be an important step towards the integration of the Turkish industry into

the European aviation industry. Even though offset agreements are not present in the A400M project, industrial participation will likely lead to the same results — perhaps even better in some respects like additional sales.

The industrial responsibilities of the partners are presently distributed such that each participant is responsible for its own work-share, which is determined in direct relationship to the number of aircraft ordered by its national government. Turkey will buy 10 A400M aircraft. To compensate for the 10 A400M aircraft TAI will undertake a work-share of 5.56%.

Being a partner of Airbus Military S.L. (AMSL), TAI will not only own design rights, but also become a partner of Design Organization Approval under AMSL since AMSL has general design rights, and type certificate. These approvals will make TAI a company, that has control over all the processes, including design, test, certification and delivery.

JSF Project: The overall JSF project, by its nature, does not involve offset commitments. Rather, "best value" is the basis for supplier evaluation in all phases of the project. Thus, based on the standard Federal Acquisition Regulation clause related to competition in subcontracting, DOD and the JSF Program Office have left implementation of this competitive approach to Lockheed Martin after deciding to award work to companies (foreign and domestic) based on competition. However, the buyer country incentives have similar characteristics with those gained with an offset transaction.

Turkey joined in the CDP of the JSF program in 1999, SDD phase in 2002 (as a level-III partner) and PSFD phase in 2007 by signing the related MOU documents. On the operational side, the objective was to meet the requirement for a new-generation fighter to replace the existing F-4 and F-16 fleet after 2012. On the industry side, the return was determined as minimum of 50% of the $10.7 Billion cost for a projected amount of 100 F-35A aircrafts. SSM has used various support mechanisms to help Turkish defense companies identify, bid for, and win contracts from the very beginning of the project; the currently expected industrial participation amount for the next 25 years

is $5.5 Billion. Also, various efforts are in effect to further participation of Turkish defense industries,, including sustainment within the AGLS framework.

3. Conclusions

The history of offset policy development in Turkey and our analysis of some major projects, although limited in scope and depth, provide a basic understanding of the current and future state of Turkish offset policy as well as the domestic defense industry.

National security is achieved primarily through military capability. Thus, developing a powerful national defense industry is vital. Turkey was involved in offsets most significantly in the 1980s with the F-16 project. The F-16 project was important in initiating the establishment of some major defense companies such TAI. It is noteworthy that TAI is now a second-tier supplier in the JSF and A400M projects.

Turkish Offset Policy policies have been periodically revised over the past 30 years, and they basically reflect the economic and political developments, as well as Turkish offset program experience. SSM requested offsets for all defense procurements first as a financing tool to compensate for the cost of the system and facilitating the establishment of the defense industry; later on as a tool for developing a defense industry; and still later to reach national security goals.

Measuring the effects of offsets on the economy and the capabilities of the defense industry is difficult. However, in the Turkish case, it can be inferred that the emphasis on offset policies and developments in the defense industry are concurrent.

Based on longstanding strategic goals and recent projects, the future offset policies will be still be oriented towards accelerating the development of Turkish defense industry, and integration of that industry to the global arms trade as a key player.

Specifically, the SSM's preferred method of procuring major systems will involve initiating indigenous projects for the critical areas — as assessed by potential enhancements to required industry capabilities. If indigenous projects are not cost effective or feasible, SSM will seek joint development and/or multinational collaboration projects such as JSF and A400M. The alternative of seeking international participation in

Turkish development projects should be evaluated as well. Finally, co/licensed production or offsets (in order to gain workshare) will be the demanded when the methods are not feasible. From this point of view, offsets in Turkey are considered part of a figurative tool box which includes indigenous projects, R&D oriented programs, and joint ventures, intended to enable reaching Turkish national security goals — both short and long term. It is noteworthy that the incorporation of program management discipline is essential for indigenous solutions to be cost-effective and competitive. Thus, it is vital to ensure the involvement of industry in the process of Turkish defense requirements determination and acquisition planning. It is also important to enhance collaboration with research institutions and universities.

B. SUGGESTIONS FOR FURTHER RESEARCH

This study reviewed offset literature and policies of the selected countries, with a view to analyzing the history and development of Turkish offset policy. We also considered selected case studies. Two of the projects, A400M and JSF are in the early phases and still ongoing. Analyzing the effects of those projects on the Turkish defense industry in accordance with the defense industrial policy initiatives should prove valuable in helping to determine the most advantageous Turkish participation in later stages of those projects.

The effects of offset projects, including commercial applications, on the overall economy would also prove valuable. The recent efforts of commercial offsets should be analyzed in this regard.

Assessment of the realization of SSM strategic goals for 2001 and the role of offsets for reaching those goals would be another interesting area for further study.

Prospective acquisition reforms in accordance with the integration of the defense industry, procurement authorities, and research institutes to the TAF requirement determination process in order to facilitate projected indigenous solutions would also be another useful area for further research.

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