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Exporting the JF-17 Thunder: A way-out for Pakistan

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Abstract *Pakistan is facing a current account deficit. Boosting exports will help reduce the deficit and fetch the much needed foreign exchange. Exports of defense products can provide Pakistan economy with a major boost. The paper presents a discussion on the various benefits Pakistan can have if the defense products such as the JF-17 thunder, which is a multi-role jet fighter produced by PAC Kamra and CAC China, is sold. The research approach as adopted in this paper is qualitative. The possible markets for the Pakistani JF-17 have been identified. The paper recommends that the political leadership should effectively utilize its diplomatic channels in order to secure sales for Pakistan's JF-17's thunder. The successful sale of the aircraft would not only boost our economy but will also make Pakistan rise in the comity of nations.*

Key Words: Aviation Industry, Defense Economics, Defense Exports, Fighter Aircrafts, JF-17.

Introduction

In 2017, Pakistan's real GDP growth was recorded to be 5.6% which is a record high in the past 10 years. The monetary policy statement released by the State Bank of Pakistan (SBP) stressed that the domestic demand for machinery and other imports has increased due to the boom of economic activity in Fiscal Year (FY) 2017; however, the report raised concerns regarding the import-export deficit that has been created because our exports in the given year are unable to match the imports. The SBP monetary policy statement issued on 20th May 2017 states that "*…. Official inflows are expected to provide support to foreign exchange reserves. A sustained increase in other private inflows-Foreign Direct Investments and export earnings, in particular, is required to fully finance the surge in imports……"* Imports surge in the FY17 has been the reason for current account deficit.. the trend continued well into the next year as the SBP mentioned in its report for that year about the imports overshadowing and offsetting the effects of exports. From these reports, it is clear that Pakistan is facing a huge gap between imports and exports that has resulted in a current account deficit passing from one year to the next, and hence there is a dire need to boost exports, among other things. Export of defense products is an important sector in this regard, particularly Pakistan's aeronautical industry can be a very good export choice given its potential and ability to deliver quality products, and if its export potential is fully exploited by the government, it can fetch the country the much needed foreign exchange.

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Defense industry globally is a major contributor to the economic growth of developed countries. Countries, which are economically advanced, have a strong defense industry. The aviation industry has a trillion dollars share. Defense industry in general and the aviation industry, in particular, provide sound foundations for other industries to inform of spillover effects of technology and manpower. Turkey has an aviation industry earning 906 million USD while the USA has 364 billion USD. US Aviation industry earned 89.6 billion USD from its exports in 2010, while this industry is employing 1.05 million people directly and around two million indirectly through induced employment. To dig further, the US Aviation industry thus earns revenue of 302.4 billion USD which is 308,364 USD per employee, out of which the employees paid 38 billion USD as Government taxes (excluding indirect taxes) while the industry paid a total of 14 billion USD in Corporate taxes and sales of the industry contributing 5.2 percent to US GDP. Therefore, there is a dire need to explore the impact of PAC Kamra on aeronautic and avionic aspects and its welfare impact because Pakistan is no exception when the countries mentioned above are highlighted. In fact, for industrial development, the strength of avionics and the aviation industry does matter. Therefore, PAC Kamra has been selected as a case study for the current study.

Among PAC's many products, one of the most notable is the JF-17 thunder. A 3rd. Generation multi-role aircraft developed as a joint venture between the PAC and CATIC (China). The aircraft has the ability to carry air to air, air to ground and air to sea attacks and has state of the art avionics and airframe. PAC has by now acquired the ability to manufacture 60 percent of its parts here at home. Moreover, the aircraft is assembled completely in Pakistan.

The JF-17 thunder is the 3.5 generation multi-role light combat aircraft. It flies on the Russian RD-93 KILMOV engine. It has state of the art Avionics and a beautiful and well-designed airframe. Its cost is one-third of any modern jet fighter. This has been one of the biggest national projects, and along with adding to PAF's strength, it has saved the precious foreign exchange, it has taken Pakistan's aerospace industry to new heights and has made Pakistan join the elite group of few countries that manufacture aircraft. So far, almost 73 JF-17 thunder have been given to PAF by PAC Kamra. If the export deals for this fighter jet materialize, it would earn foreign exchange, create more employment, and Pakistan will rise in the comity of nations. Aircraft deals take a long time in closing, and for this, the support of the foreign office is needed. The role of political leadership is important in effectively utilizing diplomatic channels for making deals.

Defense Exports can really boost the economy. The export of defense products such as jet fighters and other technology-intensive products leads to the establishment of a long-run relationship with the client country. This adds to the Economics benefits as well as political influence. It is, therefore, of great significance that studies be undertaken to assess Pakistan's Export potential in terms of Defense Products and find out markets for them. The study is an attempt in that direction.

Relationship between Defense Industry and Economic Growth

The literature is not in agreement over the relationship between Defense expenditure and economic growth. However, we are able to identify three strands or categories under which the literature on the subject can be categorized. One, there are studies that advocate a positive robust relationship between economic growth, defense spending, esp. the defense industry. Two, there is a school of thought that advocates a negative relationship and the third group advocates an inconclusive relationship.

Some studies, such as Benoit (1973,1978), propose that there exists a positive relationship between defence expenditures and economic growth. Other studies supporting the argument include Weed (1986) which found that defense expenditure may boost economic growth through human resource development and building export potential, which can lead to import substitution industrialization as well as human resource development. Other notable

studies in this area are Lai et al. (2002), which reported that defense expenditure caused economic growth supporting Benoit (1973,1978). In the post 9/11 United States, it was found that defense expenditure and defence-related investments have led to increasing in growth (Atesoglu, 2004). Other distinguished works that agrees with the hypothesis of a positive relationship between defense spending, defense industry and economic growth include Yildrim et al. (2001), Ando (2009), Pempetzoglu (2009) and Mete-Feridun (2011).

There are some studies that reject the findings of the positive school, and they maintain that there exists a negative relationship between the two. Prominent studies include Deger (1986), Lebovic & Ishaq (1987), Badr and Qarn (2003), Kentor & Kirk (2008, which advocate that there exists a huge tradeoff between the defense spending and the social sector,), studies with special reference to Pakistan have often reported a negative relationship Hou (2009), Khilji (1997), Shahbaz et al. (2013).. found that the Défense expenditure of Pakistan has been anti-poor that is it affects the poor segments the most.

While there exists a third school of thought that believes that the relationship between defence spending and economic growth is inconclusive, some important work in this regard is presented by Biswas and Ram (1986). The study was the first to report that defense expenditure neither hurts nor boosts economic growth. Looney (1995), while running the Hsiao tests for Pakistan, found that Pakistan's defence spending had no effect on its low saving rate augmenting the findings of Biswas and Ram (1986). that there exists no relationship between growth and Defense Spending. Khalifa (2002) further supports the case of inconclusive relationship by examining the phenomenon in six gulf countries. Khan (2004) found them to be unrelated in the case of Pakistan. Therefore, defence expenditure needs to be viewed on a case by case basis.

There can be many reasons to which this disagreement can be attributed. However, the most important ones include the choice of models used, the technique adopted, and the theoretical lens with which the phenomenon is viewed that is viewing it from a supply-side economics perspective; we would always find the relationship to be negative. But if one looks at it from the Keynesian perspective, the relationship will be positive, i.e. defense expenditure boosts economic growth by boosting aggregate demand. The studies have also relied heavily on the use of econometrics. But one has to acknowledge that there is a political economy to defense expenditure and the case of the defense industry. The literature so far has been unable to capture that effect in the models employed to study defence and economic growth nexus.

We believe that defense expenditure in the case of Pakistan can prove to a growth booster since it would increase aggregate demand through an increase in employment which would translate to higher saving and higher investment through the multiplier effect. The foreign exchange, which is another issue in Pakistan economy, will also be resolved if defence exports are made possible. The effects will then spill over to other sectors as it would create a human resource that would be able to contribute to other modern, say industrial sectors in the economy. This angle has been ignored in the literature on defense economics, especially in case of Pakistan. The current study is an attempt to highlight the achievement Pakistan can make if defense industry and defense exports are prioritized. And the JF 17-thunder, Pakistan's multi-role fighter jet is perfect example where positive effects of defense industry on the overall economy can be realized.

Jet Fighter and Other Countries

The US commission on the future of the aerospace industry issued a report on the economic impact of the aerospace industry on the economy. It is worth mentioning here that the commissioner of the report while making the presentation, ended his speech with these words *"A strong aerospace industry is essential to enable the United States to defend itself, compete in the global marketplace, maintain a highly skilled workforce, and provide all Americans with the ability to travel safely and securely anywhere in the world*". He was not very wrong if the statistics which he revealed in the report are studied. The US aerospace

sector employed 2 million workers in 2001 with an average wage of 49000 USD per employee. The report stated that the US aerospace sector had global, national as well as local level economic impact. What this tells us is that the aviation industry has a major role to play in the development of an economy. It creates employment, enhances export potential, brings a number of allied industries into action and brings in new technology, which is a requirement of the industry given its ultra-sophisticated nature and the need for perfection

Export Potential and Import Substitution

In 1986 work on the Euro Fighter (typhoon) began. It is a joint project of three companies, namely Alenia Aermacchi, Airbus Group and BAE Systems. Its development began because of the joint efforts of the UK, Germany, Italy and Spain. Due to political reasons, France had left this consortium and started developing its own "*Rafael*". The first prototype of the Euro-fighter flew in 1994, and its first batch was inducted into the European air forces in 2003. Germany, Austria, Italy, Saudi Arabia, and Oman have inducted the Eurofighter into their Air forces. It is an agile fighter aircraft and has had its combat debut in 2011 Libya airstrikes.

Typhoon has had a huge impact on the Balance of Payment of Europe. It has not only strengthened the European industrial base in aerospace engineering but has also reduced Europe's dependence on the USA. In 2006 alone, the euro fighter had 90 export orders amounting to 9.5 billion euros. Hartley (2007) claims that the typhoon has saved 33.5-54 billion Euros for the European customers, basing the higher estimate on the assumptions that typhoon was the least-cost solution and the lower estimate on the assumption of purchase of USF-15 e and F18E/F aircraft. In total, the Eurofighter has saved roughly 43 – 64 billion Euro over the last 10 years.

To have a complete cost-benefit analyses of the Euro Fighter, its impact on Employment, Technology spin-offs, Balance of Payments need to be analyzed Hartley (2007). The typhoon program has created jobs across Europe in 400 European companies. The number of jobs created by the typhoon, directly and indirectly together amount to around 100,000 to 105,000. The distribution of the jobs in 2006 was such that the UK had 40,000 jobs, Germany and Italy 20,000 each and while Spain had 25,000 of the total jobs created by the typhoon program (Hartley, 2006). Most of the jobs created by the typhoon are highly skilled and highly paid jobs. These can be also be used in the motorcar industry, electronic industry and Airbus 380 work.

Apart from jobs, the Eurofighter (Typhoon) has had a great technology spin-off effect on the Civilian industry. For example, the engine technology, the carbon fibre technology, the flight control system etc. there is spin-off in the form of business practices and even in the racing car industry.

Job Market Stability and Diplomatic Effort: The Case of Rafael.

Dassault Rafael, a French-made Jet, was only used by the French defense forces. Due to its high cost, there were no significant Export prospects, but since it employed a huge number of people and more than 500 suppliers of different components of the jet were connected to it, the French Civil machinery and its political leadership made different diplomatic manoeuvres to sell the jet. Egypt, whose requirement never was the Dassault Rafael bought it. The financing for the deal was also provided by the French government in order to keep people on jobs; the French government gave Egypt a loan so that the jet gets sold. The President of France made trips to Qatar for closing the deal on the jet and other defense systems. And French defense minister paid visits to India for making the deal. The negotiations are still on the way. These efforts by the French political leadership are testimony to the fact that defense industry and aerospace industry play a vital role in developing the economy, creating employment, and earning Foreign Exchange. The fact that the French President so successfully closed deals with Qatar and Egypt earned him the title of Europe's number 1 salesman. And he did it because jobs in France depended on it.

The JF-17 Thunder

As discussed above, if the deals for Jf-17 thunder materialize, it can fetch us the much needed foreign reserves and can help balance our current account deficit. A lot of questions might be asked when discussing export prospects for the Pakistani JF-17. These might include questions such as 1) Is JF-17 really of export quality? 2) Does it possess the characteristics of a good fighter jet? 3) Will it really boost the foreign exchange reserves and fetch our return as the Eurofighter or Rafael has done for Europe and France, respectively? How exactly will the JF-17 be sold? And what are the markets for it?

The study addresses these questions one by one and aims at proving that the JF-17 thunder is a very viable export option, and the political leadership should play its role in realizing this task so that the country's economy can be boosted and help Pakistan deal with problems on many fronts.

Methodology

The study was unique in the sense that no previous work on the potential of JF-17 as an export option was available. Firsthand information was needed to assess the viability of the JET fighter. Therefore, in-depth interviews were conducted with senior officials of the Pakistan aeronautical complex (PAC) and the Pakistan Air Force (PAF). The interviews could not be recorded; therefore, they were documented instantly, and in case of confusions, the respondents were contacted again to get our transcriptions verified. The interviews were open-ended, and the major themes included the export potential of the Pakistani Aviation Products, the hurdles faced by Pakistan Defense exports, the quality of the products and the international markets available for the products of Pac Kamra. Senior officials of the PAF and PAC constituted the sample. Our respondents were involved with the JF-17 b program and were overseeing its various aspects. We transcribed the interviews, and based on the information given to us by the people directly linked to the JF 17 program; we are reporting our findings through this research study. In this study, we have used both primary and secondary data. The primary source is the interviews with the respondents. We have used those interviews as support for our argument. The secondary sources include various international reports and news pieces, which present numerical as well as qualitative evidence for the arguments presented in this expository essay.

Is the JF-17 Really of Export Quality?

Every product has certain attributes. Its performance and quality are judged against those attributes. The attributes on which a jet fighter is judged include things such as the airframe, the avionics and the weapon systems it can employ. The JF-17 thunder has a beautiful airframe. It has state of the art avionics, and any weapons system can be mounted on the jet, and PAC has the entire resources available for them. So as far as the attributes are concerned, the JF-17 thunder has all the attributes of a good fighter jet.

Moreover, the Pakistan air force is one the best air force in the world and its performance is globally recognized. PAF has to be battle-ready at all times due to the hostile neighbors and unfavourable global scenario. PAF cannot risk employing a low standard jet. If PAF has inducted the JF-17 into its fleet, it's evidenced enough of the quality of JF-17 thunder.

The buyers of jet fighters also look at whether they would be able to modify the aircraft as per their requirement or not since PAC has complete resources available, so any sort of modifications required by the buyer can be done, which really makes it a very good choice for air forces in much of the developing world.

The fact that JF-17 thunder has been a performer in all of the world major air shows, the aircraft was showcased at the Paris, Zhuhai and Dubai air shows is the testimony of its quality and export potential.

The mistake is often made when JF-17 thunder is compared with aircrafts such as the USAF's F-18 or the Mirage 2000 of France. The JF-17 is designed for specific purposes and special sort of missions. Its main job is to deter threats and intercept enemy aircraft as well as bombing and annihilating targets when needed. The buyer of JF-17 will not be buying

it for extending any hegemonic agendas rather for the security of air space. Pakistan does not have any hegemonic designs, and so the JF17 thunder suits our purpose best. Since most developing countries have this aim, we need not compare the JF-17 with the higher generation aircraft of today.

Will the JF-17 Thunder Really Boost our Economy as the Eurofighter has Boosted the European Economy?

Exports always boost economic growth. It doesn't matter what the commodity is. Jet fighters are going to be in demand around the world in the coming years. Air power plays a decisive role in modern-day warfare. Selling just one jet can fetch us more revenue than selling tons of wheat or a bulk of small appliances. The aircraft is completely manufactured in Pakistan. The aircraft has added to PAF's strength and self-reliance and has also saved billions of foreign exchange. JF-17 thunder has saved billions of dollars because if we had to buy the same number of F-16s or Rafael or Mirage 2000, it would have been a very costly business. The JF-17 thunder is another way having a positive impact on the economy, i.e. it is creating employment, providing foundations for Pakistan's aviation and avionics industry and most importantly, it has made Pakistan rise in the comity of nations by making Pakistan join the elite group of few countries which are jet fighter manufacturers.

JF-17 thunder sale's price would lie between 30-35 million US$ (interview with high ranking PAC official). It is the lowest cost jet fighter available in the world. The foreign exchange fetched by it can be huge. Also, the country buys a single jet rather it is bought in large numbers. If we are able to secure deals with three to four countries, this could make the JF-17 thunder a very important source of boosting foreign exchange reserves. Secondly, when an aircraft is sold, it's not just an end game. In the aerospace and defense industry export, the relationship between the buyer and the seller is never limited to the sale of the product only; rather, it extends to a lot of other avenues as well. For instance, in the case of the sale of a Jet Fighter, the buyer will also have to buy in "Training" both flying and technical, Simulator, etc. She will also depend on the Original Equipment Manufacturer (OEM) for the repair and Maintenance, Transfer of Technology (TOT), and spares. So that relationship will enhance further diplomatic ties, trade of other non-defence related products as well, and it will also add to the political strength and influence of the exporting nation. Moreover, a Fighter Jet, once sold internationally, attracts further buyers with its successful operation.

How Exactly will the JF-17 be Sold? And What are the Markets for it?

Like all country to country trade deals, there is a political aspect of the defense deals as well. The entire government machinery has to work for it in order to secure a sale for the JF-17 thunder and other defense products of Pakistan. It is the task of the ministry of foreign affairs, the Ministry of Defense (MoD), the Ministry of Defense Production (MoDP), the Defense Export Promotion Bureau, as well as government special services departments to work in coordination in this direction so that sales can be secured. The foreign office has to play its part by identifying key areas where we can sell our goods. It is the job of the foreign office to report to the MOD and MODP about the prospects of defense markets. Securing the export market for Pakistani defense goods should be the top priority of the Foreign office. The Prime Minister should pay a personal visit to the countries that are potential market and the efforts should be made at senior most level that is "the head of the state level". The MODP should be able to ensure that the client is supplied with the number Fighter Jets with the possible custom modifications.

The markets for JF-17 are African republics, Sri Lanka, and even conflict ridden zones in the Middle East, for example Iraq.

Nigeria

Nigeria has one of the largest air force in Africa. Nigerian air force's combat campaigns are spearheaded by the f-7s while the French-German Alpha jet is in a support role. The recent Boko Haram crisis has made the

Nigerian air force more and more important in the Nigerian Defense. Boko Haram is a guerilla movement, and therefore, Nigeria needs a well-equipped air force in its operations to annihilate the logistic bases of the Militants. Furthermore, the Nigerian air force has recently embarked on the modernization campaign by acquiring F-7s in 2009, the production of which was stopped by the CAC (Chengdu Aircraft Corporation) in 2013; its licensed manufacturer. Nigeria became our customer in 2016, by ordering 10 super mashaks out of which 4 have been delivered by PAC. Pakistan has also given technical support informed of pilots, engineers, and technicians, thus ensuring a long time relationship with Nigeria. The praise that the super mashaks have received from the Nigerian chief of staff is testimony to the fact that Nigeria has a taste for Pakistani defense goods. The Nigerian air force, in reference to its area of operations and the number and types of the threat it faces, is in dire need of an aircraft such as the JF-17 thunder. The JF-17 thunder can serve as a mega up-gradation of the Chengdu –F7, which is the prime combat aircraft used by the NAF. Given budget constraints and the threats posed by Boko Haram, the JF-17 thunder is the best option for Nigeria.

Sri Lanka

Sri Lanka has good government to government ties with Pakistan. Pakistani armed forces have helped the Sri-Lankans in defeating the (Liberation Tigers of Tamil Eelam) LTTE, commonly known as the "Tamil Tigers". The Sri Lankan Air Force (SLAF) has mainly specialized in providing support to ground troops but also has the capability of ensuring air defense. F-7 was the first Chinese built aircraft that was inducted by SLAF in 1991. SLAF has also inducted the K-8, which is a co-production of Pakistan and China and is Pakistan's premier Jet trainer. PAC and SLAF have a long history of business. PAC provided the SLAF with repair and overhaul services. Sri Lankan Air force (SLAF) approached PAC for the maintenance and overhauling of F-7, F-t7 and F-t5 aircraft. PAC agreed, and a team brought those aircrafttoAircraft rebuild factory (ARF) at PAC. The Pakistani team disassembled the aircraft, flew it to Pakistan. ARF also offered to train the SLAF technicians and engineers during the overhaul process. The SLAF team learnt the overhauling technicalities and working on different weapons systems. All these aircraft were overhauled and repaired by the ARF. These aircraft were again disassembled and flown back to Sri Lanka. The ARF technicians reassembled the aircraft and flew it for a test flight, and afterwards handed it back to the SLAF. This project initiated in 2002 and was completed in 2004. A total of six aircraft were overhauled and repaired for SLAF.

Given such successful business and political ties between the two countries, Sri-lanka again can prove to be a very good customer for the Jf-17 thunder. Moreover, the main attack aircraft of SLAF is the F-7. As mentioned above, JF-17 is a mega up-gradation of the F7. Since F7's production has stopped since 2013 so Air forces like NAF and SLA, which inducted F-7 as their primary attack jet, will see it financially and technically viable and feasible to induct JF-17 thunder in their fleets in order for their fleets to be battle-ready.

Iraq

Post Saddam, Iraq has been devastated by American aggression and internal civil war. The armed forces of Iraq had been annihilated by the Allies. Iraq has since then tried to recover, but the growing internal war in the form of ISIS and the Syrian conflict has not let the Iraqis breathe a sigh of relief. Among other things, the Iraqi air force (IQAF) has also been uprooted. The country has tried to revive it somehow but in vain. IQAF, which was at a time the largest air force in the region, has now been totally trashed. All rebuilding efforts are being made with the help of the US. The IQAF is very resource-constrained at the time and needs major rebuilding, now for sure. It does not have the resources to purchase F22's nor does it need a fighter like the F22 given its terrain and policy objectives, The JF-17 thunder can best fit the needs of IQAF and its resources. Given the right incentives, IQAF will be willing to purchase the JF-17 thunder.

Why Should these Countries Buy from Pakistan?

With many purchase options available, why should these countries buy from Pakistan? There are many reasons for this. The most significant of them is that JF-17 is affordable Airpower. It can prove to a deadly weapon at a very low cost. The use of JF-17 by the Pakistani air force in its different operations has proved the lethality of the fighter jet. In this price and specs, no other fighter jet around the world can match the JF-17. Its price is one-third of any modern jet fighter. So if suppose one can have three fighter jets at the price of one , why would not a third world country go for it.

The JF-17 thunder has the ability to take any weapons both nuclear and conventional. It has a maximum speed of 1,910 km/h (1.6mach). Its multi-role nature makes it the best choice at an affordable price. The thrust after burner of the JF-17 is 84.4 KN while its dry thrust is 49.4 Kilo Newton. The ferry range of JF-17 thunder is 2037 kilometres, which means that on its single tanks, it can take off and be airborne for more than 2000 kilometres and then land(JF-17.com 2017). This means that the JF-17 can play the role of a reconnaissance aircraft, an interceptor as well as an attack aircraft. Countries like Nigeria, Iraq and Sri Lanka don't have the capacity to have an F16 or mirage 2000 airborne for such a price. The JF-17 is the most viable solution to the defense requirements of these countries. Moreover, now that Pakistan can fully modify the jet fighter in accordance with the needs of the buyer. PAC can integrate any sort of weapons systems in the JF-17 thunder. The jf-17 thunder has 7 hardpoints while the mirage has 9. These factors will make the JF-17 the buyers' choice.

Delivery is another thing that matters. PAC can quickly deliver the order and can transport it without any delay, the reason being that we have the complete ability to manufacture the fighter jet. Secondly, with orders coming from abroad we can expand our production base thus leading to high production so that we can match orders. Moreover, PAC's competence can be well understood from the fact that it has acquired international contracts and has successfully completed them, leading to long term relationship with the clients. Boeing is one such example.

In the year 2001, Pakistan international Airlines entered a contract with Boeing. PIA was to be given 11 Boeing aircraft. One of the clauses of the contract made it mandatory for Boeing to invest in Pakistan. The government of Pakistan at that time identified PAC (Kamra) and Precision engineering complex (PEC) as the two most feasible options. Boeing made a visit to PAC Kamra for an assessing the quality of the facilities of PAC. Boeing supplied the required training and Equipment to PAC, and by 2007, PAC Kamra was producing parts for Boeing. PAC Kamra was also given Quality management certification by Boeing. The heat and surface treatment facilities required by the activity were improved, and for that, PAC Kamra also got NADCAP certification. By 2011 over 1400 Boeing parts were manufactured in PAC Kamra. This venture played a significant role in preparing PAC for the co-production of JF-17 thunder.

What Benefits are there for Pakistan?

Trade has always been beneficial for countries. Trade has a direct positive impact on foreign exchange reserves. Now, whether a country trades in potatoes, gold or weapons, the effects are more or less the same. The major benefit to Pakistan will be the foreign exchange earned through the sale of the fighter jet. According to the interviews, the cost of producing a JF-17 thunder is between 30-35 million US$ while the cost of F-16 is about 80million US$ and that of Dassault Rafael is 100 million US$. Pakistan had to buy a multi-role aircraft to modernize its fleet and to keep a minimum deterrence policy towards the adversary. Since due to sanctions, Pakistan could not acquire F-16, and the cost of Rafael was quite high, given our strategic environment and economic situation, JF-17 was the best option available. So far, almost 50 JF-17 thunder have been given to PAF by PAC Kamra. If the same number of Rafael were to be given to PAF, the cost would have been 50 Hundred million and if the same number of F-16 were to be bought, the cost would have been 40 hundred million US$. Instead JF-17 thunder saved Pakistan about 30 million per piece. If

the export deals for this fighter jet materialize it would earn foreign exchange, create more employment and Pakistan will rise in the comity of nations.

The sale of the jet, as mentioned above ensures a lifelong relationship between the seller and the buyer. The buyer depends on the seller for maintenance support, spares, technical guidance and expertise and this goes on till the life cycle of a product is complete and till the jet is in service. Securing a sale for JF 17 will make Pakistan able to enter a long term relationship with the clients, which will have political and economic benefits as well for Pakistan.

On the economic side, it boosts jobs in the OEM's country. Since the jet fighter becomes a part of a fleet of another country so, more maintenance, spare support and technical help are required by the Operators(buyers), which in turn leads to an increase in the scale of manufacturing and thus in the OEM's country, jobs are boosted. Secondly spillover effects are there, people who retire from the aerospace industry can find good use of their skills in automotive and electronic industry. Thirdly the direct and indirect employment generated by the aerospace industry boosts local demand thus having a positive impact on the economy.

On the political side, if a country becomes dependent on you for spares, guidance, maintenance and technical help, leads to a strategic relationship. If a country is dependent on OEM for all the complementary needs, it will imply that there is little chance that our client would not respect our interests. Moreover, it gives political leverage to the seller, and the seller is able to dictate terms and make further mutually beneficial deals. More or less, this is how the United States plays its game internationally. Among other things defence is one of the major leverages used by US, Europe, Russia and China in international politics. Defense export can make Pakistan enjoy the same status.

Conclusion

Pakistan defense industry has immense potential to help Pakistan manage its BOP crisis by earning the much needed foreign exchange. The prospects for defense exports should be well exploited by the foreign office and the political leadership of Pakistan. Pakistani defense products ensure reliability and quality at a very low cost. Secondly, Pakistan can acquire economies of scale if Pakistani defense exports find their way to major markets; the JF-17 thunder is an ample example. It has the strength, agility and control that characterize modern-day multi-role fighter jets. Moreover, its low price and indigenous production capacity in Pakistan make it a very feasible option for certain countries such as Nigeria and Sri -Lanka. Exports of the JF-17 thunder will fetch Pakistan economic as well as political benefits, but for the actualization of these hopes, the Pakistani political leadership should play its due role. For instance, the French premiere FrancisHollande earned himself the title of Europe's best salesman. The title reflected Hollande's effort to secure sales for Dassault Rafael. France made deals with Qatar, Egypt and India. Pakistan's political leadership should pull up its socks and do the same for JF 17 and other defense products of Pakistan; if they are able to do so, this would lead to prosperity by bringing in political and economic strength and may solve much of the country's development problems.

Policy Recommendations

Pakistan Aeronautical Complex provides services to one of the best air forces in the world, the PAF. It is headed by an air marshal. The position of chairman is one of the most important positions. There should be a platform on which the ex-chairman Kamra could come together and brainstorm on various issues such as the export of JF-17 and other Aerospace products of PAC. A similar sort of forum should be there for the retired air chiefs. So far, there is no way in which the current leadership can learn and benefit from the experience and skill of the retired chiefs/

Another problem that exists in the Armed forces, as well as its industrial units, is that no research has been sponsored or undertaken by them. There are no trained researchers in marketing, economics and finance with them. Had there been such a team available with the PAC it could ensure the sale of its products and

capture international market. Therefore it is recommended that the PAC induct researchers who specialists in their field and who can work on the marketing and finance aspect of the JF-17 thunder.

The political leadership should gear up and make plans for securing markets for Pakistani exports. The foreign office and the civil machinery should play their role. And there should be perfect coordination between all units as such to ensure that the JF-17 and other defence products of Pakistan may be sold.

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