



Factors affecting military expenditures in the Asia-pacific: Evidence from a panel-data, Quantile regression, and FMOLS

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A B S T R A C T

The current study investigates factors affecting military expenditures within the Asian-Pacific context. By doing so, a period ranging from 2005 to 2021 was selected with ten diverse countries from the region. Several statistical analyses consisting of an OLS, fixed & Random effect was performed. Whereas a quantile regression was also included to capture the omitted effects of the panel data. Likewise, an FMOLS was used to better evaluate the long-run effect and the relationships among the factors. According to the findings, financial development (FND), Trade (TR) and Technological innovation have positive effect on defense expenditures, the following effect was backed by the FMOLS estimates which demonstrated a similar finding making the results more robust. On the other hand, economic growth (GDP) and bureaucratic effectiveness (BR) displayed a negative sign in the rise of military expenditures. At the same time, FDI inflow manifested a positive significant effect, but, only in the OLS model and through the upper percentiles. Overall, the research is the first to encompass several macroeconomic factors with other external variables to assess Asia-pacific security expenditures. And indeed, with the current global conflicts, it is hoped this research will provide a decent information about the ineffectiveness and effectiveness threshold of increasing defense expenditures.

INTRODUCTION

The year 2021 saw a rise in global military spending, the estimated accounted for 2.1 trillion USD according to a report published by SIPRI. Although this worldwide increase in defense expenditures was not noticed in the U.S. The United States declined marginally to 3.5% compared to 2020 which amounted to 3.7% of GDP. Nevertheless, this decrease only applies to arms procurement funding. Whereas, the country had witnessed an increase in military-related research development. Indeed, the rise in R&D expenditures indicates that the US is putting more of an emphasis on next-generation technology.

On the other side of the world, China, the second largest contributor had increased its defense expenditures by 4.7% in accordance with its five-year plan, which consists of consecutive rising in military expenditures until 2025. Their neighborhood, the Japanese government in its first budgetary approval for 2021 increased by 7.3% its military expenditures making the country transform a sum of 54 billion USD into the defense sector. Similarly, Australian military expenditures rose in 2021 by 4%. According to a senior researcher in SIPRI, military spending in nations like Australia and Japan which were priority insatiable for rising military expenditures has increased significantly as a result of China's increasing aggressiveness in the South and East China Seas.

Certainly, rising expenditures for the sake of security preservation might be the ultimate goal for these countries, and this has been reinforced by the Russian invasion of Ukraine. Nonetheless, this appears inconsistent, and irrational, especially when perceiving military expenditures as an economic driver when in reality, is a mere future security investment. Pragmatically speaking, government spending on national infrastructure and human capital, as well as small business enterprise investment, is more effective in fostering

economic expansion than allocating exorbitant sums to the military sector. Hence, this spending may therefore discourage growth to the degree that they crowd out investment spending (Hewitt, 1992). Although, this can be counter-argued with the productivity of arm exporting, as such exportation generates revenues for the government. However, the potential for positive economic spinoffs from the military in advanced nations when a sizable amount of their military equipment is exported is fairly constrained, and ultimately depends on the importer's extent of security challenges.

Although, allocating a decent budget to the defense industries provides the state to enjoy several guarantees, which involves security and prosperity in a peace contextualization, although it would be quite irrational to consider expenditures in the defense as revenues for such profits generated mechanism can be restricted if somehow impossible for non-exporter armament states. Nonetheless, an increase in military expenditures is inevitable, knowing completely the effect of civil war on states' potential sectors. Hartmann et al. (2007) contend that financial development is built on functional banking markets, ongoing financial improvement, optimization in institutional and policy quality, growing market competition with lower transaction costs, and the use of both human and physical resources. Likewise, (Hasan & Murshed, 2017) noted how financial sector implication, resource damage, disruptions in consumption behavior, risky financial circumstances, and humanitarian catastrophes are all consequences of war. In this light, one may anticipate that armed conflict will inevitably have an impact on financial profitability and performance since it is directly tied to the production of human capital and is at the very least, indirectly related to political, and institutional frameworks, hence, infusing a collective impact, particularly with constrained military expenditures.

Addison et al. (2002) adopted a framework in which they concluded that the efficiency of fiscal and monetary programs may decline during a conflict, and financial circumstances may deteriorate. The value of the domestic currency may decline due to fears of rising inflation, which would lead to a decline in demand relative to other assets. Indeed, monetary substitution is a regular occurrence in such situations, which reduces the financial strength of the economy. Chowdhury, and Murshed (2002), further provide empirical support to the following theory, in a cross-country scenario, the author looked into how armed conflict impacts financial growth. Their empirical research shows that wars reduce financial size. They also demonstrated, compared to low-level conflict, medium and high degrees of armed conflict considerably have more detrimental consequences on financial growth. To determine how conflict is related to financial growth, they employed a cross-section ordinary least squares technique.

Moving from financial development to a more generalized scope that involves macroeconomic factors and economic growth. Cappelen et al. (1984) examined data from 17 OECD nations between 1960 and 1980. For three reasonably homogenous subgroups of nations, their analysis was based on a straightforward mathematical model based on economic theory. In general, it was discovered that military spending had a detrimental impact on investment. These two impacts have a polar opposite influence on economic expansion. The general result is that, with the exception of the Mediterranean regions, military spending has a negative impact on economic development across the panel for the entire sample of nations including the subgroups.

In their article, (Kollias et al., 2004) also used a co-integration and causality tests to evaluate the link between defense expenditure and productivity across the EU15 members during the years 1961 to 2000. Their findings showed that the direction of causation from growth to military expenditures appeared to be prevalent. In addition, Yildirim et al. (2005) empirically investigated the links between defense budget and economic development in Turkey and Middle Eastern nations between 1989 and 1999. Cross-sectional and panel data estimate approaches were used to examine the link between defense expenditure and economic development. The empirical findings demonstrate that military spending contributes to economic growth only in Middle Eastern nations. Using panel data from 90 countries covering the years 1992 to 2006, (Pan et al., 2015) employed the GMM approach. According to their findings, military spending hinders macroeconomic stability in low-income nations. nonetheless, four separate geographical panels, including Europe, the Middle East, and South Asia showed a low but more negative causal link between military spending and economic development. Other prominent studies also concluded the overlapping relationship between economic growth and military expenditures see (Pradhan et al., 2013; Chang et al., 2014).

According to a number of studies (Deger and Smith, 1983; Dunne et al., 2005), military spending discourages investment in economically productive industries, which lowers economic development. External factors that encompass foreign direct investment, have been studied by also by (Gartzke et al., 2001; Li & Vashchilko, 2010). These authors contend that investment decisions made by FDI investors are based on the premise that the host nation would provide robust security backed by adequate military spending. In fact, even if the developing world is today quite receptive to Western multinational investors, the country

risk, which has a multifaceted nature in terms of its source and range (micro or macro), continues to play a key role in investors attraction, alongside other potential country's assessment. Additionally, Pacific et al. (2017) examined the effects of military spending, shipments of products and services, and FDI on the economic boom of Cameroon from 1996 to 2014. The findings showed that although FDI is not statistically significant but has a beneficial influence on economic growth, military spending and exports are statistically significant and have a favorable link with economic growth. Likewise, Aziz and Khalid (2019) showed that military spending lowers FDI inflow in the context of violent conflict. However, when there is an armed war, the negative effect is lessened by higher military spending. The author also demonstrated that the impact of military spending on foreign direct investment is time-sensitive since it requires a while for military spending to influence FDI inflow.

Likewise, the relationship between international trade and the defense industry has been underlined by (Papanikos, 2015). The author analyzed the effect of military spending on trade and gross domestic in the Mediterranean and Europeans union, mostly for their relatively diverse trade agreements. Their research revealed significant differences in military spending across the 20 Mediterranean nations. they also showed a distinction between the eurozone areas and the union European countries. Additionally, the test indicated that the causation is most likely from trade to defense spending, which is supported by the straightforward descriptive findings of the existence of a negative relationship between rising international trade and military spending.

In a similar vein, Compton and Paterson (2016) take into account the potential influence of institutions on military spending-growth relationship. based on yearly data from 100 nations between 1988 and 2010 using (OLS) and (GMM). According to the finding, the influence of military spending on economic growth is negative and negligible, although this can be minimized in an environment with strong political and economic institutions. Using an African sample between 2003 and 2007, d'Agostino et al. (2012) looked deeper into the development of military spending in the face of corruption. They discovered that corruption does have an impact on how military spending affects economic growth.

In a relevant paper, regarding the relationship between institutional quality and military spending, Gupta et al. (2001) has argued that the expenditure designated for the defense department to carry out various military-related projects may be needlessly increased in nations with poor institutional quality, which is exhibited in the form of a high level of corruption. Keeping in line with institutional qualities, Solarin (2018) employed on 82 nations in a panel ARDL approach and discovered that military spending is greater in nations with poor institutional quality, indicating that certain states may be less likely to increase military spending to force and terminate hostilities. In other words, state expenditure, particularly military spending, is not always accessible and transparent. In such a scenario, military funding may be misused for personal benefit or may result in "corruption expenditures".

In order to substantiate the claim that militarism is often wasteful in nations with weak institutions, Oyerinde & Fagboro (2020) employed corruption as a stand-in for institutional quality. They found that corruption raises the desired level of defense expenditures and that economic development is often negatively impacted when examining the interplay of

institutional effectiveness with military expenditure on economic growth. In more precise words, the interaction term is unfavorable, suggesting that when corruption or poor institutional quality is present, spending on the military slows economic development. On the other hand, Raifu, Obijole, & Nnadozie (2022) Explored the association between institutional qualities proxied by corruption and military spending and unemployment. The author demonstrated that the connection between military expenditure and unemployment is not moderated by institutional quality in any substantial way.

Furthermore, economic historians account for the association between technological innovation and war. Gummert (1991) noted, since the 1950s, the contribution of industry to British defense-related Innovation has increased significantly. Compared to France, Britain's security R&D accounts for a lesser portion of its defense-related performance throughout time. British universities also contributed to a higher output share of defense mixed with R&D over the 1989–2003 period than French universities. The author has also noted that military Innovation and acquisition are seldom activities that can be classified or studied as being based on the market. For instance, there is insufficient competition between companies, including the fact of trading with single customers, therefore establishing a market directed by a monopoly whose price, entry, and exist are directed by a single authority.

Nevertheless, a two-way effect can be noted from defense expenditures and technological innovation. The first mechanism is based on the funding of specific bodies and engineering that contribute to the innovation-related defense industries. These subsidies may also help institutions that do experiments and teach researchers and engineers, which are crucial institutional parts of national innovation systems. As a result, leading to a civilian spinoffs defense related innovation that supports both civilian application and the defense sector. In other words, these two overlapping demands for workers and providing funding could reduce market unemployment, while simultaneously benefiting from advanced technologies without venturing to acquire from foreign countries. In a similar attempt, Trebat and Medeiros (2014) contended that China's technological capacity has improved as a result of the attempts to upgrade the manufacturing of weapons by integrating civilian and military sectors into the economy.

Yet not all defense expenditure is blatantly ineffective or even destructive from an economic standpoint. For instance, it is sometimes claimed that spending on military activities in growing nations may operate to raise the standard of education and discipline among the labor force while assisting in reducing unemployment (Knight et al., 1999). Likewise, the improvement of property rights enforcement brought, generally, by military spending also promotes private sector development. Military spending on capital projects may also be put to good use; for instance, many developing nations will gain from the transportation and communication systems that were first built for military reasons.

These examples demonstrate that the issue of whether and how much military expenditure is economically wasteful or beneficial cannot be answered by relying on circumstantial evidence and narrative generalizations, but rather calls for careful conceptual and empirical investigation (Knight et al., 1999). In this paper, we address the following issue from an alternative dimension, rather than solely focusing on macroeconomic factors. Therefore, we incorporate in our study other potential variables

to expand the theoretical application of the research. By doing so, FDI spillover, bureaucratic effectiveness, Technological innovation, trade, and financial development were selected alongside economic growth and research development. The contribution of this paper falls in several different streams; certainly, previous authors (Yildirim et al., 2005; Aziz & Khalid, 2019; Cappelen et al., 1984;) investigated the role of military expenditures in economic growth, whereby (Compton and Paterson 2016; Solarin 2018) studied the role of institutional quality nexus military expenditures, nonetheless, this paper takes into account the reverse causality, an effect directed from the economy and other potentially selected variables to the defense industry. Similarly, Previous authors have to some extent neglected the role of technological innovation and financial development on military expenditures.

Furthermore, to our knowledge, it is the first paper that merges a tripartite econometric model consisting of an OLS, Fixed, and a random effect to capture the impact of the aforementioned variables, although potential papers (Kumar, 2017; Nadeem et al., 2020; Odehnl & Neubauer, 2020; Awaworyi & Yew, 2018) underlined the role of military expenditures in different governmental sectors across continental levels, nevertheless, none of these papers taken into consideration a tripartite econometric model. Moreover, to provide additional novelty, a quantile regression analysis was included, in order to catch the effect that couldn't transpire during the panel data evaluation (Hendrickson et al., 2018) presuming different percentiles could provide certain partially omitted causality of the explanatory variables on military expenditures. Finally, after exploring the effect between the regressors we aim to shed the light on the relationship between the factors, by employing a Fully Modified Ordinary Least Squares (FMOLS) model. Aside from performing several statistical models, the study has other implications, particularly considering the fact that this study is one of the first studies to focus on the Asia-Pacific countries, a threshold of regions, that hasn't been studied before (Zhong et al., 2017; Wang et al., 2021; Gozgor et al., 2017; Saba & Ngepah 2020).

The paper is structured as follows. In the next section, we present the methodology of the study alongside the econometric equations adopted for the study. After presenting the estimation, we analyze the result while simultaneously providing discussion. Finally, we offer our concluding remarks and future research direction.

METHOD

Data used in this study are from the world bank development indicators, the main dependent variable is the military expenditures of each of the selected countries, respectively. Domestic credit by the financial sector was taken as a proxy for financial development, and many authors have done the same, therefore, inspired by the work of (Gokmenoglu et al., 2021), we proceeded with the following reasoning. Foreign direct inflows (Current), trade (GDP%), and the annual percentage of the GDP growth were all collected from the world bank development. Research and development expenditures were also included in the list of independent variables, whereas government effectiveness was used as a proxy for the level of bureaucratic effectiveness considering the proximate assessment of the variable with public authority efficiency. Similarly, Total patent applications variable was used as a substitute for technological innovation, (Rafique et al., 2020). The last aforementioned

indicators were selected from “environment social and governance data” see Table 1.

Table 1. Descriptive statistics and Variable Summary

Indicators	variable	Mean	Median	Max	Min	S. D	skewness	kurtosis	Sources
Military expenditures	INME	0.24	0.24	0.63	-0.24	0.22	-0.16	2.01	WDI
Financial Development	INFND	1.64	1.94	2.28	0	0.71	-0.50	2.17	WDI
Foreign direct inflows (Current)	INFDIGDP	0.15	0.13	1.47	-2.10	0.58	-0.39	2.22	WDI
Trade (% of GDP)	INTR	0.78	0.45	4.37	0	0.96	1.11	3.31	WDI
GDP growth (annual %)	INGDPG	0.52	0.57	1.16	-1.62	0.37	-0.80	2.37	WDI
Bureaucratic effectiveness	BE	0.69	0.88	2.42	-1.06	1.05	-0.10	1.57	ESG
Technological innovations	INTEV	3.29	3.26	6.14	0	1.76	-0.38	2.39	ESG
Research and development expenditures	RSD	1.25	0.77	4.81	0	1.34	0.72	2.33	ESG

*WDI: World development indicators
*ESG: Environment Social and Governance

Moreover, the current study divides the empirical investigation into three sections, in which every category has its own econometric representation. First, a tripartite model consisting of an OLS, fixed effect, and Random effect model will be performed on the selected variables to examine the determinant and the effect of the bureaucratic system, FDI

$$INME_{it1} = \alpha_{it} + INFND_{it2} + INFDI_{it3} + INTR_{it4} + INGDP_{it5} + BE_{it6} + INTEV_{it7} + RSD_{it8} + u_{it}$$

$$INME_{it1} = \alpha_{it} + \beta INFND_{it2} + \beta INFDI_{it3} + \beta INTR_{it4} + \beta INGDP_{it5} + \beta BE_{it6} + \beta INTEV_{it7} + \beta RSD_{it8} + u_{it} + \epsilon_{it}$$

β are parameters, i observation of all the explanatory variables while ϵ is the error component of the equation, whereas ϵ_{it} is the random effect. Presuming, we validated the model of fitness and the dataset consistency, therefore, we proceed with a quantile regression analysis.

$$\underset{\alpha}{\operatorname{argmin}} \sum_{i=1}^K \sum_{t=2}^N \sum_{i=3}^T \omega_K \rho_{tk} \{Y_{i,t} - \alpha(\tau)^{X_{i,t}} - \beta_i\} + \mu \sum_{i=1}^n |\beta_i| \quad i = 1, \dots, N, t = 1, \dots, T$$

Where i denotes for the countries (N), t the number of observed per country, K denotes quantile index, X are explanatory variables (Matrix), whereas ρ_{tk} is the quantile loss function. ω_K denotes for relative weight on the K -th quantile see. The turning point can be seen from μ . Finally, to proceed with a quantile regression, we consider using the following equation:

$$\varphi_{\gamma i,t}(T|X_{i,t}) = \alpha_{1,t} INME_{i,t} + \alpha_{2,t} INFND_{i,t} + \alpha_{3,t} INFDI_{i,t} + \alpha_{4,t} INTR_{i,t} + \alpha_{5,t} INGDP_{i,t} + \alpha_{6,t} BE_{i,t} + \alpha_{7,t} INTEV_{i,t} + \alpha_{8,t} RSD_{i,t} + \beta_i$$

inflows, GDP growth, and technological innovation on defense expenditures in The Asia-pacific states. Furthermore, to provide robust results while simultaneously exploring the relationship of the variables we will employ an FMOLS model. Accordingly, the study proposes the following equation.

RESULTS AND DISCUSSION

Based on the tripartite empirical results of the panel data, it appears the development of the financial sector has a positive effect on defense expenditures. Both the OLS, fixed effect, and random effect project a long-standing significant effect on our dependent variables, with each of them, contributing to the military budgetary expenditures by 0.0688%, 0.404%, and 407%, respectively. The following positive impact is also supported by the quantile regression, where the financial sector rises military expenditures at percentile Q10, Q20, Q60, Q70, Q 80, and Q90. Although, this impact encapsulates a single effect directed by one indicator, ignoring capturing the real relationship, however, this may be overcome with an FMLOS model. Accordingly, a long-run association has materialized between financial devolvement and defense expenditures.

This implies that financial development boosts military spending in different ways. The first is that; an advanced financial sector provides higher revenues for government to fund its internalities budgetary sectorial, which in turn, raises military appropriations. Second, a developed well-sustained financial structure attracts outside potential entities, subsequently, providing the state with certain benefits from foreign business due to the ease of financial openness and the favorable credit market at the host state, hence, the country can impose suitable taxation, in which, retrospectively, increases states expenditures, as a result accommodating the monetary demand of the defense industries.

Although such as case, relatively, transpires in developed nations, compared to their developing counterparts, who are mostly preoccupied with other macroeconomic and political issues, thus further impeding the incentives of deploying financial sectors toward defense industries, unless, shifting to credit browning fits reasonable, nonetheless, this would lead to an increase in an insufferable debt pouring to an already existential liability. The findings of this study are consistent with the study carried out by (Shaaba & Ngepah, 2019; d'Agostino et al., 2012)

Table 2. Dependent variable Military expenditures

	OLS	FE	RE	FMOLS
INFND	0.0638* (2.49)	0.0404*** (3.44)	0.0407*** (3.54)	0.0417*** (3.17)
INFDI	0.0788* (2.17)	0.0126 (0.74)	0.0127 (0.77)	0.0175 (0.90)
INTR	0.0999*** (4.16)	0.0909* (2.43)	0.0924** (2.65)	0.1195** (2.79)
INGDP	-0.0194 (-0.43)	-0.0416* (-2.18)	-0.0419* (-2.23)	-0.0486* (-2.33)
BE	-0.0896*** (-4.35)	-0.0408 (-1.24)	-0.0440 (-1.43)	-0.0111 (-0.29496)
INTEV	0.00389 (0.27)	0.0316*** (4.08)	0.0313*** (4.14)	0.0294*** (3.47)
RSD	0.0177 (0.90)	0.00273 (0.28)	0.00261 (0.27)	0.0037 (0.34)
_cons	0.0827 (1.61)	0.0434 (0.97)	0.0452 (0.39)	
N	170			
R-sq	0.617	0.730	0.710	0.840
adj. R-sq	0.588	0.671	0.620	0.810
Breusch-Pagan/ Cook-Weisberg testfor heteroskedasticity	0.5908			
Ramsey test	0.2118			
Jarque-Bera normality test	0.1189			

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

On the other hand, FDI inflows demonstrate a positive effect only in the OLS model, whereas an effect could not be detected in the two other panel models, including the long-run estimation. hence, an increase of 1% in the FDI spillovers in the Asia Pacific

region, enhances military expenditures by 0.70%. Nevertheless, this only remains a partial assumption. Therefore, the existence of an effect in the OLS model was a key motivator to further assess the variable from a quantile regression dimension.

Table 3. Dependent variable Military expenditures (Quantile regression)

	Lower Quantile			Middle Quantile			Upper Quantile		
	Q10	Q20	Q30	Q40	Q50	Q60	Q70	Q80	Q90
INFND	0.136*** (3.44)	0.148*** (3.66)	0.0974 (1.92)	0.0526 (1.26)	0.0492 (1.80)	0.0417* (2.19)	0.0446** (2.64)	0.0462* (2.17)	0.0745* (2.49)
INFDI	0.0695 (1.18)	0.154** (2.87)	0.150*** (3.51)	0.0923* (2.59)	0.0959 (1.77)	0.118* (2.02)	0.109** (2.86)	0.0798 (1.53)	0.00870 (0.19)
INTR	0.0996 (1.87)	0.0428 (1.24)	0.0565 (1.56)	0.0915** (3.05)	0.090*** (4.09)	0.0925*** (5.55)	0.0967*** (8.17)	0.103*** (11.42)	0.110*** (8.47)
INFGDP	0.0603 (0.83)	0.115 (1.34)	0.0609 (1.15)	-0.0355 (-0.52)	-0.0271 (-0.33)	-0.0527 (-0.78)	-0.0703 (-1.66)	-0.0587 (-1.22)	-0.0441 (-0.94)
BE	-0.0145 (-0.20)	-0.0430 (-1.44)	-0.0435** (-2.78)	-0.0583** (-2.72)	-0.0549 (-1.42)	-0.126*** (-3.45)	-0.151*** (-6.42)	-0.157*** (-7.10)	-0.155*** (-8.69)
INTEV	-0.0583 (-1.46)	-0.0654* (-2.37)	-0.0279 (-1.04)	0.00916 (0.54)	0.0033 (0.17)	0.0283 (1.84)	0.0177 (1.50)	0.0163 (0.98)	-0.00434 (-0.24)
RSR	0.0640 (1.18)	0.0900 (1.73)	0.0372 (0.81)	0.00359 (0.11)	0.0112 (0.41)	0.0182 (1.03)	0.0212 (1.70)	0.00821 (0.56)	0.00202 (0.14)
_cons	-0.214 (-1.84)	-0.147 (-1.28)	-0.0409 (-0.46)	0.0577 (0.72)	0.0910 (0.93)	0.168 (1.59)	0.251*** (3.87)	0.303*** (4.63)	0.369*** (6.38)

p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The effect transpires in the lower and intermediate percentiles Q20, Q30, Q40, and Q60, with a value of 0.154, 0.150, 0.0923, and 0.118, whereas from the upper quantile the percentile Q70 displays a moderate effect of 0.109, respectively. Considering this significant effect of FDI inflows in the defense industry in accordance with the OLS model and the Quantile regression, one

explanation can be subtracted from this one-way effect, in which, when a country upholds peace and stability, FDI attractiveness increases. Alternatively, political instability reduces FDI spillover, and countries with higher instability and conflicts receive less FDI inflows (Aziz and Khalid, 2019). Indeed, such coherence supports the belief that nations with higher levels of

military spending are perceived as "secure" since they are able to safeguard their own borders, which in turn gives foreign stakeholders and investors the impression that investing in the given nation is a safe alternative.

One might take into consideration that; investors' sub-conscience provides us with a clear conviction that investing in countries with moderate defense spending attracts a scant percentage of FDI inflows. Several authors have highlighted the following point, as multinational companies do not merely consider the fundamental characteristics of the host nation while making plans to invest overseas, such as infrastructure, environmental assets, affordability, financial structure development, and the capacity to repay loans. But they worry about the assurance of a safe return on their foreign investment, which, practically, raises worries about political unpredictability (Pacific et al., 2017). This likelihood effect of FDI on defense expenditures further exerts and pushes states, indirectly, to avoid political confrontation, in order to not deter potential investors, considering, the cost of risk might outweigh the anticipated benefits for the investors.

It is also evident from the panel data findings that trade considerably affects military expenditures in the Asian pacific countries. the estimated coefficient was found to be 0.099 in the OLS, whilst a coefficient of 0.90 and 0.92 are projected from the fixed and the random effect models, signifying that a 1% upsurge in the level of trade in the selected countries leads to a 0.99%, 0.90% and 0.92% upsurge in military expenditures. These results are robust and validated by the FMLOS, which shows an interconnection between the aforementioned variables. the long-run estimates indicating a positive effect.

This reasoning can be interpreted that trade will boost tax income for the government, by encouraging trade partnerships and trade openness. The government can utilize this wealth to prevent the creation of social organizations that are independent of the state and might otherwise be tempted to seek political rights, as a result, needlessly, reducing defense expenditures to address those political and societal issues (Doces & Magee, 2015). Another budgetary implication might be also interpreted from the current findings, for instance, from a partnership agreement perspective, trade promotes peace, which reduces the need for more military spending. Likewise, the indirect effect of trade on military expenditures can be evoked, for example, Governments that promote open trade reduce the risk of military conflict (Papanikos, 2015). Implying, nations that are reliant on one another hesitate to get engaged in armed conflicts, of concern that war will obstruct commerce and foreign investment, as a result, interrupting trade would undercut many industries' revenue and undermine the level of economic growth including military spending.

GDP represents the level of growth of each Asia-pacific country, apparently, a negative elasticity can be discerned in the fixed and the random effect models. Hence a 1% decrease in the Asia pacific GDP, reduces military expenditures by 40%. Several interpretations can be made in this scenario, first due to the increased cost of defense, potentially through more purchased weaponry, economic development can have a negative impact on the military burden. Second, because more money is diverted to military spending, the government must either raise taxes or borrow money from the international capital market to maintain its budgetary flow, which tends to reduce productivity. Adversely, the following strategy raises interest rates, reduces investment and consumer demand, and promotes slow economic

development, which, is predominantly detrimental to economic progress, reversely, the defense sector would be impeded due to sluggish growth caused by higher military expenditures to the economy (Yildirim et al., 2005; Dirir, 2022). The Enabling Environment for Official Development Assistance and FDI Inflows: An Empirical Evidence from Djibouti. *Asian Journal of Economics, Business and Accounting*, 22(24), 193-207). Third, Military expenditure impacts resource allocation, which is also the theory behind orthodox economics' reliance on the crowding-out effect. Implying, by widening the saving-investment gap, the increased military spending may cause resources to be diverted away from useful uses. If the imports of armament items place a significant strain on the budget, it also causes a balance of payment issue for the economy. Overall, it is challenging to increase government revenue without running a budget deficit or taking out foreign loans. Consequently, higher defense spending is probably going to result in decreased spending in the nondefense sector.

On the other hand, the OLS estimates show a negative effect of bureaucratic effectiveness on military expenditures. The negative estimate remains unchanged even through all the percentiles, although the following effect starts to materialize only in the intermediate percentile until the upper percentiles, while the detection of an effect is nonexistent in the lower percentile, including in the FMLOS. Noteworthy, this negative impact implies that military spending is minimal—and that it is even decreased when there are strong political and economic institutions in place. Moreover, effective states address internal disputes amicably and without resorting to violence, creating the conditions for a peaceful resolution of international disputes by appealing to international competent organs (Papanikos, 2015; Compton, & Paterson, 2016). However, the following peaceful contextualization of bureaucratic effectiveness only exists in democratic countries.

Moreover, the FMLOS results show a long-run cointegration between the level of technological innovation and defense industry expenditures (0.007) significant at 1%. Comparing this with the panel data tripartite findings, only the fixed effect and the random provides consistency and matches the FMLOS results. Therefore, a good technology investment plan must be developed in order to guarantee technological development and address future security standards. The military must possess scientific and technological competence through its research, development, and acquisition operations if it is to create an ideal Force that is adaptable, deployable, nimble, flexible, potentially lethal, viable, and sustainable. Therefore, expanded manufacture of armaments that were predominantly created and developed before the start of conflicts is necessary for mobilization during times of war. Alternatively, the significant sums spent on R&D and related activities undoubtedly support new employment opportunities, the products sold to military customers are very seldom used in the civilian economy in their original form. As a result, they do not directly contribute to advancements in the productive capacity of the economy. Although, the level of indirect advantages connected with the application of information or technology initially generated with military R&D expenditures to civilian usage determines a large portion of the military's inventive influence on the civilian market rather than the state's productivity.

CONCLUSION

The paper seeks to contribute to the literature by incorporating several variables in the empirical analyses of factors contributing to military expenditures. In doing so, we included financial development, FDI spillover, bureaucratic effectiveness, technological innovation, trade, economic growth, and research & development. A total of ten countries located in the Asia-pacific regions were selected between 2005 to 2021. An OLS, fixed and random effect was employed whereas a quantile regression was used as an additional tool to capture the omitted effect of the panel data estimates, similarly, a non-parametric model (FMOLS) was performed in order to capture the long-run effect and establish more valid and robust results.

According to the panel data estimate, financial development, trade indicator, and technological innovation collectively contribute positively to defense expenditures in the Asia-pacific regions. The following result is also supported by the FMOLS estimates in which a long-run estimation has been materialized. This suggests, a sustained financial sector will assist the government in better addressing its military budget by providing a salient, healthy market that in turn will prevent financial instability which could have otherwise hampered and slowed the allocated budget to defense sectors, likewise, technological innovation will enhance labor market through channels that support civilian-military partnership based on innovative technological human manufactured; reversely the funding inflows from defense industries would reduce the unemployment rate.

On the other hand, FDI inflows showed a positive effect but only in the OLS model, and the Quantile regression. Confirming that, multinational companies and foreign investors base their investment choices on the premise that the host nation would provide strong security, reinforced by adequate military spending. Interestingly Economic growth and bureaucratic effectiveness showed a negative effect on military expenditures, demonstrating that increased military spending might have a negative impact on long-term production growth, and overemphasizing of allocating excessive budget to the defense industry could impede stock resources, investment productive capital, and other potentially growing sectors.

The study has several limitations, first, we only used one military expenditures variable, therefore, future studies could incorporate other factors proxying the military sector to further provide robust results and expand the study's implications. Similarly, it will be interesting to examine the effect of expenditures allocated to the military on infrastructure development as well as assessing from an ecological standpoint, as there are insufficient studies juxtaposing military spending with environmental performance. Moreover, the article is strictly focusing on several Asia-pacific countries, therefore it's relatively unsafe to generalize the application of such empirical findings to other countries, hence, upcoming research could consider south Asian countries and Latin Caribbean states in their studies. Finally, researchers can take into consideration the unbalanced spectrum of military expenditures in the context of GDP, subsequently, future studies could try to apply a comparative study between high income countries, middle-income and low-income states.

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