



Conflict Impacts the Scholarly Outputs: Evidence from the South China Sea. Dr. Rajesh Kumar*

Abstract

The objective of this study is to evaluate the scholarly research outputs on South China Sea conflict. Furthermore, the study attempts to characterize the behavior of scholarly research as they correspond to major incidents during the conflict. Accordingly, the consolidated scholarly research and the quantum funding of all disciplines related to the South China Sea are investigated and evaluated to enhance research understanding. Through a review of past research, the investigation of developed inquiries and the examination of indicators combined with an autoregressive model that examines an historical timeline, the impacts of the conflict are verified. Subsequently, the study develops a comparative and comprehensive examination of regional research perspectives, scholarly growth and funded outputs from various viewpoints. The results help to characterize the chronological wave of scholarly research and the history of the conflict. Finally, the study establishes the fluctuations in research outputs that eventually, consequences of the conflicts.

Index Terms: research relations, conflict impact, conflict-focused research, intellectual outputs, research behavior research directions, research funding, south china sea

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1. Introduction

In today's globalized world, regional conflicts affect international dynamics and diversify the impacts of such conflicts in many ways, including scholarly research and funding outputs. The South China Sea (SCS) dispute, which is the most recent conflict in Asia, has economic, political and strategic importance for the international community. This is a unique conflict, and the final settlement of this case will establish new principles regarding rights to global resources. Moreover, this case will also serve as an example for the establishment of new guidelines for all such impending controversial global issues.

This study aims to answer certain questions, for example, has the SCS conflict impacted the scholarly research outputs of associate countries, and if so, to what degree? These studies seek to determine what is actually happening (Diers, 1979) and to what extent do two or more characteristics tend to occur together (Payton, 1979). Such research provides input to facilitate the understanding of the patterns and processes associated with the planning of future studies (Wilson, 1969). An understanding of the foundation of the knowledge, enhances the knowledge, whereas the science of research creates a scientific paradigm that strengthens the individuals' capabilities to analyze the roots of the conflict and find enduring intellectual resolutions. As the comprehensive knowledge that is gained uncovers the hidden past and authenticates historical facts, the cohesive research resolves most of the conflicts during their embryonic stage.

The science funding, considered the key public source for the academic community, has an irreplaceable function in research development, scientist training and cultural construction (Vardakas, Tsopanakis, Pouloupoulou & Falagas, 2015). The state funding agencies allocate an appropriate amount of capital to gain a competitive edge over counterpart elements, and as a result, the aggressive policy of the Chinese establishes a correlation between scholarly outputs and funding of the SCS. The large-scale scientometric analysis of funding and funded research has become a major area of interest in recent years in, for example, the funding analysis in Nano research (Shapira, & Wang, 2010), the general study of natural science (Wang & Shapira, 2011), as well as social science (Xu, Tan & Zhao, 2015) and the interesting and in-depth observations in the specific field of mathematics (Zhou & Tian, 2014). Similar to state policy, research organizations play a vital role in decision making with respect to research funding that ensures the quality of research proposals through peer review based decision-making procedures (Mutz, Bornmann & Daniel, 2015).

To find the answers to the questions posed in this study, scientometric analysis and historical timeline analysis are used to measure the research outputs associated with major events related to the conflict. Data sets were compiled with research from Scopus, the most reliable and exhaustive database with indexes of more than 22,245 titles of major journals from 5000 leading publishers and nearly 88% of the leading research. It also covers the funding information of research outputs from almost all areas of knowledge and provides appropriate tools and advanced features to track, analyze and visualize research behavior. The major requisitions to understand the study concept included the inventory of research outputs, funded counts and geographical distributions along with logical comparative statements.

2. Review of Literature

The SCS conflict involves two group of countries that directly or indirectly actively participate in the dispute. The first group is comprised of the multi-dimensional disputes among the SCS regional countries, and the second group includes other countries that possess vested interests, foremost the United States of America (US) in terms of the interpretation of the United Nations Convention on the Law of the Sea (UNCLOS) and universal rights on natural resources (Bader, Lieberthal & McDevitt, 2014). The US has significant economic, political, and security interests at stake in the event that China does not slacken its ownership rights in the SCS (Bonnie, 2015). However, at another level, the conflict arising from the conflicting sovereignty claims in the SCS has continued, and indeed intensified, with China leading the escalation by focusing on denying rivals access to areas constructing artificial islands on disputed features (Joshi, 2016). The conflict involves the many disputes among the maritime boundaries and the islands, each of which involves a different group of countries. For example, four of the ten states in the ASEAN claim some or all of the land features in the SCS known as the Spratly Islands, which China and Taiwan also claim. Simultaneously, Vietnamese ships also began operating in the waters around the Parcel Islands in 2008 (Fravel, 2011a). The dispute includes the maritime boundary along the Vietnamese coast between China, Taiwan, and Vietnam; north of Borneo between China, Malaysia, the Philippines, and Taiwan; in the waters north of the Natuna Islands between China, Indonesia and Taiwan; and off the coast of Palawan and Luzon between China, the Philippines, and Taiwan. The dispute also includes the maritime boundary, land territory, and the islands of Sabah, including Ambalat, which is between Indonesia, Malaysia, and the Philippines, and the maritime boundary and islands in the

Luzon Strait between China, the Philippines, and Taiwan. The dispute also covers the islands, reefs, banks, and shoals in the SCS including the Paracel Islands, the Pratas Islands, Maccles Field Bank, Scarborough Shoal and the Spratly Islands between China, Taiwan, and Vietnam, as well as parts of the area also contested by Malaysia and the Philippines (U.S. Department of State, 2014). The diplomatic efforts made by the ASEAN countries over several decades to formulate a peace settlement resulted in no significant developments. Specifically, to date, the ASEAN member-states have different views on the issues associated with the conflict (Rustandi, 2016).

Since 1947, China has claimed sole ownership of the SCS, a claim that overlaps the Exclusive Economic Zone (EEZ) claims of Brunei, Indonesia, Malaysia, Philippines, Taiwan, and Vietnam, propounds the nine-dash line as substantiation, and further exacerbates the dispute (Sato, 2017). The Chinese nine-dash line policy turned this region into a war exercise field for the international community, even though the US insists that this line is inconsistent with international law and urges China to clarify its claims (NBAR, 2016). An international tribunal ruling against this line significantly contributes to offering a framework for a unified front against China, a factor that worries Beijing. Such a decision could "give more hope to the Philippines and other Asian countries that claim territory in the SCS," according to Andrew Scobell, a political scientist at the Rand Corporation (Rosenfeld, 2016). Other than the US, most of the conflict countries lack the strength to confront China, and hence, China dictates that these countries participate in binding agreements or find other ways to resolve their conflicts without weakening China's rights. Recently, the US and China took steps seemingly designed to generate at least a modicum of de-escalation, and most observers believe that the SCS issue will figure prominently on the U.S.-China agenda, as well as on the East Asian and Southeast Asian foreign policy agendas, for years, if not decades, to come. Furthermore, some regard the SCS as a crucible for a possible major international conflict or even, perhaps, a world war (Firestein, 2016). Clearly, the US, being a superpower and leader of the world, faces the negative waves over the conflict while it maneuvers for superlative interests, such as economic, political, and strategic dogma, and promotes "peaceful surveillance activities and other military activities without permission in a country's EEZ," which is allowed according to the rules of the convention (Lawrence & Lum, 2011). The understanding of the conflict is based on the consolidation of the reviewed facets of trade, economic, political and strategic consequences and judiciary developments followed by the worldwide repercussions of this consolidation. The scientometric analysis and relational study aligned with the aggrieved

conflict region will unlock another window of understanding. Kasia, Peter and Hans (2010) explained that given specific domains and organisational conditions, the theory can serve as a tool in setting research programmes as it gives insight on which settings could and should be created by research managers or policy-makers.

3. Data and Methods

The science of research not only consolidates the history of scholarly research on a precise theme but also investigates the indications of future research, such as research behaviors and directions of research growth. In fact, whereas indications and trends rely on research, research relies on data and analyses of facts and figures (Brown, 1977).

3.1 Research Questions and Hypotheses

Several important queries emerged while analyzing the data that highlighted certain aspects of the study results. For example, there were four situations where the analysis indicated that greater clarification, insight, and/or confirmation is required.

First (H01), there is no significant impact of conflict on changes in scholarly research outputs;

(H1) there is a significant impact of conflict on changes in scholarly research outputs.

Second (H02), there is no significant impact of conflict on changes in funding;

(H2)? there is a significant impact of conflict on changes in funding.

Third, (H03), the selected countries have produced a major share of scholarly research and funded higher research counts related to the SCS than other countries;

(H3) they have produced a minor share of scholarly research and funded less research counts related to the SCS than other countries.

Fourth, China, being the proclaimer of the entire SCS region, focuses on all conflict developments and believes itself to be the most aggressive researcher and funder of the highest research counts.

(H04), China has produced the highest number of scholarly research and funded the highest research counts in the SCS among all selected countries;

(H4), China has not produced the highest number of scholarly research and not funded the highest research counts in the SCS among all selected countries.

3.2 Study Limitations, Data Cleaning and Variables Applied

The key term, South China Sea, under article title, abstract, and keyword was paired with other aligned parameters to flush out the relevant data sets. The requisite data were recorded as either

all papers or funded Papers during the selected period from 2006 to 2015 where all papers includes all funded and non-funded papers and funded papers exclusively refer to papers that received a grant from a funding agency. The outline of the research ensures the focus of the study be confined to the selected countries, i.e., Brunei (BN), China (CN), Indonesia (ID), Malaysia (MY), the Philippines (PH), Taiwan (TW), Vietnam (VN), and the United States (US). (US Department of Energy, 2013). The funded counts are derived from the advanced search feature of Scopus using the following formula that contains 26 English letters and 10 Arabic digital characters, together with the truncation symbol *, that match the names of funding sources to ensure all funded papers are included. The search was altered, however, to capture the different data sets depending on the nature of the requirements, such as keyword, country and prefix or suffix, pubyear, etc.

(FUND ALL (*a* OR *b* OR *c* OR *d* OR *e* OR *f* OR *g* OR *h* OR *i* OR *j* OR *k* OR *l* OR *m* OR *n* OR *o* OR *p* OR *q* OR *r* OR *s* OR *t* OR *u* OR *v* OR *w* OR *x* OR *y* OR *z*)) AND (south China sea) AND PUBYEAR > 2005 AND PUBYEAR < 2016

The datasets in the Excel files are arranged to form sets of publications by sets of countries that are comparable with one another. For example, data require unification to compare similar variables, i.e., selected countries and worldwide data sets from 2006 to 2015.

The study was further divided into two phases. First, the comparative data were filtered, sorted and presented in the forms of text, tables, graphs and figures at appropriate places followed by analysis. Second, the data were calculated for the necessary relational measurements, and the subsequent AR (1) results were analyzed.

Several formulas were used to calculate the necessary statistics presented in the tables and figures.

Table-1: Formulas (F) for Measurement

F1: Funding Percentage, F%

The percentage of funded research to all researches. This indicator is used to measure the funding globally and for the selected countries.

Where as $F\% = \text{Funding Percentage}$; $F^O = \text{Funded Outputs}$;

$T^O = \text{Total Outputs}$

$$F\% = \frac{F^O}{T^O} \times 100$$

SCS Percentage, S%

This formula is used to measure the outputs percentage for the SCS globally and for the selected countries.

Where as $S\% = \text{SCS Percentage}$; $S^O = \text{SCS Outputs}$; $T^O = \text{Total Outputs}$

$$S\% = \frac{S^O}{T^O} \times 100$$

F2: Output Percentage, $O^%$

This formula is used to measure the percentage of selected countries worldwide.

$$O^% = \frac{SC^O}{G^O} \times 100$$

Where as $O^%$ = Outputs Percentage; SC^O = Selected Countries Outputs;
 G^O = Global Outputs

F3A: Growth %

$$\frac{\text{Present year counts} - \text{Preceding year counts}}{\text{Preceding year counts}} \times 100$$

F3B: Annual Average Growth Times

$$\frac{\sum \text{Growth times over years}}{\text{Number of years}}$$

F4: World Percentage Share, $G^{%S}$

This formula is used to measure the country percentage shares worldwide.

$$G^{%S} = \frac{C^O}{G^O} \times 100$$

Where as $G^{%S}$ = Global Percentage Share; C^O = Country Outputs;
 G^O = Global Outputs

4. Analysis and Discussion

The present study intended to establish the relationship among two potentials, albeit uncertain, phenomena, i.e., conflict events on the SCS and the impacts of those events on research outputs and funding of selected countries. However, while the usual periodic growth in research cannot be denied, the correlations of the simultaneous intontive behaviors of factors, i.e., occurrences of events and enhancements in research outputs, must also be recognized.

4.1 Impact of conflict on the research counts

To correlate the relationship between conflict and the research on the SCS, various perspectives were examined. The perspective of China as an aggressive country was the result of three factors. First, the concurrent relationships between China and its neighboring countries contribute to the developing conflicts given that, with the exception of a few, most of the neighboring countries are uncomfortable with the conduct of the Chinese. Second, also contributing to the perspective of China as an aggressor was the shrill and thundering reaction against the verdict of the UN International Tribunal Hague court and the subsequent aggressive maneuvers, such as exercises for war and the deployment of war vessels in the conflict region. Consequently, the established theory with respect to Chinese aggression is verified by the enormous research outputs.

Table–2: Country Total Outputs and Funding; Country Outputs for the SCS and Funding from 2006 to 2015 C⁰

	CN			F1			US			F1			TW			F1			MY			F1			VN			F1			PH			F1			ID			F1			BN			F1			Total			F1		
	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%	C ⁰	F ⁰	%															
<i>C⁰</i>	3481669	331041	9.51	6000556	358625	5.98	386382	13691	3.54	169841	4454	2.62	25351	1348	5.32	15716	497	3.16	35877	861	2.40	2082	74	3.55	10117474	710591	7.02																											
F4	13.92	33.27		23.98	36.04		1.54	1.38		0.68	0.45		0.10	0.14		0.06	0.05		0.14	0.09		0.01	0.01		40.44	71.41																												
<i>S⁰</i>	4689	2096	44.70	1061	549	51.74	587	101	17.21	285	40	14.04	142	22	15.49	86	11	12.79	38	12	31.58	14	2	14.29	6902	2832	41.03																											
F4	66.17	70.41		14.97	18.44		8.28	3.39		4.02	1.34		2.00	0.74		1.21	0.37		0.54	0.40		0.20	0.07		97.40	95.13																												

Table 4 presents the total country outputs, funded counts, and funding percentage shares for all disciplines. Similarly, it also indicates the same for SCS during the same period. The selected countries possess a major share of the outputs and funding for all disciplines. The funding for the SCS is 34.01% higher than the funding for all disciplines. It clearly depicts that the output share of the selected countries for the SCS is 56.96% higher than the output for all disciplines and indicates that the funding share of the selected countries for the SCS is 23.72% higher than the funding for all disciplines. The percent of funding is 30.97% higher than the worldwide percentage share for all disciplines, but the percent of funding for the SCS is 2.27% less than the worldwide percent share for the SCS. Overall, the highest outputs for all disciplines and funding are derived from the US, but the highest outputs regarding the SCS and the greatest funding between 2006 and 2015 from among the selected countries are provided by China. The US holds the largest share for all disciplines from among the selected countries, followed by China, whereas China has the largest share regarding the SCS, followed by the US. Brunei claims the last position from among the selected countries. The share of selected countries with respect to the SCS outputs is higher than that of the overall outputs for all disciplines. China exhibits the highest funding percentage for the SCS and the second largest share for all the discipline funding, whereas these data are reversed for the US, with the US funding the highest percentage of counts for all disciplines and the second largest share of funding for SCS, followed by Taiwan, Malaysia and Vietnam.

Table-3: Research Growth Trend of Research Outputs for All Disciplines.

T^O		F2		Years	F^O				F2	
G^O	F3A	SC^O	F3A		$O\%$	G^O	F3A	SC^O	F3A	$F\%$
Counts	Growth %	Counts	Growth %		Counts	Growth %	Counts	Growth %		
2846438	-1.81	1183344	0.11	41.57	2015	382109	1.20	263825	-3.70	69.04
2898948	2.28	1182021	-2.92	40.77	2014	377585	92.11	273973	83.90	72.56
2834445	3.63	1217609	7.52	42.96	2013	196542	1266.01	148976	1518.78	75.80
2735182	4.80	1132429	4.93	41.40	2012	14388	129.80	9203	143.47	63.96
2609945	6.29	1079211	8.22	41.35	2011	6261	20.08	3780	23.69	60.37
2455384	5.76	997256	7.84	40.62	2010	5214	29.25	3056	34.80	58.61
2321620	4.98	924759	8.29	39.83	2009	4034	29.75	2267	31.34	56.20
2211526	4.68	853998	7.88	38.62	2008	3109	-7.96	1726	-20.83	55.52
2112700	6.05	791636	4.82	37.47	2007	3378	37.43	2180	35.83	64.54
1992112	-	755211	-	37.91	2006	2458	-	1605	-	65.30
25018300		10117474		40.44	Total	995078		710591		71.41

Table 5 presents the research outputs for all disciplines worldwide, including the funding and share of selected countries, growth counts, growth times and selected countries worldwide percentage share. The highest growth recorded worldwide occurs in 2007, 2010 and 2011, while the highest growth recorded for the selected countries occurred in 2008, 2009, 2010, 2011 and 2013. The highest worldwide funding and selected countries funding was recorded in 2013, 2012 and 2014. The highest output percentage share of selected countries was observed during 2013, 2015, 2012 2011 and 2014, whereas the highest funding percentage share of selected countries was observed during 2013, 2014, 2015, 2012 and 2011. The annual average (F3B) global research output growth is 0.04 times that the previous year, while that of selected countries is 0.05 times that of the previous year. The annual average (F3B) global funding growth is 1.77 times the previous year, whereas that of selected countries 2.05 times that of the previous year. The overall growth of research outputs and funding for all disciplines worldwide and for selected countries increased between 2006 and 2015, and their growth is higher than that of worldwide outputs and funding. The selected countries produced the highest outputs from 2014 to 2015 and from 2013 to 2006 in decreasing order. The trend of worldwide outputs for all disciplines increased every year from 2006 to 2015. The highest percentage share of selected countries is noted for the years 2013, 2015, 2012 2011, and 2014, while it increases from 2006 to 2010. The figure presents the increasing chronological trend of worldwide outputs for all disciplines from 2006 to 2014, although it drops in 2015. In funding, however, it increases from 2006 to 2015. Furthermore, there is an increasing

trend of outputs from selected countries for all disciplines between 2006 and 2015, while with respect to funding, it increased from 2006 to 2014 but dropped in 2015.

Table-4: Research Growth Trend of Research Outputs for the SCS

		T^o						F^o			
G^o	F3A	SC^o	F3A	F2	Years	G^o	F3A	SC^o	F3A	F2	$F\%$
Counts	Growth %	Counts	Growth %	$O\%$		Counts	Growth %	Counts	Growth %		
1048	-8.47	1042	-5.27	99.43	2015	1216	0.58	1159	0.78	95.31	
1145	21.94	1100	17.52	96.07	2014	1209	139.88	1150	138.10	95.12	
939	26.21	936	28.04	99.68	2013	504	2700.00	483	2918.75	95.83	
744	2.34	731	2.09	98.25	2012	18	63.64	16	166.67	88.89	
727	14.85	716	14.74	98.49	2011	11	37.50	6	-14.29	54.55	
633	21.73	624	22.35	98.58	2010	8	14.29	7	0.00	87.50	
520	-2.07	510	3.45	98.08	2009	7	133.33	7	133.33	100	
531	35.11	493	31.82	92.84	2008	3	200.00	3	200.00	100	
393	-3.20	374	-0.53	95.17	2007	1	100.00	1	100.00	100	
406	-	376	-	92.61	2006	0	-	0	-	0	
7086		6902		97.40	Total	2977		2832		95.13	

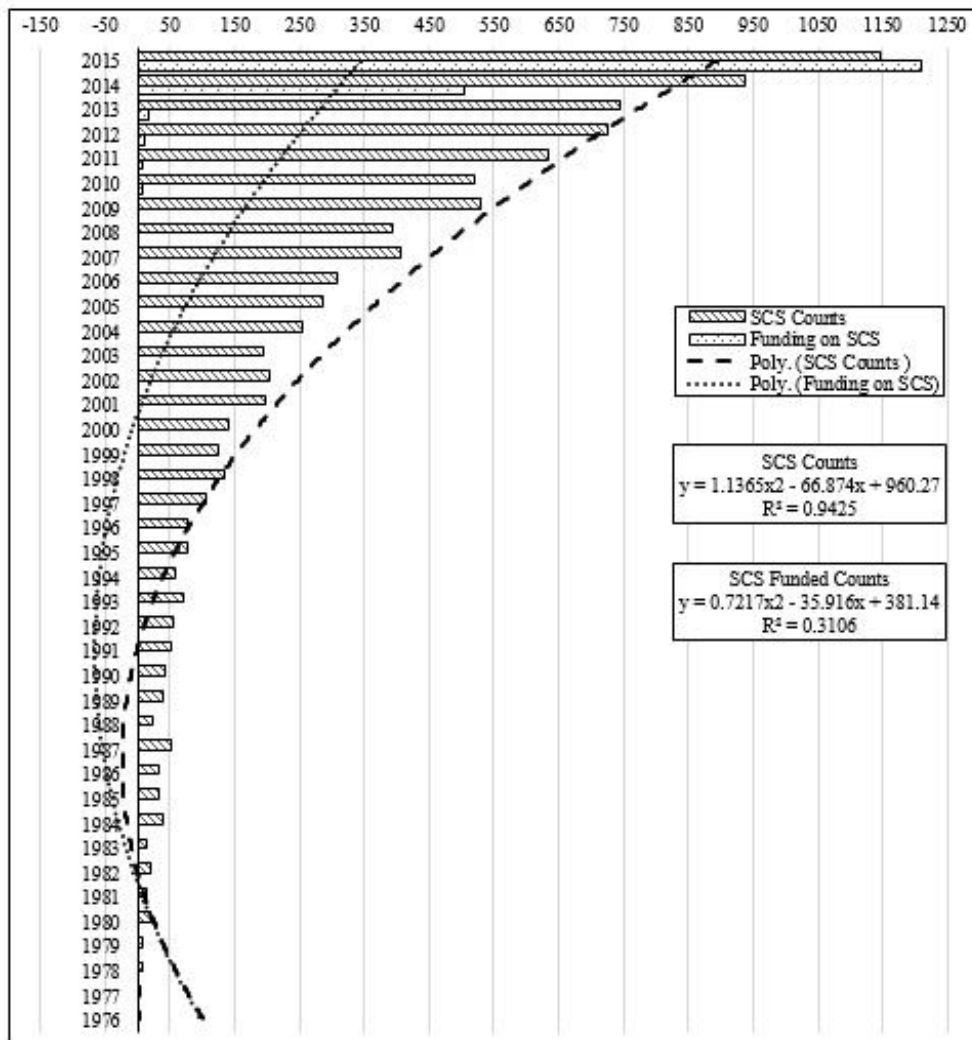
Table 6 indicates that there is an increasing trend with respect to global SCS research outputs between 2006 and 2015, except for the years 2007, 2009 and 2015. Furthermore, selected countries also exhibit an increasing trend, except for the years 2007 and 2015. The years 2014, 2013, 2008 and 2010 observed the highest global growth, while the greatest growth among the selected countries occurred in 2013, 2014, 2008 and 2010. With respect to SCS funding worldwide, an increasing trend was recorded from 2006 to 2015, and similarly, the selected countries also exhibited an increasing trend, except for the year 2011. The highest funding recorded, both globally and among the selected countries, occurred for the years 2014, 2013, 2007 and 2010. The annual average (F3B) global growth in research output is 0.12 times that of the previous year, whereas that of the selected countries is 0.13 times that of the previous year. The annual average (F3B) global funding growth is 3.77 times that of the previous year, whereas that for selected countries is 4.05 times that of the previous year. The trends regarding outputs, both worldwide and for selected countries in the SCS, indicate an increase every year from 2006 to 2015, but the highest percentage share of selected countries is observed in the years 2013, 2015, 2010 2011 and 2012. Figure 5 also presents the increasing chronological trend of global outputs related to the SCS between 2006 and 2015, except for a slight in 2007. However, with respect to funding, it increased from 2006 to 2015. From another perspective, an increasing trend of outputs from selected

countries for the SCS was observed from 2006 to 2015, with the exception of a slight decline in 2007 and 2015, whereas with respect to funding, it increased from 2006 to 2015. The selected countries have a greater share worldwide with respect to outputs and their funding percentage share is also higher than their research outputs for years 2014 and 2015. These findings confirm that multi-funding has been granted for the same studies.

4.2. Historical mapping of the conflict impact on research outputs

Figure 6 illustrates the research outputs of the SCS and funding of the SCS from 1976 to 2015. This figure also indicates the swings in research outputs due to the major conflicts. Initially, it was observed that the growth in research outputs during that period is the consequence of explicit occurrences during the preceding years. It is further noted that when a major clash occurred, an upsurge in research outputs was observed, as depicted in this figure.

Figure–1: Timeline of the SCS Outputs Prevailing to Occurrences of the Conflict Events



The first major conflict occurred in 1974, and as a result, China and Vietnam lost 18 and 53 soldiers, respectively (Kaushiva & Singh, 2014). Later, China took control of the Paracel Islands. The UNCLOS that was passed in 1982 claims that states can control territorial waters within 200 nautical miles off their shores. This area is known as the EEZ. Furthermore, the convention states that the areas that do not fall under the EEZ should be international waters shared by everyone and free for navigation and that this area shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured (United Nations: Office of Legal Affairs, 1982). Following the growing interest in maritime rights in Asia in the early 1980s, as well as the continued occupation of features by other claimants, China's leadership decided in early 1987 to establish a permanent position in the region by occupying nine vacant features. The plan was executed at the end of January 1988 when a PLAN task force arrived at the Fiery Cross (Yongshu) Reef. The Chinese move sparked a race with Vietnam to seize other unoccupied reefs in the area. On March 14, 1988, after the Chinese occupation of three features, a deadly clash occurred over Johnson (Chigua) Reef, in which Vietnam lost 74 lives. When the smoke cleared, China controlled six of the nine features in the original plan (Fravel, 2011b).

Another deadly incident occurred in January 2005 when Chinese patrol boats opened fire on Vietnamese fishing trawlers, killing nine crewmen (King, 2015). In 2008, the International Court of Justice (ICJ) settled overlapping claims of Pedra Branca and Pulau Batu Putih to Singapore and the Middle Rocks to Malaysia (ICJ, 2008). China has used diplomacy to prevent commercial activity in disputed waters. In the mid-2000s, Vietnam increased its efforts to develop its offshore petroleum industry in cooperation with foreign oil companies including the Oil & Natural Gas Corporation of India. In response, China issued fifteen diplomatic objections to foreign oil companies involved in exploration and development projects between 2004 and 2010 (Fravel, 2011c). The China National Offshore Oil Corporation has invested approximately \$20 billion to actualize its more optimistic estimate of 125 billion barrels of oil and five hundred trillion cubic feet of natural gas (Fensom, 2016).

In July 2010, US Secretary of State Hillary Clinton called for the People's Republic of China to amicably resolve the territorial dispute.¹ However, China does not want the US to play an active role in the conflict and prefers that the US be engaged in a more bilateral context (Liu, 2011).

1. Bill Summary & Status, H. Res. 352, 112th Congress, 2011-2012. (2012, December 10), Retrieved from <https://www.congress.gov/bill/112th-congress/house-resolution/352/text>

The US experts have conveyed that China is engaging in three types of warfare in the region, i.e., psychological warfare, media warfare, and legal warfare, and falsely accusing the US of destabilizing the region by supporting the Vietnamese perspective (Halper, 2013).

The US Department of Defense released a statement on August 18, 2010 in which it opposed the use of force to resolve the dispute (Lam, 2015). In 2012, China and the Philippines engaged in lengthy and tedious negotiations over the Scarborough Shoal dispute. Meanwhile, China iterated that the Scarborough Shoal is an integral part of Chinese territory and warned Manila not to take any action that could irreparably damage the China-Philippine relations (ANM, 2012).

However, on April 16, the Philippines and the US conducted their annual military exercise in Palawan (Meares, 2012). The core of the maritime disputes stems from China's increasingly strong assertion that it should control over 90 percent of the SCS. This runs directly counter to the claims of the Philippines and other Southeast Asian nations including Vietnam, Brunei, Taiwan, and Malaysia (Geib & Pfaff, 2016). When China moved a giant oil rig to the region in January 2013, the Philippines directly confronted Chinese coercive diplomacy by filing a statement of claim against China in the Arbitral Tribunal of UNCLOS. (Renato, 2015) In May 2014, China established an oil rig near the Paracel Islands, leading to multiple incidents between Vietnamese and Chinese ships (Chopra, 2016) and simultaneously, Taiwan reiterated its claim to the land features in the South China Sea as well as their "surrounding waters", i.e., The Spratly Islands, Paracel Islands, Maccles Field Bank and the Pratas Islands, as well as their surrounding waters, are inherent parts of Republic of China territory.¹ Following these events, the oil rig was eventually removed (Geib & Pfaff, 2016b, p.65). The tensions resulting from the territorial and maritime jurisdictional disputes between conflict countries have, for years, dominated the headlines of the South China Sea and defined the lens through which the issue is perceived (Nguyen, 2016). The international arbitration tribunal to the UNCLOS issued its final award on July 12, 2016, in a so-called compulsory arbitration instituted by the Republic of the Philippines against the People's Republic of China. After the Chinese revolted against the judgment, the area became a flashpoint with possible crucial global consequences. Incidents involving the Chinese and Philippine navies could occur although it is less likely that US ships exercising their freedoms and rights of navigation would be involved in these incidents.

1. Quoted in "Taiwan rejects advice to drop South China Sea claims," supra n 17 and "Former director's views on maritime claims his own: AIT," supra n 19.

China's position is unchanging, and its actions have negatively impacted the relations through a goal of fait accompli, especially its plans to establish an Air Defense Identification Zone covering the SCS (Tarnogorski, 2016).

4.3 Testing of Hypotheses

The validity of variables measurement was evaluated through the AR(1). To verify the hypotheses, we entered the data from the excel sheet in a computable form for, selected the conflict event years along with the simultaneous research outputs and funding counts of SCS. The following formula was applied to attain the irrefutable test result.

$$Y_t = \alpha + \beta_1 Y_{t-1} + \beta_2 (\text{Dummy for Conflict Year}) + \varepsilon$$

Where

Y_t = Scientific output \in year t ;

α = Intercept;

β_1 = Coefficient of Lag Value of Scientific output;

Y_{t-1} = Lag value of scientific output;

β_2 = Coefficient of Dummy for Conflict Year;

ε = error term.

The SCS count first difference is conducted annually, and the lag value is used for testing with the dummy value for the conflict event years to verify the significance of the impact of the conflict on changes in scholarly research outputs (H01)/(H1). To evaluate the impact of the conflict on scholarly research outputs, an assigned numerical dummy value of one (1) is used for the conflict event years and zero (0) is used for the conflict nonevent years and the contemporaneous value of scholarly research outputs and funding counts is further analyzed and tested by applying the autoregressive model. In the model, the values for event and nonevent conflict years are the independent variables and the value for scholarly research outputs and funding counts is the dependent variable.

Table–5: First Differential of the SCS Counts: AR(1) Model and Results

Summary Output						
<i>Regression Statistics</i>						
Multiple R	0.390650501					
R Square	0.152607814					
Adjusted R Square	0.106802831					
Standard Error	54.02527337					
Observations	40					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	2	19448.58397	9724.291985	3.33168585	0.04672641	
Residual	37	107993.016	2918.730163			
Total	39	127441.6				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	14.95208609	10.47930343	1.426820608	0.162016352	-6.280999539	36.18517172
SCS Lag	-0.112082678	0.170851169	-0.656025237	0.515867009	-0.458260028	0.234094672
Dummy for Conflict	52.20465664	20.29411528	2.57240367	0.014247461	11.08487321	93.32444007

First, AR(1) was used to regress the SCS counts using the dummy variable for conflict. This approach, however, revealed a problem with the unit root; thus, another regression model was applied on the first difference of the SCS counts using (Y) as the dependent variable and AR(1) as the conflict dummy. The result of this difference model denotes that the highly significant F statistic (3.331) is significant at the 5% level. Since the P-value of the dummy for conflict (0.01424) is less than 0.05, this indicates a significant impact (H1) on the dependent variable of the SCS counts difference. A coefficient of 52.204 indicates that during the conflict year, the SCS count difference increased by 52.204.

Table–6: First Differential Funding Counts of the SCS: AR(1) Model and Results

Summary Output	
<i>Regression Statistics</i>	
Multiple R	0.503140847
R Square	0.253150712
Adjusted R Square	0.213842855
Standard Error	117.0672785
Observations	41

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	2	176522.8068	88261.40339	6.440206365	0.003903	
Residual	38	520780.4127	13704.7477			
Total	40	697303.2195				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.121241094	21.37346366	0.005672506	0.995503695	-43.1471	43.38956
Lag Diff Funding	0.362767185	0.151050328	2.401631233	0.021318829	0.056982	0.668553
Dummy	70.22214446	44.47143134	1.579039449	0.122616302	-19.8056	160.2499

Similarly, as the SCS funding count first difference is conducted annually, the lag value is used for testing with the dummy value for the conflict event years to verify the significance or insignificance of the impact of the conflict on a change in scholarly research outputs (H2)/(H02). Since the P-Value of the lag difference funding is less than 0.05 and the lag difference funding for the dummy variable is 0.12, funding is significantly affected. However, the dummy for conflict is insignificant at the 5% level (H02), but significant at the 13% level (H2). Furthermore, the coefficient of 2.40163 for lag funding difference suggests that if a change in the previous year funding is 1%, then the change in the subsequent year funding increases by 2.4%.

The compactable data measured and analyzed through tables and figures related to enquires (H03)/(H3) verified that the (H03) major share of scholarly research outputs is produced by the selected countries and that with respect to enquires (H04)/(H4); yes (H03), China is the highest scholarly research output producing and highest research funding country among selected countries.

5. Concluding Remarks

The inferences proved that the conflicts between countries or regions have a certain impact on the research and further it revealed the trend in research outputs and funding of conflict associate countries. The investigation of the relationships between conflict events and scholarly research outputs related to the SCS demonstrated that the conflict had a significant impact on SCS research outputs, and a chronology of conflict occurrences on the research outputs is also confirmed. Second, while no significant impact of conflict on a change in funding is reported with respect to the increasing trend in funding, that lack of impact may be due to other factors. Third, the analysis confirmed that the conflict associate countries have produced a major share of research outputs and funded higher counts when compared to global outputs. Fourth, China has emerged as a

research trailblazer, producing the highest research outputs and funding the most research related to the SCS among the selected countries. The comparative growth of research outputs and funding research has revealed that China aggressively conducts and funds research on the disputed area, which raised international anxiety regarding conflict and indicated a compulsion to countermeasure and compete with China's aggressive research endeavors. Further, it has been determined that the top ten highest research producing organizations are from China, a result that indicates that the research war will become increasingly more aggressive not only among conflict countries but also among other power pillars. The study presents tangible facts and figures that may motivate other conflict countries to accelerate their research not only to counter the giant research aggression but to preserve their individual interests in the region. In this multi-faceted age, research could be an anti-aggression tool to peacefully protect the equal rights and maintain a balance of power. Scholarly competence begs the avoidance of such conflicts and their future consequences. Advances in research undoubtedly enhance a moral society of research and stimulate the country to counter the strength of unethical forces. The aggression of research outputs on the SCS conflict indicates much more aggression on ground zero in the near future which may be in the shape of short regional war or long cold war among associate countries. Further research outputs reflect that Chinese actions will be more aggressive and unpredictable unless appropriate responses from counterparts. Thus, funding policies for result-oriented research are liberally promoted specifically where unbalanced research outputs are observed. It may be a matter of further research for nations to produce huge research outputs, whereas an issue of liberal policies regarding research funding in focused regions could be a symptom of pre-aggression strategy. It is acknowledged that the results are significant even though there are many limitations to the study. Nonetheless, it was not possible to measure the intensity or degree of the impact of a conflict on the research outputs. Other factors that may impact research were unidentified and could be topics for further investigations. Hence, such matters are left for future research.

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