Global Power Shift

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Assessing China's Naval Power

Technological Innovation, Economic Constraints, and Strategic Implications

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Acknowledgements

Much of the research on the global naval arms production processes contained in this study is based on practical and theoretical insight gained during three years working as a naval analyst with shipbuilder Blohm + Voss, where I was charged with studying naval developments around the world. In that role, I was in a position to observe several ongoing naval projects in Western countries in various stages of completion; conduct interviews with shipbuilding and naval electronics executives from various countries and industry backgrounds, in some cases with work experience reaching back several decades, in a transnational setting; interact with navy delegations from a number of countries including China; work with an interdisciplinary team of experts on a wide range of analyses of producers' strategies, naval customer countries' political and security environments, and whole regions' and subregions' naval development tendencies; and conduct postmortems on a number of failed projects. As someone who had to learn the art of judging warships from scratch in a relatively short time by conducting analyses for people trying to solve practical problems, I sympathize with everyone who cannot tell a corvette from a frigate. Therefore, in the present study I tried to avoid obscure jargon as much as possible and have taken pains to explain some basic facts and premises that are often left unsaid in the more specialized literature. While experts may want to skip these parts of the study, I still recommend consulting them in order to better understand the evaluations later made.

Some of the ideas put forward in this volume have been previously published in a short book chapter, which in turn was based on a longer conference paper.[1] Nevertheless, most of the content is entirely original, and many of the earlier

[1] For the conference paper, see Kirchberger, Sarah. 2011. China's Rising Naval Power and Its Impact on Global Power Shift. Paper presented at the ISA Annual Convention 2011 at Montréal, Quebec, Canada, March 16–19, 2011. 31 pp. For the book chapter, see Kirchberger, Sarah. 2012. Evaluating Maritime Power: The Example of China. In *Power in the Twenty-first Century. International Security and International Political Economy in a Changing World,* ed. Enrico Fels, Jan-Frederik Kremer and Katharina Kronenberg, 151–175. Berlin et al.: Springer.

conclusions and interpretations had to be refined, if not entirely revised, after reviewing the rapidly expanding knowledge available on the topic during the past four years.

Hiroki Takeuchi was the first to propose turning the draft conference paper into a full-fledged book project during ISA 2011 at Montréal. His encouragement and constructive criticism were of crucial importance at that point, and this book would probably not exist without it. Further and equally important support was extended to me by Enrico Fels and Maximilian Mayer of Bonn University, and I have to thank Enrico for the invitation to publish a short version of the 2011 paper in an edited volume. I am grateful to Gu Xuewu of Bonn University for the invitation to join his panel at the DVPW conference in October 2011 in Munich, and to him and Enrico for the invitation to publish this study in their Global Power Shift series with Springer. The staff at Springer, especially Barbara Fess and Johannes Glaeser, have done a wonderful job of bringing this book into existence. Many thanks are also due to Christopher Reid for his superb copyediting.

Gudrun Wacker of Berlin's Stiftung Wissenschaft und Politik (SWP) and Nicola Spakowski of Freiburg University have, on different occasions in 2011 and 2012, commented on draft paper presentations and offered constructive criticism. So has Shi Ming, who was available to me several times for inspiring exchanges of ideas on the subject matter of China's defense development, and he in particular has broadened my understanding of domestic Chinese discourses by pointing out interesting Chinese language materials.

With regard to understanding the technical aspects of the topic at hand, I owe an enormous debt of gratitude to naval architect Jörg Möller of ThyssenKrupp Marine Systems' Blohm + Voss naval yard, who during 2007 through 2010 patiently shared his expert knowledge with a young and fairly clueless colleague. Together with Henning Waschk and Norbert Schlichthorst, he effectively tutored me in all kinds of related knowledge areas. After I left the company to join the faculty of the University of Hamburg in 2010, Jörg generously agreed to support this research project by commenting on drafts and giving his opinion on technical data during several interviews. He has also read through the entire manuscript. The support of a technical expert of his caliber and experience has been invaluable; I do not know how to properly thank him for all the time and thought he invested. For comments on Chap. 5, I am also grateful to Uwe Sievert, Andreas Grudda, and Bernd Kulmus. It goes without saying that all technical errors remaining in the text are purely my own responsibility.

Several other former colleagues at ThyssenKrupp Marine, among them retired officers of the German, Turkish, Greek, Swedish, and South African naval forces, have during my time there explained obscure technical facts and naval strategy matters, or given their insight on the multifaceted phenomenon of global naval industry development, or worked with me on puzzling aspects of defense industrial development from a national perspective. These include Thomas Scheiter, Oliver Andresen, Reinhard Mehl, Thomas Ruckert, Wolfgang Bohlayer, Patrick Kaeding, Karl-Otto Sadler, Jonathan Kamerman, John Nilsson, Ahmed Tüfekcioglu, Ioannis Manolemis, Ektor Kalathas, and Sonja Langner, to name just a few in no particular

order. I would also like to collectively thank the numerous representatives of other international shipbuilding and systems companies who I met and worked with during those years, and also the active service members of various naval forces who I had the chance to meet, exchange ideas, and discuss ships with. It was a pleasure working with and learning from all of these people of various professional backgrounds and nationalities, and their viewpoints on a multitude of naval issues are in some form or other reflected in this study.

In 2012, I was extremely fortunate to meet Chang Ching when this project was already well underway. His support enabled me to present some preliminary results on Taiwan and engage in discussions with a number of Taiwanese experts, among them Alex Huang, Arthur Ding, and Eric Shih, during several presentations and workshops in Taipei and the surrounding area. Their questions and comments were invaluable for the development of this study. Lately, Joachim Gutow of the Military Academy of the German Armed Forces (FüAK) has been available to me several times for interesting discussions of Asia's naval development, and so has fellow sinologist Oliver Corff. Both have given me comments on parts of this study for which I'm immensely grateful.

Many thanks are due to my colleagues at the University of Hamburg. It is by no means natural for scholars in the humanities to accept research topics as martial as this one, and I am only too keenly aware of how much this project must have strained some colleagues' capacity for intellectual tolerance. Completing a book project next to normal term work is especially challenging, and I fondly remember all the large and small instances of practical support extended to me. At the Asia-Africa-Institute (AAI) I am especially grateful to Ni Shaofeng, who read through the entire manuscript, pointed me to relevant materials, and offered support and encouragement throughout; to Hans Stumpfeldt and Michael Friedrich, who many times gave me interesting materials, and sometimes carried them to me from afar; to Ruth Cremerius, whose benevolent presence and serene judgment helped immensely when trying to balance research work, teaching load, and other academic responsibilities; and to Monika, Kai, Karin, Charlotte, and Liu Dongdong, for being exceptionally supportive colleagues. At the Department of Economics, Michael Funke never forgot to point out articles on a great variety of related topics to me and has offered valuable comments on Chaps. 2 and 3 of this study. Unfortunately, it is with sorrow that I have to acknowledge the intellectual debt to my esteemed late teacher during undergraduate years at the University of Hamburg, archaeologist Helmut Ziegert, who in the 1990s taught me a method of structuring research and organizing data. His emphasis on the need to think interdisciplinary and "laterally" has been a major source of inspiration for the approach chosen in this volume. I will continue to miss the lively discussions with him.

Last but not least, I am indebted to my friends and family for their practical and spiritual support throughout these past four years. My father has read through the entire manuscript. It must have been his lifelong enthusiasm for all things maritime that got me interested in naval matters in the first place, not least because I had the opportunity to spend large portions of childhood aboard yachts and ferries. The

injured party has been my 11-year-old, who on various occasions expressed indignation at being "neglected" due to her mother's "excessive workloads." She may have a point there. I have to thank her for graciously allowing me to continue writing this "boring and pointless" book at least during the wee hours, and to her father and grandparents for helping out with childcare whenever necessary. Jonas, Lydia, Albrecht, Christina, and Niklas have been patient with me for years whenever I went off on some tangent of naval shipbuilding and have been supportive when needed. Finally, ever since Jan came into the picture, he has contributed in numerous ways to this study's stock of ideas, found interesting materials for me to look at, and helped with many thoughtful suggestions. Most of all, I am grateful for his steady encouragement, because his unwavering faith in this project, and in my ability to carry it through, has helped me over many a hurdle.

Acronyms and Abbreviations

AAD	Advanced air defense
AAW	Anti-air warfare
ADIZ	Air defense identification zone
AESA	Active electronically scanned array
AEW	Airborne early warning
AIP	Air-independent propulsion
ANCS	Advanced naval combat system
APAR	Active phased array radar
ASBM	Anti-ship ballistic missile
ASCM	Anti-ship cruise missile
ASEAN	Association of Southeast Asian Nations
ASM	Anti-ship missile
ASuW	Anti-surface warfare
ASW	Anti-submarine warfare
AVIC	Aviation Industry Corporation of China
B2G	Business-to-government
BICC	Bonn International Center for Conversion
bn	billion
BRIC(S)	Brazil, Russia, India, China (and South Africa)
BTI	Bertelsmann Transformation Index
C	Cruiser
C2	Command and control
C4ISR	Command, control, communications, computers, intelligence, surveillance and reconnaissance
CAJ	China Academic Journals
CATOBAR	Catapult assisted take-off but arrested recovery
CCP	Chinese Communist Party
CDS	Combat direction system
CEC/ CEDA	China Enterprise Confederation/China Enterprise Directors Association

CEO	Chief Executive Officer
CETC	China Electronics Technology Group Corp.
CG	Coast guard *or* Guided-missile cruiser
CIA	Central Intelligence Agency
CIWS	Close-in weapon system
CM	Cruise missile
CMC	Central Military Commission
CMS	Combat management system
CNP	Comprehensive National Power
CNPEC	China Nuclear Power Engineering Co.
CODAD	Combined diesel and diesel
CODAG	Combined diesel and gas
CODLAG	Combined diesel-electric and gas
CODOG	Combined diesel or gas
COGAG	Combined gas and gas
COSCO	China Ocean Shipping (Group) Company
COSTIND	Commission for Science, Technology and Industry for National Defense
CPMIEC	China Precision Machinery Import-Export Corporation
CS	Combat system
CSI	Combat system integration
CSIC	China Shipbuilding Industry Corporation
CSOC	China Shipbuilding & offshore International Co.
CSSC	China State Shipbuilding Corporation
CSTC	China Shipbuilding Trading Co.
CTOL	Conventional take-off and landing
CV	Aircraft carrier
CVA	Attack aircraft carrier
CVL	Conventionally powered aircraft carrier
CVN	Nuclear-powered aircraft carrier
CVW	Carrier air wing
dB	decibel
DCNS	Direction des Constructions Navales
DD	Destroyer
DDG	Guided-missile destroyer
EADS	European Aeronautic Defence and Space Company (since 2013 Airbus Group)
EDA	European Defence Agency
EEZ	Exclusive economic zone
EMALS	Electromagnetic aircraft launch system
EMPAR	European multifunction phased array radar
EU	European Union
EW	Electronic warfare
FAC	Fast Attack Craft

FC	Fire control
FDI	Foreign direct investment
FF	Frigate
FFG	Guided-missile frigate
FFL	Light frigate
fl	full load
FMF	Foreign Military Financing
FMS	Foreign Military Sales
FREMM	Frégate européenne multi-mission/Fregata europea multi-missione
FS	Corvette
G.E.	General Electric Co.
G2G	Government-to-government
G7	Group of seven
GDP	Gross domestic product
GMI	Global Militarization Index
GNP	Gross national product
GRT	Gross registered tons
GT	Gas turbine
HR	Human resources
Hz	Hertz
IC	Industrialized country
IPO	Initial public offering
IWS	Integrated warfare system
JMSDF	Japan Maritime Self-defense Force
km	Kilometer (1 km = 0.53996 nm)
LAN	Local area network
LHD	Landing helicopter dock
LNG	Liquefied natural gas
l.o.a.	Length over all
LOS	Line-of-sight
LPD	Landing platform dock
LST	Tank landing ship
m	meter
MCMV	Mine countermeasures vessel
MESMA	Module d'Energie Sous-Marine Autonome
MoD	Ministry of Defense
NATO	North Atlantic Treaty Organisation
NBC	Nuclear, biological and chemical (warfare)
NCO	Non-commissioned officer
NFU	No first use (of nuclear weapons)
NIC	Newly-industrialized (or industrializing) country
nm	Nautical miles (1 nm = 1.825 km)
NPT	Non-Proliferation Treaty
ONI	Office of Naval Intelligence

OPEC	Organization of the Petroleum Exporting Countries
OPV	Offshore Patrol Vessel
OTH	Over-the-horizon
OTHR	Over-the-horizon radar
PAAMS	Principal anti air missile system
PACOM	United States Pacific Command
PB	Patrol boat
PC	Patrol craft
PLA	People's Liberation Army
PLAN	People's Liberation Army Navy
PLANAF	People's Liberation Army Naval Air Force
PPP	Purchasing power parity
PRC	People's Republic of China
PV	Patrol vessel
R&D	Research and development
RAM	Rolling airframe missile
RIMPAC	Rim of the Pacific Exercise
RMA	Revolution in military affairs
RMB	Renminbi
ROC	Republic of China
RSC(T)	Regional security complex (theory)
S&T	Science and technology
SAC	Second artillery corps
SAM	Surface-to-air missile
SAR	Search-and-rescue
SCO	Shanghai Cooperation Organisation
SIPRI	Stockholm International Peace Research Institute
SLOC	Sea lines of communication
SM	Standard missile
sq	Square
SS	Submarine
SSB	Ballistic missile submarine
SSBN	Ballistic missile submarine, nuclear
SSDS	Ship self-defense system
SSGN	Cruise missile submarine, nuclear-powered
SSK	Attack submarine, conventional
SSM	Surface-to-surface missile
SSN	Attack submarine, nuclear
STOBAR	Short take-off but arrested recovery
STOVL	Short take-off and vertical landing
t	ton
TKMS	ThyssenKrupp Marine Systems
TRA	Taiwan Relations Act
UNCTAD	United Nations Conference on Trade and Development

U.S.	United States
US$	U.S. Dollar
USM	Underwater-to-surface missile
U.S.N.	U.S. Navy
UHF	Ultra-high frequency
UK	United Kingdom
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
USSR	Union of Soviet Socialist Republics (or Soviet Union)
VDS	Variable-depth sonar
VHF	Very high frequency
VLS	Vertical launch system
WTO	World Trade Organisation

Global Power Shift

Comparative Analysis and Perspectives

Ample empirical evidence points to recent power shifts in multiple areas of international relations taking place between industrialized countries and emerging powers, as well as between states and non-state actors. However, there is a dearth of theoretical interpretation and synthesis of these findings, and a growing need for coherent approaches to understand and measure the transformation. The central issues to be addressed include theoretical questions and empirical puzzles: How can studies of global power shift and the rise of 'emerging powers' benefit from existing theories, and which alternative aspects and theoretical approaches might be suitable? How can the meanings, perceptions, dynamics, and consequences of global power shift be determined and assessed? This edited series will include highly innovative research on these topics. It aims to bring together scholars from all major world regions as well as different disciplines, including political science, economics and human geography. The overall aim is to discuss and possibly blend their different approaches and provide new frameworks for understanding global affairs and the governance of global power shifts.

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Dedicated to the memory of my grandfather
L.I. Suurla

Contents