Geotechnology and Global Change

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Special Section Article

Amongst the mega-trends of our age – multipolarity, urbanization, individual empowerment, resource stress, demographic shifts and others – technology stands out for its ubiquity and impact on major aspects of social, political and economic life. This special section of *Global Policy* asks whether a paradigm shift is needed in the primary lens through which we interpret global change: from geopolitics and geoeconomics to geotechnology.

In contrast to the former two, geotechnology emphasizes the role of technology in shaping global order by examining the rapid diffusion of innovation in leading technology sectors, how diverse actors in the system leverage technology to enhance their own power and influence, and the role of technology in defining global regulations and governance. By elevating technology alongside military power and economic leverage as a driver of global change, the geotechnology approach is meant to complement, not replace, geopolitics and geoeconomics. Put simply: to what extent does the balance of innovation shape the balance of power?

The essays in this section robustly capture the pathways by which new technologies create economic and geopolitical tensions that require urgent attention. What this fundamentally underscores is the reality that with globalization's expansion across the world, the sources of innovation and repositories of power have diversified considerably since the end of the Cold War. Importantly, then, unlike conventional geopolitics or geoeconomics, geotechnology fully acknowledges the current systemic evolution towards a both a multipolar but also a post-Westphalian order in which a wide range of geographies (including South America, the Middle East and Asia) as well as milieu of actors across the public, private, and civic sectors play important roles in developing technologies, shaping challenges and participating in collective action. As innovative capacity continues to rapidly diffuse, we will need to calibrate our assessments of the impact of technologies on power dynamics more frequently.

Given the vast spectrum of technologies with significant global reach and impact – from social media to pharmaceuticals to alternative energy – this collection of essays focuses on both the systemic trends related to innovation clusters and commercialization, as well as specific breakthroughs such as additive manufacturing, bio-enhancement, and hydraulic fracking. Each contribution surveys the potential of various technologies, the competitive dynamics underway among actors seeking to maximize benefit from them, scenarios for how they will unfold and shape power relations, and policy recommendations related to their advancement and governance. Collectively, this volume contributes to the growing body of research on how emerging technology areas interact with each other, what policy issues arise from those interactions, and how institutions might adapt to manage those challenges.

Whether new technologies emerge quickly or slowly, they are inevitably disruptive of existing patterns. These essays are therefore interdisciplinary in nature, considering the ethical, legal, commercial, regulatory, military and other dimensions of the subject. The resulting picture is of global policy in a state of flux, confronted by issues that it is presently ill equipped to govern. The authors of the essays within are therefore to be commended for briefly but comprehensively setting forth technologies and challenges that are in the earliest phases of mainstream discourse, and providing far-sighted and mature policy guidance for leaders to consider.

I wish to thank all the contributors for sharing their deep expertise in highly important technological fields and for their efforts to speculate on the potential consequences of technological diffusion while providing concrete prescriptions for policymakers. I also sincerely thank Eva-Maria Nag, *Global Policy's* editor-in-chief, for inviting me to serve as guest editor for this special section, which I hope will spark wide conversation and debate in the scholarly and practitioner communities.

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