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Bridging International Relations and Innovation Studies: Lessons from Two Communities

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Over the past few years, geopolitical competition has been increasing, and this competition has become largely technology-based (OECD 2023). In an innovation system that is highly globally intertwined, this raises a complex dilemma for governments (see Table 1). On the one hand, maximally integrating into these systems enhances innovation and therefore competitiveness and the ability to address societal challenges such as climate change, but it increases risks of weaponized interdependence when becoming too dependent on adversarial states. On the other hand, closing off and securitizing innovation grants more autonomy, but risks running behind in international technology-based competition when not being able to reap the benefits of open knowledge flows, interactions, and learning about the most advanced technologies (Tan et al. 2025; Edler et al. 2023; Lee et al. 2024).

This question touches directly on the academic fields of International Relations (IR) and studies. It is therefore increasingly being studied by related academic communities in Europe, such as the Eu-SPRI forum (innovation policy) and EISA-PEC (IR). As a PhD Candidate in innovation policy with a background in IR, I visited both their conferences this summer to see how the two communities approach this question and, more importantly, what they can learn from each other.

The European Forum for Studies of Policies for Research and Innovation (Eu-SPRI Forum) represents a research field evolving since the 1960s at the encounter of economics, political science, sociology, Science and Technology Studies (STS), business administration, geography, and history. Historically, the field has focused on two rationales or 'frames' for engaging in innovation policy, the first being addressing market failures. Examples are uncertainty about outcomes and short investment horizons, which lead to a chronic undersupply of private R&D funding, with companies tending to favor easily applicable, incremental innovation over fundamental research with greater potential for radical breakthroughs. After the Second World War, during the early Cold War, Western governments started institutionalizing supply-side innovation policies to fix such market failures. Popular instruments are R&D subsidies or tax credits for knowledge-intensive companies, which remain the cornerstone of many present innovation policies, also, for example, in the Draghi report on the European Union's (EU) competitiveness. Towards the end of the Cold War, the focus expanded to a second frame: creating competitive national innovation systems in a globalizing world by addressing system failures, such as weak university-industry links, which impede the commercialization of research. Various models emerged to assess how interactions between different actors shape innovation and to identify gaps governments can address, including the university-industry-government 'Triple Helix' model (Etzkowitz and Leydesdorff 2000), (technological) innovation systems (TIS) (Hekkert et al. 2007), and entrepreneurial ecosystems (Stam 2015). Staying in the Netherlands, an example can be found in Brainport Eindhoven, grouping Eindhoven University of Technology with high-tech companies like ASML, currently at the heart of global technology-based competition.

Since the mid-2010s, the field has expanded its focus to a third frame, not only studying how to facilitate R&D investments and innovation systems, but also how to actively create and support markets for promising innovations, steering demand towards addressing societal challenges such as climate change and healthcare in times of an aging population (Schot and Steinmueller 2018; Weber and Rohracher 2012; Mazzucato 2016). For instance, governments can act as lead customers for green innovations by incorporating such innovations in their public procurements or

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using regulations and standards to raise the bar and direct innovations towards specific policy goals (Edler and Georghiou 2007). These three frames for innovation policy, until recently, all focused on a situation displayed by the upper left quadrant of Table 1, i.e., reaping the benefits of global knowledge exchange and learning. Recent geopolitical developments, such as a more assertive China on the global stage and increasing US isolationism, led to increased attention in the EU for the role innovation policy can play to stay ahead in such competition, as well as the risks of global technology-based competition, as displayed in the other quadrants in Table 1. Consequently, Edler et al. (2023) suggested a fourth innovation policy frame in the shape of technology sovereignty, i.e., the capacity of a state to develop or source critical technologies for welfare, competitiveness, and autonomy, without one-sided dependencies.

At Eu-SPRI 2025, three of the thirty parallel sections explicitly focused on security-related issues. One section focused primarily on a conceptual level on how calls for more autonomy affect the capacity of governments to enhance innovation and address other societal challenges. One presentation outlined, for example, how European countries' pledge to increase their defense budgets to 5% of GDP can be framed as a traditional supply-side 'technology push' policy based on R&D subsidies (frame 1). Without using parts of this budget to actively create markets for European innovations (frames 3 and 4), for example, by using (pre-commercial) public procurement as a tool to stimulate defense innovation, it merely deepens dependencies on the US military industry. It also decreases budgets for other innovation policy goals, such as sustainability transitions. A version of the presentation can be found on the LSE European Politics and Policy blog (Frenken 2025). Sections on specific research and innovation topics exhibited more in-depth, empirical work. For example, a section on research security (frame 2) and dual-use innovation examined how institutions and governments navigate the tension between scientific openness and collaboration on the one hand, and security risks and uneven responses between and within research systems on the other. A synthesis of this section's conclusions can be found on this blog of the University of Manchester (James and Flanagan 2025).

Looking back at Eu-SPRI and relating it to the dilemma presented in Table 1, I figured that the current innovation policy literature mainly focuses on the balance between the upper left and the bottom right quadrant. More specifically, on the question of how to make interactions safer, and the consequences of decreased interactions on the capacity to innovate. An example is the growing attention on how to safeguard critical technologies (top right quadrant), grouped around the concept of technological sovereignty. Overall, present studies are mainly concerned with how geopolitics affect current innovation practices and goals, and less with offensive practices of weaponized interdependencies (bottom left quadrant), or the role of innovation in creating competitive advantages in geopolitical competition. For these topics, one has to turn to IR.

The Pan-European Conference on International Relations (PEC) is the main annual event of the European International Studies Association (EISA). Work presented at EISA-PEC tends to focus on conceptual rather than methodological strength due to the events-driven nature of the discipline. A keynote panelist described that, in times of relative peace and multilateral cooperation, the discipline turns liberal and pro-interdependencies, while in times of increased global competition and tension, IR scholars quickly leave their former love for liberal theories, and realists advocating for economic autonomy prevail. Resonating with standard work on scientific revolutions (Kuhn 2012), as conceptual agreement is lacking, there is limited room for empirical and methodological depth.

At EISA-PEC, five out of 34 special parallel sections were related to technology and innovation, next to 23 standing sections on more classical IR topics (e.g., "Realist thought, theory, and analysis in IR"). Due to strong links with the constructivist and qualitative research-oriented field of STS, several sections showed how technology as a social-political construct shapes power and security in international relations, mainly at the individual technology level. For example, a section with researchers from the Intimacies of Remote Warfare project brought together critical perspectives on the concept of "responsibility" in the context of algorithmic and remote warfare. Overall, however, less attention was dedicated to the question of where technology actually comes from and how governments can support promising innovations. Where this was done, innovation was presented as a rather linear process, without much attention to the systemic nature of the innovation process (frame 2), or the delicate political process of mobilizing and steering demand (frame 3), extensively studied in the innovation policy literature.

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Notable exceptions here were sections by the REMIT and ReGlobe research projects. The latter organized a high-quality International Political Economy section on geopolitics and economic statecraft, entailing qualitative and quantitative empirical work on economic statecraft and geoeconomics. Research focused on how states deploy economic instruments and leverage interdependencies to pursue foreign policy goals, shape power relations, and manage international competition (Babić et al. 2024). In this community, instruments are reframed as “market-creating”, “market-correcting”, “market-intervening”, and “market-directing” (Van Apeldoorn and De Graaff 2022) instead of instruments categorized by market, system, and demand-steering failures (Schot and Steinmueller 2018; Weber and Rohrer 2012). Unlike the innovation policy literature, this community clearly distinguishes between such policies’ national and international/geopolitical dimensions. For example, Van Apeldoorn and De Graaff (2022) argue that through (partially) state-owned enterprises, Sovereign Wealth Funds, or international investment by the government or supported domestic firms, states can direct or control markets beyond their own borders to pursue their own foreign policy goals. However, the policy fields discussed at EISA-PEC were much broader than at Eu-SPRI, primarily focusing on industrial policy, trade, finance, and supply chains, with limited attention to innovation policy. This leaves the question of where innovation comes from and how geopolitics might enhance or impede its emergence largely unresolved, which is problematic considering the observation that competition is fiercest in the technology domain (OECD 2023).

Relating my insights from EISA-PEC to the dilemma in Table 1, I would argue that this European IR community is mostly preoccupied with how to move away from the bottom left quadrant (risky dependencies in a highly intertwined global economy), towards the upper right quadrant (maintaining autonomy and power in such an economy). Studies also focus on moving to the upper left quadrant, but only consider attention as a means to stay ahead in geopolitical competition rather than using it to address other societal challenges. Consequently, less effort is devoted to the costs of reduced knowledge flows and cross-border learning (bottom right quadrant), especially in light of other policy goals that might receive less attention and budgets due to increased geopolitical tensions, such as sustainability transitions.

Both fields focus on different parts of the technology-based international competition dilemma as presented in Table 1. Innovation studies are mainly concerned with how geopolitics and international security affect current practices and goals, and less with how innovation policy also shapes geopolitics. Conversely, IR is very well aware of innovation and technology’s role in international competition, but only to a limited extent scrutinizes where these capabilities come from and how geopolitical choices might affect innovation policy.

Combining insights from both fields could offer a more holistic view of the dilemma presented in the intro. For example, it would be interesting to look at how the technology-based international competition dilemma affects the emergence of innovation within complex systems, i.e., resulting in an IPE perspective on the Triple Helix, entrepreneurial ecosystems, or TIS literature. Next to studying the benefits of open knowledge flows and risks of closing off, it would also be interesting to think more about the geoeconomics and economic statecraft aspect of innovation policies. Following Van Apeldoorn and De Graaff (2022) in the IPE field, this could include studies on, for example, the intended or unintended foreign effects of domestic innovation policies.

Table 1. Overview of integration vs. closing-off dilemma for governments in times of global technology-based competition (based on Tan et al. 2025)

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	Integration	Closing off
Benefits	Engaging with cutting-edge knowledge and technology to stay ahead of geopolitical competition and address societal challenges.	Maintaining agency and autonomy over one’s innovation system.
Risks	Becoming overly dependent on knowledge and technology from potentially adverse states, risking being cut off (i.e., weaponization).	Limited cross-border knowledge flows and interactive learning result in limited innovation to stay ahead of geopolitical competition and address societal challenges.

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