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Article

# The European Union, the United States, and Trade: Metaphorical Climate Change, Not Bad Weather

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## Abstract

US and EU trade relations exhibit a set of chronic and secularly unsustainable imbalances, in which new Schumpeterian leading sectors and catch-up growth create growing tension in the asymmetrical and somewhat hierarchical US–EU relationship. These imbalances exhibit two distinct cycles interrupted by a clear structural break in the 1970s and an emerging cycle after the 2008–2010 crises. Each cycle has seen rising US current account or trade deficits with Europe provoke some financial or political crisis. Each crisis produced a US-led solution producing even greater imbalances in the next cycle, with concomitant stress on the asymmetric US–EU relationship. The EU and particularly the northern eurozone economies typically have relied on export surpluses for growth. But relying on export surpluses for growth reinforces EU dependence on the US and the US dollar at a time when US domestic politics are increasingly hostile to trade deficits and tension with China is rising.

## Keywords

European Union; institutions; power; Schumpeter; technology; trade

## Issue

This article is part of the issue “Out With the Old, In With the New? Explaining Changing EU–US Relations,” edited by Marianne Riddervold (Inland Norway University / University of California – Berkeley) and Akasemi Newsome (University of California – Berkeley / Inland Norway University).

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## 1. Introduction

US and EU trade relations historically have been a short-run stable but long-run unstable set of imbalances, in which the asymmetrical, somewhat hierarchical structure of the US–EU relationship mixes with secular trends to produce cycles marked by growing tensions and periodic reconfiguration of the institutional structure regulating trade. Put simply, US elites and many firms sit at the center of an empire-like, but decaying, global structure of power. A mixture of institutionalized cooperation with some European (and Asian) elites and with their militaries sustains this imperial structure. All empires extract resources from their peripheries and all successful empires balance extraction with the institutionalized provision of order and the transmission of production and cultural technologies.

But balancing creates a dilemma. Order, stability, and transmission enable peripheries to catch up with the cen-

ter in economic and, potentially, military terms (Gilpin, 1981; Mann, 1986). While catch-up increases the volume of resources the center can harvest from the periphery, it also potentially creates peer rivals. Imperial elites thus must periodically “de-mature” or reconfigure economic and military power to restore the asymmetries that enabled them to create the empire in the first place. “Must,” however, implies neither “will” nor “will successfully.” Here the critical issue is which firms and whose firms successfully capture the enhanced profits associated with the emergence and monopolization of new Schumpeterian leading sectors after 1800, and whether a domestic political base supports a given global order. Thus, geopolitical and domestic political realities highly constrain state agency.

This article thus surveys the Braudelian *longue duree* rather than the “*histoire evenementielle*” of the US–EU trade relationship, complementing Hjertaker and Tranøy (2022) on the financial linkages and Kerremans (2022)

on the narrower World Trade Organization (WTO) institutional structure. It does so to trace structural economic changes occurring “behind the backs of actors”—Max Weber’s *Auslese* (Breiner, 2004)—as these strongly condition the choice of options available to actors in the struggle for dominance of social arenas in general and, given the focus of this article, markets in particular. Thus, like Smith (2022), the article addresses the structural changes in the global economy conditioning the US–EU trade relationship over the post-war period, rather than looking at “operational” issues over a narrower time frame, such as the workings of preferential trade agreements, the chronology of specific decisions, or specific presidents.

The value added here is identifying the longer-term trends generating broad constraints on national political actors—climate change around trade—so as to avoid too much emphasis on idiosyncratic decisions attached to particular political personalities—the weather. As such, explicit discussions of agency largely drop out for reasons of parsimony. The article thus provides one concrete dimension of the more general framework presented by Smith (2022). In particular, where the data are available, the article focuses on two key bases for economic power: looking backwards, the distribution of global profit in the past 16 years, and, looking forward, the distribution of R&D efforts about present and emerging industries.

Section 2 elaborates the analytic frame. Sections 3 and 4 respectively explore EU–US relations in the automobile and petroleum/Bretton Woods 1 era, roughly 1950 to 1980, and then the information and communication technologies (ICT)/Bretton Woods 2 era, roughly 1980 to 2010. Section 5 discusses the state of play after the 2008–2010 financial crises, focusing on R&D. Section 6 concludes, with particular attention to the questions raised in the thematic issue introduction.

## 2. The Big Picture

The emergence and maturing of Schumpeterian “leading sectors” drive stability and change in US–EU trade relations over the past 100 years. Schumpeter (1934, 1939) argued that disequilibrium, or punctuated equilibria, rather than a continuous marginalist-style equilibrium, characterized capitalist economies from the early 1800s forward. Great spurts of investment in and development of new products, production processes, energy sources, transportation networks, and corporate forms generated eras of rapid growth. When those new leading sectors matured, eras of relatively slow growth and incremental change emerged. Thus the fourth, automobile and petroleum wave involved the build-out of continuous-flow mass production assembly lines managed by vertically integrated corporations, oil transportation networks and refining systems, roads, and sophisticated logistics systems for moving inputs to factories and product to consumers (Perez, 2010). These leading sectors were interlocked, requiring large complementary investments.

Neither Schumpeter (1950) nor neo-Schumpeterians (Perez, 2010) assumed that growth cycles recurred automatically. Here agency partially enters the story, insofar as geopolitical concerns after 1900 motivated intensive state efforts to promote new technologies and assure a solid commercial base using those technologies. But the imperative to survive highly constrains this agency, as the vast classical realist and neo-realist international relations literature attests. Thus all major powers promoted their motor vehicle industry (Bardou et al., 1982) and even more so aircraft manufacturing (Edgerton, 2005; Trimble, 1986) after World War 1, spurring generalization of mass production techniques. Similarly, national security concerns motivated the US government to fund the R&D and product roll-out generating the vast majority of technologies at the heart of the ICT growth wave (Block & Keller, 2015; Flamm, 1988; Fong, 2000; Weiss, 2014).

A Schumpeterian framework helps surface profits and growth as important sources of global power and thus motivators for state policy. As Bessembinder et al. (2020; Bessembinder, 2018) show, only a handful of firms—a mere 811 firms out of 62,000 listed firms globally from 1990 to 2020—generate significant excess returns above their cost of capital rather permissively measured as the return on a one-month US Treasury bill. Those profits are a significant part of geopolitical power, by partially determining whose economy will grow and whose firms will have the ability to take control of other firms. Most of the firms generating excess returns are the core firms from prior or current Schumpeterian growth waves: Toyota, Exxon, Apple, Merck (US), SAP, Siemens, or Novo Nordisk. Overall, US-headquartered firms accounted for 64% of net excess returns, 1990 to 2020, and it is likely that this share holds true over most of the post-war era (Bessembinder et al., 2020, pp. 49–52).

US innovation of and initial dominance in the production and social technologies of Schumpeter’s petroleum and internal combustion engine fourth wave enabled US global dominance after the 1940s. European catch-up in the production of the “dumb machines” of the fourth wave, and Asian catch-up in production of the low-value consumer goods of the first (textiles) and second (basic metals) waves motivated the first clear structural break with post-war institutions in the 1970s. In the 1980s, the US redefined the global trading and production systems to favor the fifth Schumpeterian ICT plus pharmaceuticals/biotechnology cluster and increased US state support for those technologies. Chinese catch-up in fifth wave ICT and European outright dominance in fourth wave goods led to a second structural break in the 2010s. In different ways, the Trump and Biden administrations represent efforts to construct some stable world order in which US firms dominate fifth wave goods and the emerging sixth wave based on artificial intelligence, genomics, and renewable energy.

This cyclical pattern of order, catch-up, and reconfiguration is secularly unsustainable. First, in each cycle

rising US current account or trade deficits with Europe led to a financial or exchange rate or political crisis—often different aspects of the same problem. Each crisis produced a US-imposed or US-led solution leading to even greater imbalances in the next cycle. Sustained US current account deficits do transfer real resources to the US, but those manufactured goods imports also imply a profound hollowing out of the US economy and the political bases of support for an open trade regime; *vide* the populist surge that produced the Trump administration. And in each cycle the scale of the US current account deficit relative to US gross domestic product (GDP) has increased, leading to a cumulative increase in US net foreign debt relative to GDP and thus perhaps doubts about the durability of the US dollar. These undercut the US commitment to and other countries' adherence to the current trade regime.

Second, the political economy of the EU and especially the eurozone tends towards domestic economic stagnation and thus a structural reliance on current account surpluses for their margin of growth. Successful late development in northern Europe in the 19th century and after each World War produced a set of largely demand-deficient political economies that depended on external demand, mostly from the US, for their margin of growth. In the language of *Varieties of Capitalism* (Hall & Soskice, 2001) the EU's core economies are largely coordinated market economies (CMEs) characterized by sector or national level wage bargaining that tends to depress wage growth and wage levels relative to GDP as compared with the liberal market economies (LMEs) characterized by uncoordinated bargaining and significant wage dispersion. This literature tends to focus on wage compression as the outcome of bargaining in CMEs, but Baccaro and Pontusson (2016; see also Dao, 2020; Manger & Sattler, 2020) argue that wage and thus demand repression characterize many export surplus CMEs. The data also support repression. Private household consumption in the export surplus CMEs (Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Sweden, but excluding oil-exporter Norway) was a weighted average of 52.7% of GDP from 1995 to 2019, versus 64.9% for the major current account deficit LMEs (Australia, UK, Canada, New Zealand, and the US); total consumption (private plus government) shows a smaller but still significant 7.1% of GDP difference (European Union, 2021a). Depressed demand typically produces slower growth despite the contribution of export surpluses: Real per capita income in standard international dollars in these CMEs grew by a weighted average of roughly \$14,066 from 1995 to 2019, versus \$18,455 in these LMEs (International Monetary Fund, 2021).

Baccini et al. (2021), who compared current account outcomes by looking at tariff levels and manufacturing employment in European CMEs and LMEs, imply that chronic US current account deficits stem from *Varieties*-style wage bargaining differences. But wage coordina-

tion and union density has been declining secularly in CMEs (Baccaro & Howell, 2017) even as surpluses have grown, as manufacturing shrank as a share of GDP everywhere, and as tariffs became largely irrelevant to the industries at the heart of the ICT growth wave.

Third, EU and eurozone current account surpluses imply the accumulation of dollar-based assets, locking EU financial systems to use of the US dollar (Beck, 2021; Schwartz, 2019). Any significant decline in US growth and thus the centrality or value of the US dollar threatens decades of accumulated European wealth and profits. Simultaneously, any reduction of US current account deficits would decrease EU and even more so eurozone growth. Like St Augustine, eurozone states prefer endogenously driven growth, "but not yet...," even as their surpluses weaken US export capacity.

Finally, US firms will not necessarily dominate sixth wave industries. China's state has devoted enormous resources to catching up in sixth wave technologies, particularly artificial intelligence and the manufacturing side of renewable energy (Allen, 2019; Jaffe, 2018; Rikap & Lundvall, 2021). European states and firms are similarly trying to catch up in fifth wave and leap to sixth wave sectors through efforts like Germany's *Industrie 4.0*. Catch-up implies even larger US current account deficits, a larger net foreign debt relative to GDP and thus diminished room for the US state to shape the global trade environment through market access and political pressure.

This gradual decay of US hegemony (Reich & Lebow, 2014), or, more narrowly, of the US-orchestrated global trading regime, thus presents a profound problem for the EU—and even more so the eurozone—as a status quo-oriented power relying on trade surpluses for growth. The EU confronts climate change rather than temporary bad weather in the global trade regime. And despite Brexit, the EU is more fragmented than ever, hindering a coherent response to this economic climate change.

The transition from the nearly mature ICT growth cluster towards an industrial base combining the fifth and the emergent sixth Schumpeterian growth cluster based on artificial intelligence, genomics, and renewables will potentially shift the locus of power to whichever political systems can define the global rules for intellectual property rights (IPRs) and the finance sector. These issues were at the heart of the now-defunct Trans-Pacific Partnership (TPP) and Transatlantic Trade and Investment Partnership (TTIP) negotiations. Power in the fourth growth cluster rested more on actual control over physical capital and tacit knowledge than on rules and IPRs (Perez, 2010; Schwartz, 2016). But value and profit increasingly accrue to firms that control robust IPRs rather than firms that understand manufacturing processes and design for manufacture (Schwartz, 2020). Relatively speaking, more US and Asian than EU firms are in the former category. The US and China are currently struggling to assert control over the production of IPRs and related standards, with the EU largely reduced to a

rule-taker rather than a rule-maker except in the area of anti-trust. Europe's choice is increasingly between remaining a junior partner in a US-structured global division of labor or having its major industries displaced by aggressive Chinese industrial policy.

This choice is nothing new in US–EU trade relations. After 1945 Europe largely acquiesced in a US-led global division of labor in which the European Economic Community (EEC) and then the EU in the aggregate produced goods from an earlier round of Schumpeterian growth, while the US introduced goods and services from the new cluster of leading sectors, as the profit data below will show. That said, the EU has struggled against this division of labor and its associated vulnerabilities using offensive state industrial policies targeting the various new leading sectors, and the defensive deployment of aggressive anti-trust policy.

### 3. Bretton Woods 1, 1950–1980

During the first Bretton Woods era, roughly 1950 to 1980, US–EU relations were in the southeast quadrant of Riddervold and Newsome's (2022) schema—a unified EU confronted a hegemonic US. The emergent EEC faced a complex dilemma: reconciling its security dependence on the US and the need to earn US dollars to pay for food and energy imports with the desire to catch up in terms of productivity and export competence (Strange, 1971).

This dual dependence made it difficult for EEC members to block the return or arrival of US multinational corporations (MNCs). Although the General Agreement on Tariffs and Trade (GATT) gradually lowered tariff barriers, impatient US MNCs jumped over the significant tariff and currency control barriers of the 1950s (Baldwin, 1984, p. 6; Bown & Irwin, 2015) to produce directly inside the EEC, often with US government pressure (Gowa, 1985). Generally, this took the form of self-contained national production systems—they thus were multi- rather than transnational or global firms. US MNCs' productivity advantages gave them dominant or significant positions in the major sectors of the fourth growth wave, like automobiles, aircraft engines, or petrochemicals, as well as the major sectors of the nascent fifth, or ICT revolution (Wilkins, 1974). US firms in Europe constituted a near-extraterritorial economy, producing 80% of Western Europe's computers, 24% of its motor vehicles, 15% of its synthetic rubber, and 10% of its petrochemicals in the 1960s (Servan-Schreiber, 1969, pp. 14–15). This production displaced direct US exports to Europe.

European states were not passive in the face of the threat that US firms might lock European firms into older, less dynamic sectors. Almost every European country tried to expand indigenous automobile production (Van der Pijl, 1986; Zeitlin & Herrigel, 2000). UK aside, local firms in the major EEC economies kept control over their automobile markets and eventually became successful exporters (Reich, 1989). By 1980, US MNC auto firms accounted for only 20 to 25% of sales in EEC

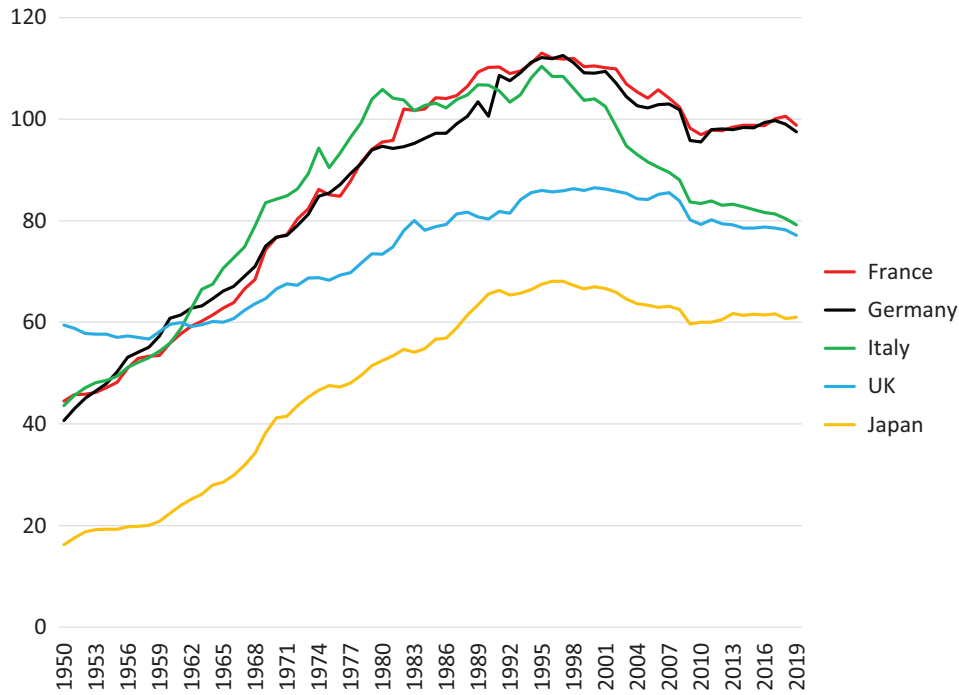
markets and a few European producers had established reputations as producers of high-quality vehicles. Still, Germany aside, European producers lagged in productivity terms (Altschuler et al., 1984). European states had similar mixed success defending the high-tech sector of the fourth industrial revolution, civil aircraft production. Aircraft production is even more sensitive to economies of scale than automobile production, so European states consolidated their fragmented producers into Airbus in 1970. But Airbus did not generate significant net exports or import displacement until the 1990s.

Meanwhile, efforts by states and the EEC to generate a robust set of firms in fifth wave core ICT sectors largely failed in the absence of the focused approach to technology development characterizing US government and particularly defense/space contracting (Flamm, 1988; Sandholtz, 1992). Pan-EEC research projects for semiconductors, computing, and telecommunications in the 1980s created only a handful of marginally competitive firms (Duchene & Shepherd, 1987; Sandholtz, 1992, pp. 113–124). That said, a few specialist firms did succeed, like the Nordic telephony giants, the Dutch ASML (semiconductor production equipment), or STMicroelectronics and Infineon (mostly automotive semiconductors). By 2020 EU semiconductor firms had a global market share of 10%, versus US-based firms' 47% share or Korean firms' 20% share; US firms captured 50% of the EU semiconductor market by value (Semiconductor Industry Association, 2021, pp. 3, 5).

### 4. The Breakdown of Bretton Woods 1 and the Shift to Bretton Woods 2

In this first trade cycle, trade largely occurred along intra-industry lines, exchanging differentiated commodities inside the same industrial sector. Thus, Germany and Italy might exchange Volkswagen Beetles and Fiat 124s. Intra-industry trade enabled local firms to capture whatever value was created in commodity chains that largely were confined within national boundaries. Meanwhile, US firms were shifting from multi- to transnational production, further eroding US exports as low-value manufacturing operations shifted offshore to low-wage zones (Durand & Milberg, 2019). This combined with the rising competence of EEC firms in fourth Schumpeterian wave goods to motivate the US state to change the Bretton Woods 1 regime. Put simply, fixed European exchange rates against the US dollar combined with steady productivity growth above the American rate (Figure 1) to shift relative unit labor costs in favor of European exporters. European currencies were somewhat overvalued at the beginning of the 1950s, but by the 1960s they had become undervalued against the dollar and US inflation was above continental (though not British) levels.

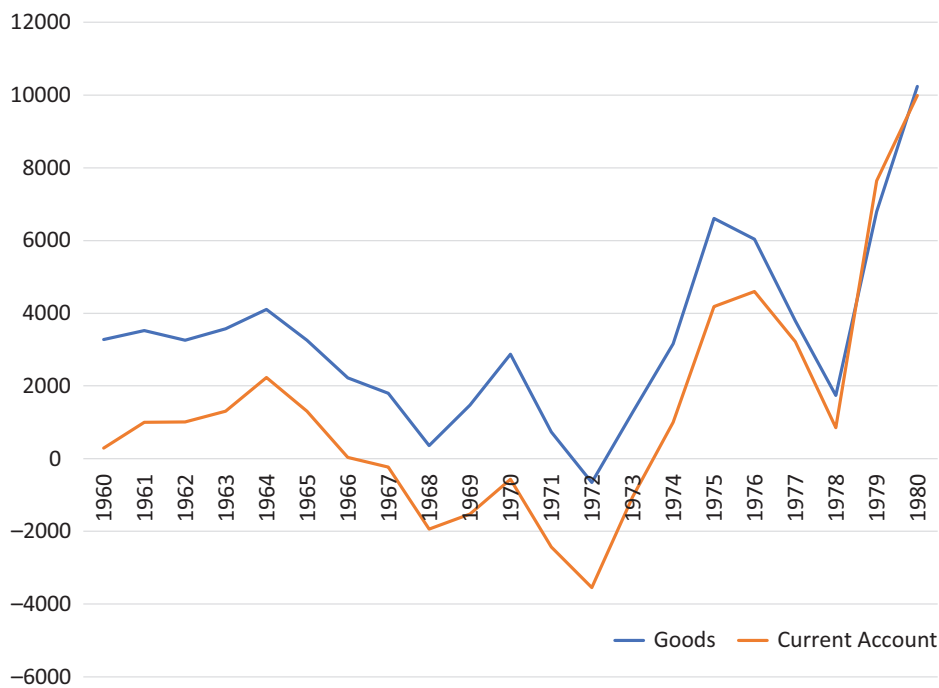
European (and Japanese) catch-up and the looming arrival of US trade (not just current account) deficits provoked the US state to change the rules of the game, making Europe's position as a rule-taker rather than a



**Figure 1.** Relative productivity: output per hour as % of US (i.e., US = 100 for all years), 1950–2019. Source: Calculated from Conference Board (2020).

rule-maker painfully clear. Facing German reluctance to revalue the DMark, the US re-wrote the rules of the international monetary system to grossly and subtly shift the rules of the trading system in favor of US firms. The “Nixon shock”—a 10% dollar devaluation and 10% tariff increase—temporarily created a significant US surplus with Western Europe (Figure 2).

The “Nixon Shock” and the end of the Bretton Woods currency regime tend to get the most academic attention, but this obscures three equally significant changes in the interregnum between the first and second cycles. First, Europe’s great productivity catch-up largely ended by the 1980s as output plateaued for fourth wave goods. Second, related, Western European growth rates slowed



**Figure 2.** US current account balance with Western Europe, millions of 1970 US\$, 1960–1980. Source: Calculated from US Bureau of Economic Analysis (2022).

significantly. Slower productivity and population growth in what became the EU12 reversed the productivity and growth relationship between the US and EU12 (Figure 1). The US began outgrowing the EU12 in the 1980s, despite a worsening current account, as its ICT and pharmaceutical sectors began an era of rapid growth.

Third, the US government tried to use the 1973 Tokyo GATT round to subtly shift trade regulation away from tariffs and towards issues like IPRs that favor emerging US competencies in fifth wave ICT goods and services, significantly expanding the GATT's remit. The Tokyo round brought dairy and meat products into the GATT. Second, it implicitly brought some public procurement into the GATT by incorporating trade in civil aircraft—almost all European airlines were state-owned. Third, it put non-tariff barriers onto the table. Finally, in a critical change, and building on the 1970 Patent Cooperation Treaty ratified in 1975, the US opened up the issue of IPRs, hoping to export the US legal regime around IPRs to the rest of the world (Drahos & Braithwaite, 2017, p. 86, 109; Hurt, 2015).

While that last ambition lay barren at Tokyo, it became a central feature of the 1986 Uruguay round establishing the WTO (Sell, 2003). By that time, US domestic IPR law had undergone significant changes favoring firms possessing potential intellectual property (IP). For example, US judicial decisions and legislation permitted patenting of novel biological entities in 1979 and copyrighting of software in 1980. The WTO's Trade-Related Aspects of Intellectual Property Rights agreement would generalize some of this to the international trade regime, just as the US economy entered the fifth Schumpeterian boom. Europe's own IPR-oriented ICT and pharmaceutical firms constituted an intra-EU lobby supporting these US initiatives at the Uruguay round (Osgood & Feng, 2018; Sell, 2003).

By 2010, transnational corporations (TNCs) accounted for 80% of gross global trade, with 46% of that trade occurring as administered trade inside TNCs and their tied subcontractors, and an additional 33% as arm's length purchases (United Nations Conference on Trade and Development, 2013, p. 135). This displacement of intra-industry trade by a complex global division of labor reflected the relative success of the EU and its member states in safeguarding their firms. Where US firms had multinationalized into the EU in the Bretton Woods 1 era, EU firms now returned the favor by establishing production facilities in the US during Bretton Woods 2.

But in another sense, much European foreign direct investment into the US or North American market simply consolidated continental EU firms' grip on older leading sectors confronting slower growth, weaker profits, and the threat of disruptive technological change. By the time German automakers established a US production presence, the value added in vehicle production had already begun to shift away from assembly and to a lesser extent design towards electronics and software. By 2017, roughly 40% of the value in a vehicle came from

electronics and software (Deloitte, 2019, p. 12). EU domiciled firms like NXP, STM, and Bosch retained a considerable share of this value added, at 31.6% of the world market for automotive semiconductors in 2021, though somewhat below the EU's 40% share of automobile sales by value (Infineon, 2021, p. 21). But EU chip firms' concentration on internal combustion engine control modules left them vulnerable to the electrification of engines that the sixth Schumpeterian wave portends.

Meanwhile, the US state helped shift the US economy towards ICT and other information-based industries in the face of rising EU and Japanese competitiveness in fourth wave goods (Block & Keller, 2015; Weiss, 2014). The US state channeled significant R&D funding into ICT and bioengineering, created a legal framework enabling profitability for those industries, and deepened integration with Asian economies capable of supplying cheap labor for US TNCs. US firms and the US economy achieved broad gains through an ICT-driven transformation of many service sectors. In the service sectors that matter most to business—telecommunications, transport, power generation, and retail distribution—US productivity advantages over Japan and Germany were already considerable, and ICT linked all parts of the supply chain on a real-time basis to facilitate the reduction of waste and reduce inventory costs. Total non-farm US productivity grew about 3% per year during 1995–2004, versus 1.5% in the EU. US productivity gains occurred disproportionately in the service sectors, at nearly six times the rate in the EU (van Ark et al., 2008, p. 38).

Some EU firms benefited from the changing global trade regime and the continued integration of the EU into what was becoming a more hierarchical global economy. Service sector and ICT firms like Deutsche Telekom, SAP, and DHL, as well as the transnational automobile firms mentioned above, aggressively expanded in the new environment, and supported the WTO's stronger protections for IPRs (Drahos & Braithwaite, 2017; Osgood & Feng, 2018). Novartis makes roughly 40% of its revenue in the US market; about half of Philips' medical imaging sales by value are in North America. But overall, the shift towards global commodity chains and vertically disintegrated firms largely benefitted US firms with robust IPR portfolios.

Vertical disintegration and supply chain globalization shifted the industrial structure away from the "Fordist" duality of large, integrated industrial and service firms and small, lower profit ancillary firms towards a new economy industrial organization with, in ideal typical terms, three layers of firms (Durand & Milberg, 2019; Rikap & Lundvall, 2021; Schwartz, 2020). This change in corporate strategy and structure concentrated profits into a set of relatively small, human capital-intensive firms whose profit strategy involves capturing value via monopolies based on control over IPRs. Their robust IP portfolios prevent or discourage competitive entry, generating large profit volumes. A second set of firms seeks profit through control over physical capital-intensive

assets and/or the possession of tacit knowledge (as with the German *mittelstand*). Investment barriers to entry, significant tacit production knowledge, and horizontal concentration through merger enables them to capture modest profits volumes. The semiconductor industry exemplifies high barriers to entry: \$10 to \$15 billion for a state of the art (below 3-nanometer) semiconductor fabrication plant that might be obsolete in a handful of years. Finally, a third set of firms employs vast swathes of the labor force to provide low-wage, low-skill, labor-intensive manufacturing and service production with few barriers to entry. While their profit *rate* might be high—they are highly exploitative—their profit *volume* generally is low.

US firms largely dominate this global division of labor, with mostly Western European firms (and Japanese, Korean, and Taiwanese firms) in the middle layer, and low-wage Asian firms (and domestic labor suppliers like Randstad or Hartz 4 workers) in the bottom layer. Think Apple—STMicroelectronics—Foxconn. But equally so, the large mass of franchise businesses based on brand also have this same structure of IPR firms, physical capital owners, and labor suppliers: brand owners like Accor, Hilton, or Marriott, that own few buildings—Real Estate Investment Trusts that own most buildings—labor suppliers like Hospitality Staffing Solutions or Adecco. Obviously, hybrid firms that do not perfectly fit these ideal types also exist, like Intel (blending patented/copyrighted designs and software with capital-intensive production of chips), or Bosch (design and software embedded in physical electronics or power generation equipment). Equally so, some European firms sit at the top of complex global value chains. IKEA, for example, is structured as pure IP holders (the Interogo Foundation and Inter IKEA Holdings) that license that IP to the actual stores (which are set up as independent firms) and stock those stores with furniture whose parts are made by firms employing low-wage workers in, among other places, rural America.

The disproportionate representation of American firms in the IPR layer means that US firms capture a disproportionate share of the profits of large global firms, which in turn capture a large share of all global profits (as far as this can be measured; see Table 1). American firms captured over a third of the cumulative profits of the 4,157 firms ever appearing on the *Forbes* Global 2000 annual list of the largest global firms from 2006 to 2021 (i.e., for corporate fiscal years 2005 to 2020; Murphy et al., 2021). This substantially exceeds the US share of global GDP at nominal exchange rates. The EU as a whole meanwhile performed under par, and the eurozone even more so, reflecting the absence of the UK, Sweden, and Denmark. Table 1 shows the aggregate effects of the concentrated excess returns Bessembinder et al. (2020) document.

Britain, France, Sweden, and Denmark all have major firms in the ICT, software, and pharmaceutical sectors and above par shares of profits. But overall, the EU lags in the shift away from fourth (automobiles and oil) generation to fifth (ICT and IPR) and sixth (artificial intelligence, genomics, but less so renewable energy) generation goods. EU firms—particularly German ones—largely dominate sectors with limited growth potential, like non-commodity chemicals and automobile assembly and parts. Data on the 20,000 largest consolidated firms in the Bureau van Dijk Orbis database, 2010 to 2018, show that 92 IPR-based firms in the top 500 firms by cumulative profit captured 15.6% of all pre-tax profits for those 20,000 firms. US firms in that group of 92 captured 67.9% of the 15.6%. By contrast, German and Japanese firms captured 62% of the 3.8% of cumulative profit accruing to the 29 automobile firms in the top 500 (Schwartz, 2021, p. 21).

Profits enable R&D for future growth. As in Bretton Woods 1, the EU, its member states, and European firms have tried to increase EU firms' presence and competitiveness in fifth and sixth wave sectors. But the political

**Table 1.** Share of cumulative profits for 4,158 firms in the *Forbes* Global 2000 from 2006 to 2020 and share of global GDP, 2019 by country/region.

Firm HQ	1: Profit share (%)	2: GDP share (%)	Ratio 1::2
USA	34.4%	24.2%	1.42
EU	20.0%	21.9%	0.91
of which:			
Eurozone	13.2%	16.1%	0.82
France	3.6%	3.3%	1.09
Germany	3.4%	4.7%	0.72
Italy	1.1%	2.4%	0.43
for reference:			
UK	4.8%	3.3%	1.44
China + Hong Kong	14.5%	16.2%	0.90
Japan	6.9%	5.9%	1.17
Korea + Taiwan	3.7%	2.6%	1.43

Source: author calculation from *Forbes* (2021) and International Monetary Fund (2021).



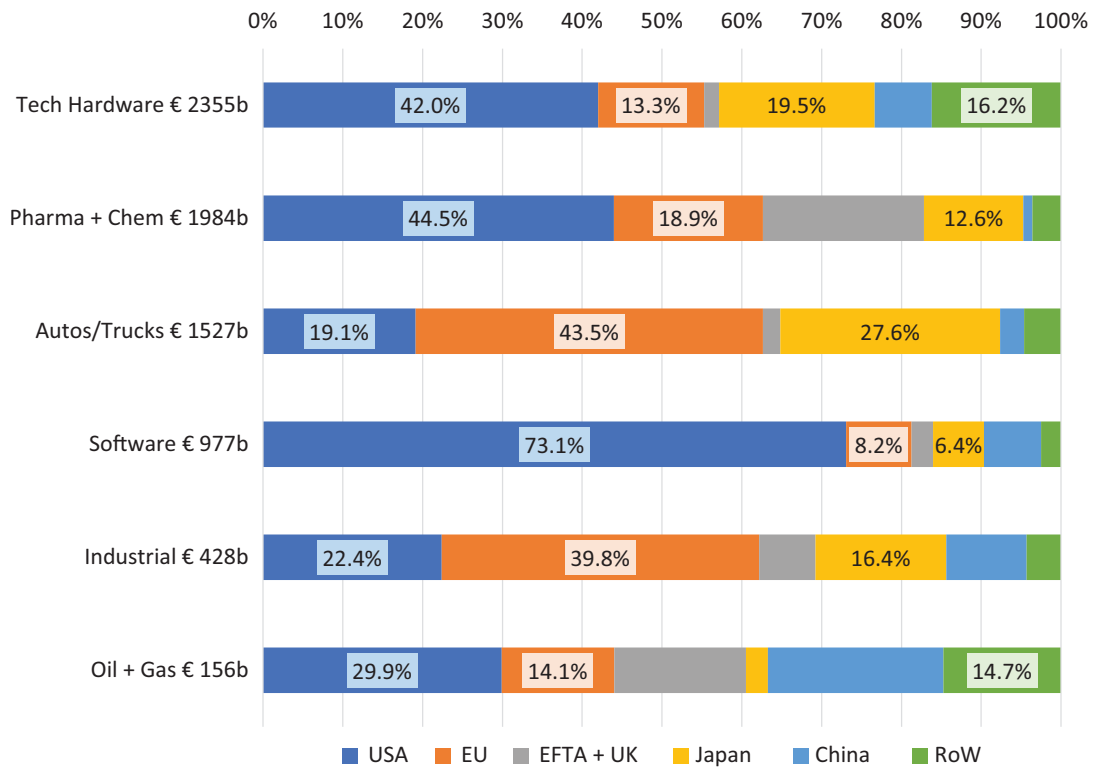
and economic salience of fourth wave firms in Germany and to a lesser extent France means that the bulk of European R&D spending tends to go to older sectors like vehicles, oil, and gas (largely on account of France and the UK; see Figure 3). Likewise, the EU’s health care equipment presence largely rests on two firms, Siemens and Philips.

By contrast, US firms clearly dominate R&D in the fifth Schumpeterian wave software and technology hardware sectors. US pharmaceutical firms accounted for nearly half of cumulative pharmaceutical R&D spending from 2003 to 2019, and two non-member states—UK and Switzerland—account for an additional 22% (European Union, 2021b). More narrowly, the bulk of sixth wave biotechnology R&D occurs in the US; US firms accounted for 84% of cumulative R&D and 76% of capital expenditure for this sub-sector. While US pharmaceutical firms do contract out R&D to European firms, as with the famous Pfizer-BioNtech Covid19 vaccine, the reverse is also true and favors US institutions. Bibliometric data show that the top 10 US pharmaceutical firms by publication count conduct 80% of their research in the US and 17% in Europe, versus 66% in Europe and 30% in the US for the top 10 European firms (Tijssen, 2009, pp. 867, 870–872).

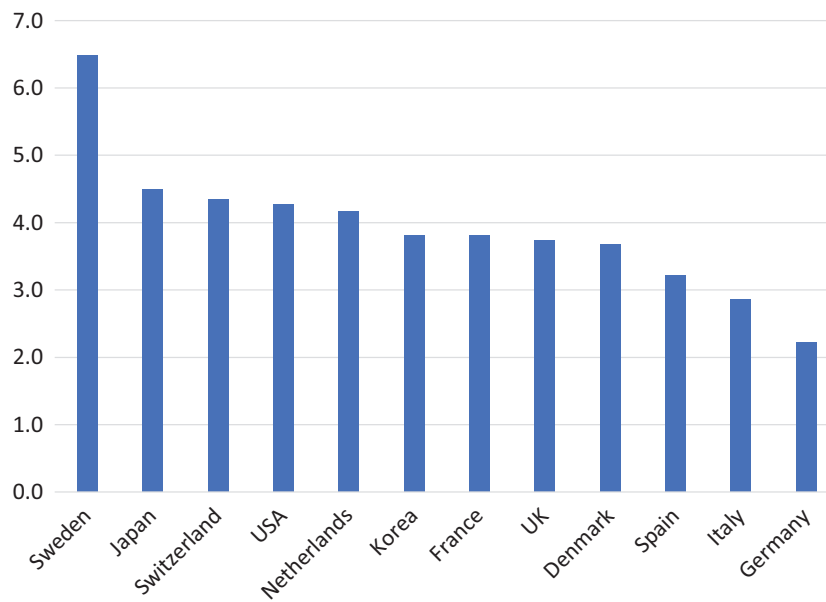
Overall EU firms’ total R&D expenditures lag. Cumulative R&D spending by all EU firms (net of the UK) in the 5,303 highest R&D spending firms from 2003 through 2019 amounted to €2.1 trillion, as compared to

€3.4 trillion for the US or €1.5 trillion for Japan (European Union, 2021b). Adding UK, Switzerland, and Norway brings the EU total to €2.8 trillion, or 84% of the US total. EU output of high-technology manufactured value-added also has substantially lagged US and Asian output since the mid-1990s. The EU’s share of global high-tech value-added fell from 28% in 1990 to 18.4% in 2003. The differences in profitability and the significance of IPRs can also be seen in the relative share of ICT capital compensation in GDP (Figure 4). The relatively low share in Germany and Italy confirms the point made above, namely that the bigger EU economies are overly oriented towards sectors with limited growth potential, even if considerable tacit production knowledge protects their market share.

EU growth is thus hostage to debt-financed growth and import consumption in the US and UK. The EU surplus economies in effect offer vendor credit to these economies, accepting dollar- (and to a lesser extent pound sterling) denominated debt instruments and real estate in return. From 1992 to 2018 the US ran a cumulative current account deficit of \$10.6 trillion or roughly 60% of 2018 US GDP. This amounted to about 0.8% of global GDP annually and half of cumulative global current account deficits over that period. On the other side, the countries that eventually comprised the eurozone ran a \$1.8 trillion current account surplus. Not all of that was with the US, but clearly, a world without the US deficit would have found it difficult to accommodate



**Figure 3.** Country shares of cumulative R&D spending by 5,303 highest spending firms, 2003–2019, disaggregated by sector. Notes: Tech Hardware = Semiconductors, computer equipment, telecommunications equipment, health care equipment, electronics; Industrial = residual manufacturing sectors. Source: Author calculation from European Union (2021b).



**Figure 4.** Share of ICT capital compensation in GDP, average 2001–2019, %. Source: Author calculation from Conference Board (2020).

the eurozone surplus, especially given the EU’s deficit with China.

To sum up, during Bretton Woods 2 the relationship between US and EU GDP and productivity growth rates reversed, with the US consistently outgrowing the core EU economies as fifth wave leading sectors emerged in the US. The structure of trade shifted from intra-industry trade flows to a continental- and global-scale division of labor as the industrial structure shifted from vertically integrated to disintegrated firms. US firms dominated this new industrial structure with respect to much of high tech and, via IPRs, much of the profit generated by these global chains.

Yet as in Bretton Woods 1, endogenous dynamics brought this era to an end. Low-wage Chinese exports and the eastward migration of the German automobile supply chain undermined wages and financial security at the bottom and middle of the labor market in the US and EU (Emmenegger et al., 2012). In Germany, the bottom three deciles of workers by income saw declining real wages from 1995 to 2017 (Dao, 2020; Goldschmidt & Schmieder, 2017). Increased household borrowing mitigated rising insecurity and housing prices until the financial crises of 2008–2011.

As in the 1970s, crisis provoked changes in the global trading regime and parallel shifts in global finance. These left the EU in a precarious position. Growth increasingly relied on external demand after the euro crisis, but continued access to the EU’s two major export markets came into question. The Trump administration unilaterally imposed or threatened tariff increases, which, as of early 2022, the Biden administration largely retained. China’s stimulus packages—critical for German export success—began yielding less and less in the way of growth, with China’s official annual GDP growth rate

declining by 40% after 2010. Finally political instability emerged everywhere: Brexit, US–Chinese trade and security tensions, US electoral turmoil, populist electoral surges in the EU, and, of course, Covid-19.

### 5. A Second Interregnum?

Unlike the 1970s transition, the shape of the current transition remains unclear. The sunk cost of global commodity chains and existing treaties build in considerable inertia, as manufacturing and even many services cannot be redeployed instantaneously, least of all between the highly integrated Atlantic economies. Still, four things are reasonably clear.

First, US-based ICT and bio-pharma firms, along with other IPR-based firms, are likely to continue capturing a disproportionate share of global profits. This validates the dollar-denominated assets export surplus economies accrued over the past three decades. By stabilizing the US dollar’s centrality these profits enable the EU’s CMEs to continue to run export surpluses, yet simultaneously erode the US manufacturing base, weakening the dollar’s credibility. Going forward, much depends on whose firms dominate sixth wave leading sectors and the dollar’s credibility.

Second, global trade growth is slowing. Global trade growth slowed from its 6.4% annual average increase, 1991–2007, to only 2.4%, 2013–2019 (World Trade Organization, 2021). EU GDP growth depends considerably on running a current account surplus. Exports of manufactured goods make up a much larger share of EU than of US GDP at 12.3% versus 8.1%. The EU manufactured goods surplus and the US deficit are symmetrical at roughly 4% of GDP. This European strength is also a massive vulnerability, reflecting Germany’s deep

specialization in automobiles. Yet the critical automobile sector is clearly dematuring. As electric vehicles replace internal combustion engine ones, new competitors—particularly Chinese firms enjoying huge subsidies—are emerging, and value may shift towards US strengths in software and autonomous driving. More generally, one-fourth of firms surveyed by McKinsey were re-localizing supply chains in 2018, well before Covid-19 (McKinsey Global Institute, 2019, p. 10).

Third, domestic and global politics threaten Atlantic amity. The EU's €400 billion annual current account surpluses have already provoked a trade backlash from the US that has outlived the Trump administration (and extends beyond Europe). Suppressed domestic demand in the EU also may have a limited political shelf life. The US and EU lack the security conflicts characterizing the US–China relationship, but economic relations are increasingly hostage to diverging security policy preferences over Russian natural gas and Chinese telecommunications equipment. Core organized interests in the EU—read German manufacturers—are reluctant to endanger continued sales to China by supporting US security initiatives against China.

Finally, China and Russia have much to gain politically from a deteriorating EU–US trade relationship. China and to a lesser extent Russia are trying to change global institutions to reduce US power and delink the EU from the US (Johnston, 2019). Thus, China's Belt and Road Initiative is an effort to tie together a continental Eurasian market, especially around energy supply (Umbach, 2019). Similarly, Chinese proposals to replace the dollar with some denationalized global currency directly attack the benefits the US gains from dollar centrality (Eichengreen & Xia, 2019).

## 6. What Now?

What do the issues raised above say about the theories of international relations raised in the introduction? The EU still finds itself in a trade world structured by institutions largely reflecting US interests, in a dollarized global monetary system, and in which northern Europe needs trade surpluses to attain even modest growth rates. Internal political divisions and an ongoing slow-motion banking crisis characterized by very low profitability and return on equity after 2010 (Enria, 2021; KPMG, 2021) hamper EU efforts to re-write the rules of the international system.

For realist scholars, security threats from Russia and economic threats from China should motivate the EU to line up with the US. But the EU's most successful and productive economy needs Russian inputs and Chinese and American markets for growth and profits. These unit-level considerations dampen system level signals about the changing balance of power.

For institutionalist scholars, EU paralysis while facing America's unilateral changes in trade policy and tariff threats is also puzzling. Institutional and inter-

governmental perspectives miss how the US ability to change institutional rules flows from a hierarchical global system. Moreover, internal economic interests divide the EU. Profits for Europe's high tech and IPR-rich firms rely on the TRIPs and on integration into US firms' commodity chains. The US thus finds allies in EU domestic politics who support the global status quo.

Endogenous change in the structure of production drives change in the EU–US trade relationship. With multiple industries in flux as the fifth industrial revolution matures and as the sixth begins, the EU–US trade relationship will necessarily change as well. Unlike the Bretton Woods 2 era, though, the rules are unlikely to be written unilaterally by the US, given an increasingly powerful China and politically divided America. Moreover, US geostrategic attention is likely to remain focused on the Indo-Pacific region until it becomes clear that China accepts the current status quo. As a status quo, trade-dependent polity, the EU faces hard choices. The US need for allies to help contain China gives the EU leverage, but the Russian invasion of Ukraine revealed the EU's profound security dependence on the US. Simultaneously the EU relies equally on the US and Chinese market. The subtle difference here, however, is that US exports compete with Europe's future production, while China's exports compete with current European production.

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## Conflict of Interests

The author declares no conflict of interests.

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