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Paul J.J. Welfens / David Hanrahan

The EU-US Trade and Technology Council: Developments, Key Issues and Policy Options

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EUROPÄISCHES INSTITUT FÜR INTERNATIONALE WIRTSCHAFTSBEZIEHUNGEN (EIIW)/
EUROPEAN INSTITUTE FOR INTERNATIONAL ECONOMIC RELATIONS
Bergische Universität Wuppertal, Campus Freudenberg, Rainer-Gruenter-Straße 21,
D-42119 Wuppertal, Germany
Tel.: (0)202 – 439 13 71
Fax: (0)202 – 439 13 77
E-mail: welfens@eiiw.uni-wuppertal.de
www.eiiw.eu

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Summary:

Following the failure of the Transatlantic Trade and Investment Partnership project, the European Union and the United States have considered options on how to organize transatlantic cooperation within what may be considered an adequate framework – a different approach has been agreed in the Trade and Technology Council (TTC). Such initiatives are fundamental pillars of transatlantic economic integration. The US and the EU have indeed started a new initiative which is based on ten policy fields which have potential for enhanced cooperation; there is a triple focus, namely on common values, on options for better joint standard-setting and on cooperating in new fields, e.g. the digitalized economy. With the Russo-Ukraine War, the relevance of more transatlantic cooperation has been reinforced, not least since this military conflict indirectly raises the issue of to what extent economic relations between the West and China could also deteriorate in the medium term. While the ten areas considered by the EU and US within the framework of the TTC indeed stand for crucial fields, one should not overlook that three additional fields have been largely neglected so far: (i) ICT market integration and the transatlantic integration of internet-based markets, respectively; (ii) challenges for transatlantic cooperation – indeed win-win opportunities – in the field of climate-stabilizing innovations; and (iii) the crucial role of reducing barriers to transatlantic foreign direct investment. The latter have been shown to be of critical relevance for output dynamics and the current account-Gross Domestic Product ratio, namely in the FDI-enhanced DSGE macro model of Roeger/Welfens (2021) which allows in a new way to consider, for example, the national and international effects of product innovations and process innovations. It should also be emphasized that the international spillover effects of ICT innovations imply that there is a broader need for transatlantic policy cooperation which, paradoxically, also requires more cooperation between national governments of EU countries and the governments of US states. As regards enhanced transatlantic economic policy cooperation, new initiatives here should not mistakenly be considered a substitute for long-term cooperation in the fora of international organizations.

Zusammenfassung:

Nach dem Scheitern des Projekts der Transatlantischen Handels- und Investitionspartnerschaft haben die Europäische Union und die Vereinigten Staaten über Optionen nachgedacht, wie die transatlantische Zusammenarbeit in einem angemessenen Rahmen organisiert werden kann - im Handels- und Technologierat EU-USA (TTC) wurde ein anderer Ansatz vereinbart. Solche Initiativen sind grundlegende Pfeiler der transatlantischen Wirtschaftsintegration. Die USA und die EU haben in der Tat eine neue Initiative gestartet, die sich auf zehn Politikfelder stützt, die Potenzial für eine verstärkte Zusammenarbeit haben; es gibt einen dreifachen Fokus, nämlich auf gemeinsame Werte, auf Optionen für eine bessere gemeinsame Standardsetzung und auf die Zusammenarbeit in neuen Bereichen, z.B. der digitalisierten Wirtschaft. Mit dem Russland-Ukraine-Krieg hat sich die Relevanz einer verstärkten transatlantischen Zusammenarbeit verstärkt, nicht zuletzt weil dieser militärische Konflikt indirekt die Frage aufwirft, inwieweit sich mittelfristig auch die wirtschaftlichen Beziehungen zwischen dem Westen und China verschlechtern könnten. Während die zehn Bereiche, die von der EU und den USA im Rahmen des TTC in Betracht gezogen werden, in der Tat für entscheidende Felder stehen, sollte man nicht übersehen, dass drei weitere Felder bisher weitgehend vernachlässigt wurden: (i) die Integration der IKT-Märkte bzw. die transatlantische Integration der internetbasierten Märkte; (ii) die Herausforderungen für die transatlantische Zusammenarbeit - und die Chancen für beide Seiten - im Bereich der klimastabilisierenden Innovationen; und (iii) die entscheidende Rolle des Abbaus von Hindernissen für transatlantische Direktinvestitionen. Letztere haben sich als von entscheidender Bedeutung für die Produktionsdynamik und das Verhältnis zwischen Leistungsbilanz und Bruttoinlandsprodukt erwiesen, und zwar in dem um Direktinvestitionen erweiterten DSGE-Makromodell von Roeger/Welfens (2021), das es auf neue Weise ermöglicht, z. B. die nationalen und internationalen Auswirkungen von Produkt- und Prozessinnovationen zu berücksichtigen. Es sollte auch betont werden, dass die internationalen Spillover-Effekte von IKT-Innovationen einen größeren Bedarf an transatlantischer politischer Zusammenarbeit implizieren, die paradoxerweise auch mehr Zusammenarbeit zwischen den nationalen Regierungen der EU-Länder und den Regierungen der US-Bundesstaaten erfordert. Was die verstärkte transatlantische wirtschaftspolitische Zusammenarbeit betrifft, so sollten neue Initiativen in diesem Bereich nicht fälschlicherweise als Ersatz für eine langfristige Zusammenarbeit in den Foren internationaler Organisationen angesehen werden.

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Paul J.J. Welfens, *Jean Monnet Professor for European Economic Integration; Chair for Macroeconomics; President of the European Institute for International Economic Relations at the University of Wuppertal, (EIIW), Rainer-Gruenter-Str. 21, D-42119 Wuppertal; +49 202 4391371), Alfred Grosser Professorship 2007/08, Sciences Po, Paris; Research Fellow, IZA, Bonn; Non-Resident Senior Fellow at AICGS/Johns Hopkins University, Washington DC.*

welfens@eiiw.uni-wuppertal.de, *www.eiiw.eu*

David Hanrahan, *Research Associate at the Chair for Macroeconomic Theory and Policy and Research Assistant at European Institute for International Economic Relations (EIIW) at the University of Wuppertal, Rainer-Gruenter-Str. 21, 42119 Wuppertal, Germany.*

hanrahan@eiiw.uni-wuppertal.de *www.eiiw.eu*

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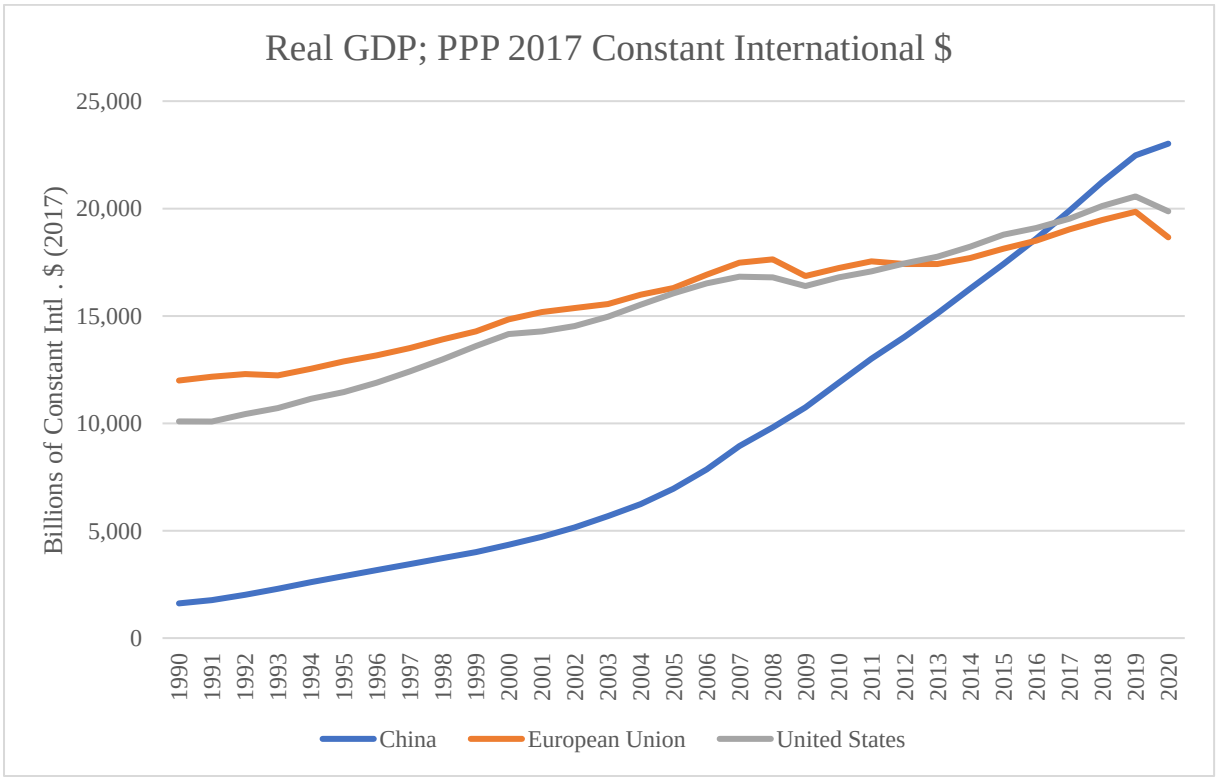
1. Introduction

Transatlantic trade links and technological cooperation – and indeed competition – are key pillars in the foundations underpinning the strength of Western economies. The Transatlantic Trade and Investment Partnership (TTIP) project under President Obama could not be realized as a broad US-EU liberalization program; mainly because President Trump, as Obama's successor, was not supportive of the basic economic view that more international integration would be mutually beneficial but also because there was strong political opposition in both Germany and France which resulted in broad resistance in two leading EU economies against this project. The failure of the TTIP project implies that a historical opportunity for both the US and the EU to push for new, joint, global standards in industry in the early 21st century was missed. With China's economic size expected to grow over many decades in the 21st century, and is already considered to be the largest economy in terms of gross domestic product in purchasing power parity since 2017 (see Figure 1), one has to anticipate that Chinese industry's interests will have a strong influence on new global standards in the coming decades.

Figure 1: Real GDP in Purchasing Power Parity Figures, US, EU and China (in Billions of 2017 Constant International Dollars)



Source: Own representation of data available from the World Bank; https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD?locations=CN-US-EU

The conflict-oriented trade policy of President Trump vis-à-vis China and partly also vis-à-vis the EU was largely motivated by the fear that the US trade balance and current account balance deficit – relative to US gross domestic product - could continue to increase in the medium term (Roeger/Welfens, 2022); the rising bilateral trade deficit of the United States vis-à-vis China was interpreted by the Trump Administration as being evidence of a critical economic weakness

on the part of the US in certain sectors, but also as reflecting unfair barriers to trade from the Chinese side. However, one should not overlook that the US is a leading economy in such technologically crucial fields as Information and Communication Technology (ICT), aviation and space, as well as banking services (the latter two sectors in turn being strongly ICT intensive in terms of production and the provision of services, respectively).

The EU-US Trade and Technology Council (TTC) is a transatlantic forum to promote dialogue and cooperation on policy between the EU and US on issues of mutual concern, in particular related to technology, trade, strategic security with regard to key sectors as well as more generally on issues such as supporting democracy and the rule of law. The TTC might be used in a temporary fashion to deal with topics which would normally be discussed in the environment of the World Trade Organization (WTO), where there has been little progress in terms of reform during the period from 2015-2021; however, both the EU and the US would be wise to reinforce the WTO in the medium term – through adequate reforms as had been suggested in prior years – and indeed to reinforce other international economic organizations in an adequate way where not only the West but also Asian countries, including China, and other countries would have strong incentives to solve conflicts rather within the framework of such organizations rather than allow conflicts to escalate.

Following previous unsuccessful attempts to strengthen or formalize transatlantic economic ties, most notably via the proposed Transatlantic Trade and Investment Partnership (TTIP) or the Transatlantic Economic Council, the TTC was established after efforts of the current von der Leyen Commission to establish a closer working relationship with global partners since 2019. Particularly during the Trump administration, EU-US relations had deteriorated, resulting in trade war and the imposition of tariffs and counter-tariffs including Section 232 “national security” tariffs (Federal Register, 2018). The TTIP negotiations, having been largely inactive since 2016, were concluded unsuccessfully in 2019. However, in January 2020, still under the Trump administration, the then European Commissioner for Trade, Phil Hogan, gave a keynote speech in the United States under the heading "Refreshing Transatlantic Relations" (European Commission, 2020a). In his speech Commissioner Hogan highlighted some of the primary challenges facing the West, namely, digitalization and technological advances, the rise of China, climate change, global demographic shifts and the impact of international trade on workers and households. To address such challenges, Hogan stressed the need to improve bilateral transatlantic relations, to support WTO reform, update the multilateral rulebook and multilateral system in the face of an increasingly globalized world, and to promote transatlantic cooperation “let’s talk, let’s cooperate, let’s lead” (European Commission, 2020a).

Under President Trump, little progress was made in terms of improving transatlantic relations and economic ties. The same sentiments were repeated by Commission President Ursula von der Leyen at her State of the Union address in September 2020 (European Commission, 2020b; emphasis added):

*“...we are ready to **build a new transatlantic agenda**. To strengthen our **bilateral partnership** – be it on **trade**, **tech** or **taxation**. And we are ready to work together on **reforming the international system** we built together, jointly with **like-minded partners**. For our own interests and the interest of the common good.”*

Following the election of President Joe Biden in November 2020, and facing the global Covid-19 pandemic that was rupturing global supply chains and weakening the global economy (Welfens, 2020), the United States began to re-engage with multilateral bodies and internationally-coordinated approaches to macro challenges. However significant areas of transatlantic disagreement remained, for example in the area of digital security, data protection and privacy and global tax rules. Nevertheless, at the EU-US Summit on June 15, 2021, the creation of an EU-US Trade and Technology Council was officially announced by both the EU and US (European Commission, 2021b; White House, 2021). The TTC was intended to be a forum for the US and EU "to coordinate approaches to key global trade, economic, and technology issues and to deepen transatlantic trade and economic relations based on shared democratic values". The TTC is intended to operate on a cross-agency, multi-department, government-wide basis on both sides of the Atlantic.

2. Economic Goals on both Sides of the Atlantic

To see the possible approach of both parties towards the TTC and try to understand what both parties seek to achieve through the TTC as an institution, it is worth comparing the intended goals (main or shared) of the TTC from an EU and US perspective (see Table 1).

Table 1: Comparative View of the Primary Goals of the Trade and Technology Council

US	EU
• Cooperate in the development and deployment of new technologies based on shared democratic values, including respect for human rights. • Ensure that trade policies and the deployment of emerging technologies are informed by national security and scientific priorities as well as by economic and commercial priorities. • Increase the competitiveness of the transatlantic economy and ensure our joint leadership in setting global norms for emerging and other critical technologies that are based upon our shared democratic values. • Maintain U.S. and allied leadership in science and technology while countering authoritarian influence in the digital and emerging technology space.	• Expand and deepen bilateral trade and investment • Avoid new technical barriers to trade • Cooperate on key policies on technology, digital issues and supply chains • Support collaborative research • Cooperate on the development of compatible and international standards • Facilitate cooperation on regulatory policy and enforcement • Promote innovation and leadership by EU and US firms

Source: Own representation of the "main goals" according the European Commission (2021b) and the "shared goals" (US State Department, 2022)

The TTC is co-chaired by five officials, two from the EU and three from the US, namely US Secretary of State Antony Blinken, US Secretary of Commerce Gina Raimondo, US Trade Representative Katherine Tai with Executive Vice-Presidents of the European Commission, Competition Commissioner Margrethe Vestager and Trade Commissioner Valdis Dombrovskis. These chairs oversee the main body of the TTC which is comprised of ten Working Groups of officials tasked with picking up political initiatives and working analytically and pursuing technical negotiations covering distinct areas to achieve operational deliverables which can be presented back to policymakers. The ten working groups are as follows (European Commission, 2021b):

1. Technology Standards Cooperation
2. Climate and Clean Technology
3. Secure Supply Chains
4. Information and Communication Technology and Services Security and Competitiveness,
5. Data Governance and Technology Platforms
6. Misuse of Technology Threatening Security and Human Rights
7. Export Controls
8. Investment Screening
9. Promoting Small- and Medium-Sized Enterprises (SME) Access to and Use of Digital Tools
10. Global Trade Challenges

The first meeting of the TTC took place in Pittsburgh on 29 September, 2021, after being called into question during a diplomatic dispute over a deal for submarines and security arrangements between the US, UK and Australia (with France arguing that "unfair competition" from the side of the UK and the US had effectively won them the large Australian tender undermining French deals with that country to produce submarines). The working groups discussed topics in their relevant areas and agreed to closer cooperation while proposing concrete measures with regard to fields mutual interest such as (White House, 2021). It was found that the EU and US should:

1) Introduce "investment screening" of inward foreign direct investment into both jurisdictions for the identification of possible issues concerning national security and public order;
2) Cooperate on export controls particularly with regard to dual-use items;
3) Pursue Artificial Intelligence developments that while innovative, are also deemed to be trustworthy and which support universal human rights and shared democratic values;

4) Cooperate on the rebalancing of global supply chains in semiconductors, a critical input for modern, digitalized, economies;

5) Work closely together to address non-market, trade-distortive policies and practices globally, while also maintaining competitive, free, and fair transatlantic trade in new and emerging technologies by avoiding barriers to trade, protecting workers rights, combating child labor and slavery and addressing further trade-related, climate, and environmental issues.

In order to facilitate the work of the TTC, and to avoid the fate of previous transatlantic initiatives whereby negotiations would slow and progress essentially freeze, certain contentious issues were left outside the scope of the TTC. To deal with these issues, parallel to the TTC, the EU and US also agreed to establish another body, the Joint Technology Competition Policy Dialogue (JTCPD) which will focus on developing common approaches and strengthening cooperation on competition policy and enforcement in the ICT/tech sectors – here, some key issues which may have hampered progress under the TTC such as privacy and the EU's proposed Digital Markets Act will be discussed. Amongst the other key issues which will remain sources of potential disagreement are privacy and data in the digital sphere. These topics have largely been omitted from the remit of the TTC meaning key areas of transatlantic tension may not be resolved via the TTC.

On both sides of the Atlantic, stakeholders will be invited to deliver inputs. In particular, this involves both parties inviting industry representatives, civil society, NGOs, think tanks and academics to contribute to the work of the TTC teams in an effort to ensure that the TTC deals with the topics and challenges which are seen as the most relevant and pressing for the economies of both the US and EU (see, e.g., US Department of Commerce, 2022; European Commission, 2022).

At the second officially meeting of the TTC - which was held place in Paris-Saclay, France, on May 15 and 16 2022 – the co-chairs met to discuss progress and meet stakeholders. Early progress could be realized with a minimal initial effort – an especially important summit in the context of a difficult period for international organizations and the global economy due to the Russo-Ukrainian military (Welfens, 2022) conflict. There was indeed a strong focus on the conflict, the sanctions regime imposed on the Russian Federation and on stated goals of the TTC such as support for freedom, democracy, the rule of law and multilateralism (TTC, 2022). Certain concrete key outcomes from the working group negotiations were indeed announced by the chairs, including (White House, 2022, pp. 1-2):

- "Deeper information exchange on exports of critical US and EU technology, with an initial focus on Russia and other potential sanctions evaders, coordination of US and EU licensing policies, and cooperation with partners beyond the United States and the European Union;

- Development of a joint roadmap on evaluation and measurement tools for trustworthy Artificial Intelligence and risk management, as well as a common project on privacy-enhancing technologies;

- Creation of a US-EU Strategic Standardization Information (SSI) mechanism to enable information sharing on international standards development;

- An early warning system to better predict and address potential semiconductor supply chain disruptions as well as a Transatlantic approach to semiconductor investment aimed at ensuring security of supply and avoiding subsidy races;

- A dedicated taskforce to promote the use of trusted/non-high-risk ICTS [Information and Communication Technology Services] suppliers through financing for deployments in third countries;

- A new Cooperation Framework on issues related to information integrity in crises, particularly on digital platforms, with a focus on ongoing issues related to Russian aggression, including Russia's actions to manipulate and censor information;

- A stakeholder-focused Trade and Labor Dialogue to discuss policy options to promote internationally recognized labor rights and to help workers and firms make successful digital and green transitions, remain globally competitive, and enjoy broad and inclusive prosperity;

- An early dialogue on shared trade concerns regarding third-countries measures or initiatives and an early stage consultation mechanism regarding bilateral barriers that may disadvantage the transatlantic economy;

- A policy dialogue aimed at developing responses to global food security challenges caused by Russian aggression in Ukraine; and

- A US-EU guide to cybersecurity best practices for small- and medium-sized companies, whose business is impacted disproportionally from cyber threats."

The announced steps show how the conflict in Ukraine, and related issues such as adherence to sanctions, food security, cybersecurity, and information especially on digital platforms played a major role in discussions.

3. Selected Additional Key Topics

The perceptions for transatlantic cooperation are rather different in the EU and the US which indeed share some common interests (e.g., establishing cyber security in a solid way) but there are also specific national (or supranational) interests on both sides of the Atlantic. In the list of topics missing in the official agenda of the TTC so far are three main elements:

- Improving the access of foreign investors from both sides of the Atlantic in the markets of the US and the EU, respectively; foreign direct investment is crucial in certain sectors for international technology transfer, but is also a driver of regional and global trade, namely in the context of Vernon's product cycle trade approach (Vernon, 1966).

- Enhancing the integration of telecommunication services in a transatlantic framework so that economies of scale and higher innovation dynamics in both the United States and the European Union could be reinforced; to some extent, the integration of

telecommunication markets in the EU is visibly insufficient when compared to the US markets for telecommunication services.

- Opening up climate-related CO2 emission certificate trading - which covers circa 40% of CO2 emissions in the EU and more than 80% of regional emissions in California – to transatlantic trade: that would mean the international integration of the EU and California CO2 emission trading; ideally, the US could encourage more states to adopt CO2 emission trading. Just as California had integrated its emissions trading system with those of regional provinces in Canada (namely with Quebec and, for a rather short time, Ontario), one may consider the options for a long-term transatlantic integration of CO2 emission certificate markets Both the EU and California/the US could benefit strongly from such an arrangement which (Welfens, 2022), however, would require common decisions with regard to setting firstly the cap on certificates and, secondly, the reduction of the caps which fix the annual percentage reduction of the overall CO2 emissions in the EU and California. The US is likely to have a current account surplus in CO2 emission certificate trading; at least if one considers the CO2 emission certificate price in California which was much lower in 2019/20 than in the EU. The EU could enlarge the sectoral coverage of CO2 emission certificates which would amount to a more efficient climate change policy (e.g., office buildings and transportation could be integrated into the existing CO2 certificate trading system). In a transition period, it would be sufficient that the cap for both the EU and California would be the same; in the long term it would be desirable to construct an integrated G20 market for CO2 certificate emission trading.

There are crucial economic policy conclusions to be drawn on both sides of the Atlantic; and in the EU there is the additional medium-term challenge of an EU-Ukraine enlargement which in turn will change the internal power balance within the community. As regards the European Commission's strategic policy orientation, one may argue that crucial transatlantic perspectives indeed have to be considered.

4. Economic Policy Perspectives and Research Challenges

In the field of ICT innovation, one may expect that positive international spillover effects should be more relevant than in the Old Economy. This would imply that more joint R&D support by governments – that is cooperation in R&D policy – is required. Besides the US Department of Defense and the Department of Energy, there is relatively little by way of national R&D financing at the central (federal) policy layer in the United States; most R&D support comes from the state governments. From this perspective, transatlantic international R&D spillover effects would require cooperation between certain US states and the national governments of EU countries: This type of transatlantic cooperation has not been really considered so far (and there is lack of empirical estimates on sectoral international spillover effects), but it is an urgent policy innovation if an optimal internalization of positive international R&D effects is to be achieved. Such policy innovation indeed is crucial for the US and the EU if the West is to face the technological challenge from China in an adequate way.

It is clear that at the international negotiation table, the economic weight of the European Union (as the EU27) is about 18% percent smaller than that of the EU28 – i.e., the EU including the United Kingdom prior to BREXIT (Welfens, 2017). A medium-term enlargement of the EU to admit Ukraine as a new member is conceivable and such a new EU28+ (whereby the + stands for some of the current candidate countries in the Western Balkans) might be even more attractive to the US as a trading partner than the current EU27. However, there also is some risk that further EU enlargements will serve to increase the economic heterogeneity of the European Union which would make political consensus building in a new, enlarged, EU28+ more difficult to achieve than in the old EU28. As regards the economic relations of the US with Ukraine, in May 2022 the United States decided to unilaterally reduce/remove the import tariffs imposed so far on key exports from Ukraine. If the EU and Ukraine could agree on a rather fast eastern EU enlargement encompassing Ukraine, the United States government would be wise to take into account the shifts in the power balance with regard to individual member countries in a new EU28 group – including Ukraine; careful analysis and consideration of changes in the Banzhaf power index post-BREXIT, on the one hand (Kirsch, 2016), and changes in the Banzhaf power index in the context of an EU Ukraine enlargement (for more, see Kirsch, 2022) are of particular relevance here. Countries which have gained in terms of relative political voting power in the EU - as measured by the respective national Banzhaf index - may be expected to enjoy an enlarged political influence within the EU when it comes to policy fields in which a weighted majority voting process applies (essentially all fields with the exception of taxation and foreign policy) and those countries in turn can be expected to obtain enlarged shares from the EU budget; this could indeed accelerate the economic catching-up process in the respective country. At the same time, there is – from the perspective of major net contributing countries to the EU budget – considerable risk that the EU policy agenda will orient more towards EU redistribution activities which might undermine political support for regional integration and the EU in countries such as Germany, Austria and Sweden that are amongst the leading net contributor countries in the European Union.

One particularly interesting research question concerns the comparisons of "gross export" and "net export" GDP ratios (net export here defined as national export value-added) as well as of the "gross import" and "net import" GDP ratios (net import defined as national import value-added) for both sides of the Atlantic. Imported intermediate goods are of particular economic relevance here for the EU since certain net imports from the US are, in turn, highly relevant for EU exports in certain sectors. Moreover, the innovativeness of US subsidiaries in the EU is crucial for the overall international competitiveness of the EU in certain sectors. In a mirror perspective, it holds that imported intermediate goods from the EU are relevant for the international competitiveness of certain firms and sectors of the US, respectively. Moreover, the innovativeness of EU subsidiaries in the US is highly relevant for the US international competitiveness in certain sectors. The OECD Trade in Value-Added (TiVA) database and OECD-WTO statistics will be useful here. The TiVA data are also particularly useful in determining the importance of imported intermediate goods for EU exports to the US by comparing the EU gross export ratio with the EU value-added export ratio accordingly: 3.48% was the EU gross export ratio to the US in 2018, while the corresponding value-added export ratio was 2.93%; EU exports to the US reflecting imported intermediate goods were equivalent to 0.55% of EU27 gross domestic product. The US gross export ratio towards the EU in 2018 was 2.19% of US gross domestic product; whereas the value-added export ratio was 2.03%. Thus, the imported products included in US exports towards the EU amounted to 0.15% of US

gross domestic product. While in the case of US exports to the EU, 6.8% of exports represented imported intermediate products, the share of imported intermediate products (from third countries) of EU exports was 15.8%.

Table 2: EU-US Bilateral Trade; Gross Exports and Domestic Value Added as Percentage of GDP

	1995	2000	2005	2010	2015	2018
US Gross Exports to EU (%GDP)	2.06	2.05	1.94	2.15	2.14	2.19
US DVA* Exports (%GDP)	1.90	1.87	1.77	1.96	1.98	2.03
EU Gross Exports to US (%GDP)	2.11	3.72	3.06	2.54	3.62	3.48
EU DVA Exports to US (%GDP)	1.92	3.25	2.64	2.13	3.04	2.93

Note: *DVA – Domestic Value Added (value-added in gross exports). Figures relate to bilateral gross exports; all figures used in calculations were in nominal US dollars (figures for EU27 in Euro were converted using the OECD annual exchange rate)

Source: Own calculations using data available from the OECD TiVA database, Primary indicators.

In 1995, the figures for gross exports relative to GDP and value-added exports relative to GDP were little different for both the EU and the US, whereas in 2018 the EU gross export ratio relative to the EU value-added export ratio was relatively larger than the difference in the corresponding US figures (see Table 2). This implies that imported inputs were proportionately larger in EU exports than in the US case, which in turn points to potentially greater import supply chain risks and thus greater export risks for the EU than in the case of the US. It is also conceivable that the relatively high share of imported intermediate goods in EU exports to the US indicates that the EU - following the logic of the export gravity equation (in which the level of the domestic gross domestic product of export country (i), the level of the partner country (j) gross domestic product and the transport costs or the geographical distance between country i and j play a role) - is geographically more favorably located or closer to efficient supplier countries than the US. EU export surpluses vis-à-vis the US are likely to depend positively on imported intermediate product intensities, so that a threatening de-globalization of the world economy post-2024 could cause EU trade surpluses vis-à-vis the US to shrink. In addition, the bilateral surpluses of individual EU countries vis-à-vis the US could depend on the presence or relative strength of US subsidiaries. For example, to the extent that the EU has a higher share of Chinese imported inputs compared to the US, Corona-related city and regional lockdowns are likely to pose a relatively greater risk to EU exports to the US than is the case for US exports to the EU.

Finally, considering product and process innovations in EU countries has thus far been covered by regular EU surveys and analysis (in the EU, the Community Innovation Survey is completed biennially) and it would be of particular interest to analyze each sector separately with respect to the influence of US subsidiaries in the respective sectors in the EU. This would allow a better understanding of product and process innovation dynamics in the EU and their main drivers.

At the same time, one may note that the US lacks such an Innovation Survey with a nationwide split of the respective firms' product innovativeness and process innovativeness, respectively. As has been shown in an FDI-enhanced DSGE macro model (Roeger/Welfens, 2021) – the first

DSGE model which includes both trade *and* foreign direct investment - there is a crucial role for product innovations and process innovations, respectively; one can consider the effects of innovations, for example in the FDI-based sector 2 with and without (transatlantic) spillover effects - see the appendix. From more transatlantic comparative innovation analysis, both the US and the EU could benefit and indeed it would be useful to create an analytical basis to support the development and promotion of adequate innovation policies and adequate transatlantic R&D funding which helps to internalize positive national and international external effects from R&D and innovation, respectively. As regards sectoral perspectives, with a strong element of both foreign direct investment and high innovation dynamics, the ICT sector is of key importance here.

In a trilateral perspective, more cooperation between the EU and the US could be useful in the field of regulatory policy and possibly also in joint transatlantic research projects which would reinforce both the US and the EU position vis-à-vis China where the government emphasizes ICT expansion and artificial intelligence in R&D support and China's 'China Standard 2035' strategy (Seaman, 2020). While US companies are global leaders in ICT, several EU companies in the ICT sector also are rather strong (e.g., SAP, Dassault, Deutsche Telekom, France Telekom, Siemens as well as many leading SME firms with innovative digital products or services). Common transatlantic internet and cloud rules could help to create larger digital markets; the EU might have to consider problems with over-regulation in certain digital fields, while the US regulatory policy in some fields seems to be not strict enough when it comes to consumer protection. The recent experience with the Corona shocks have contributed to digital economic expansion in the US, the UK, France and Germany: Work-from-home (WFH) has strongly increased and – depending on the digitalization basis of the respective sectors – there were considerable labor productivity increases in some sectors even during the Corona recession (see, e.g., de Vries/Erumban/van Ark, 2021; Wilke/Welfens, 2022).

As regards climate-stabilizing green innovation dynamics, there is a need on both sides of the Atlantic to empirically study the role of ICT innovations in particular. It is well-known that leading telecommunication companies on both sides of the Atlantic have developed technology-oriented programmes which are expected to enhance steps towards long run climate neutrality, for example with the founding of the European Green Digital Coalition by dozens of telecom and ICT CEOs and managers (European Commission, 2021a). One may also consider the role of certain international organizations, including the International Telecommunications Union, the United Nations and the International Monetary Fund which are conducting research and contributing case studies on the role of ICT and the Internet, respectively, for economic variables. Such variables concern issues such as productivity growth, output growth, inflation pressure and innovation dynamics, amongst others.

The ICT sector itself has been growing over time in both the US and the EU on the one hand. on the other hand, the decline of relative ICT prices on both sides of the Atlantic has reinforced the share of ICT capital over time in both the European Union and the United States. Hence the environmental and climate-relevant technical progress strongly depends on innovation dynamics in the ICT sectors of the EU and the US.

There are crucial analytical and economic policy challenges in the new transatlantic cooperation initiatives. It is highly desirable – not least given certain economic effects of the Russo-Ukrainian War of 2022 – that the EU and the US reinforce the cooperation in the economic

field. The political situation is rather complex as the TTIP negotiation rounds were not successful and stand for a negative case study of transatlantic liberalization efforts where, to some extent, the over-burdening of the negotiation agenda was a problem: In particular, the topic of investment protection agreements was conflict-prone and such agreements were not really necessary for a transatlantic liberalization project. However, the TTIP initiative also stood for lack of adequate communication between the European Commission/the European Parliament and the public in EU member countries. Thus, there is a need for an adjusted negotiation agenda – with more support for scientific analysis to highlight the pros and cons of more transatlantic cooperation (and to quantify the main net benefits) – and it is also necessary to implement a more modern communication strategy on the side of the European Commission and the European Parliament, possibly in combination with institutions of national member countries. As regards enhancing transatlantic cooperation it is important:

- To develop a better joint economic understanding of the key opportunities and challenges in a macroeconomic and sectoral perspective; the FDI-based DSGE model is of particular relevance here as the US is a strong foreign investor in the EU and the EU a strong foreign investor in the US.

- There are transatlantic technology spillovers which thus far are not internalized: To some extent, internalization obviously takes place through license payments of subsidiaries (e.g., US subsidiaries located in the EU pay royalties to US parent companies for using new US technologies; and EU subsidiaries located in the US pay royalties to parent companies in the EU). However, there could be insufficient internalization which in turn would require more transatlantic joint R&D funding; the creation of a joint R&D promotion fund of the US and the European Union would also be advisable.

- To consider the issue of sequencing, e.g. in digital regulation – which ranges from telecommunication services to artificial intelligence. Sequencing means to firstly consider those fields in which short-term benefits on both sides are possible to realize on the one hand, on the other hand sequencing should also allow to generate a critical momentum of cooperation which then is the basis to start more complex fields of cooperation.

There are large opportunities for transatlantic economic developments to be achieved on a win-win basis. Scientific analysis can help to identify key opportunities.

At the bottom line, there are considerable opportunities for transatlantic cooperation fields where both sides could benefit. Enhanced EU-US cooperation could also be supported by bilateral cooperation projects - e.g., the Transatlantic Business Initiative which is an initiative in which Germany's industry and services sector are represented. As regards sequencing, one should give priority to short-term projects of mutual interest and to long-term projects in areas in which the strategic interests of both the US and the EU have a large overlap. Digital health care services as well as Artificial Intelligence, where both the EU and the US have strong players in research and innovation, respectively, could be strategic fields of joint interest; as regards digital health care, the US could benefit considerably if the health care expenditures relative to gross domestic product would decline due to efficiency gains realized through enhanced digital health care management (particularly in the hospital sector). Digital training

and retraining could be particular fields in which some EU countries plus Switzerland - facing a strong challenge from ageing societies – might adopt an international leadership role; the US, which faces fewer ageing dynamics than the EU in the medium term, will nevertheless experience more pressure from ageing in the long run and thus stands to learn and benefit - with a certain delay - from progress in Europe. Climate-friendly joint innovation projects also could be part of a new Transatlantic Cooperation Policy.

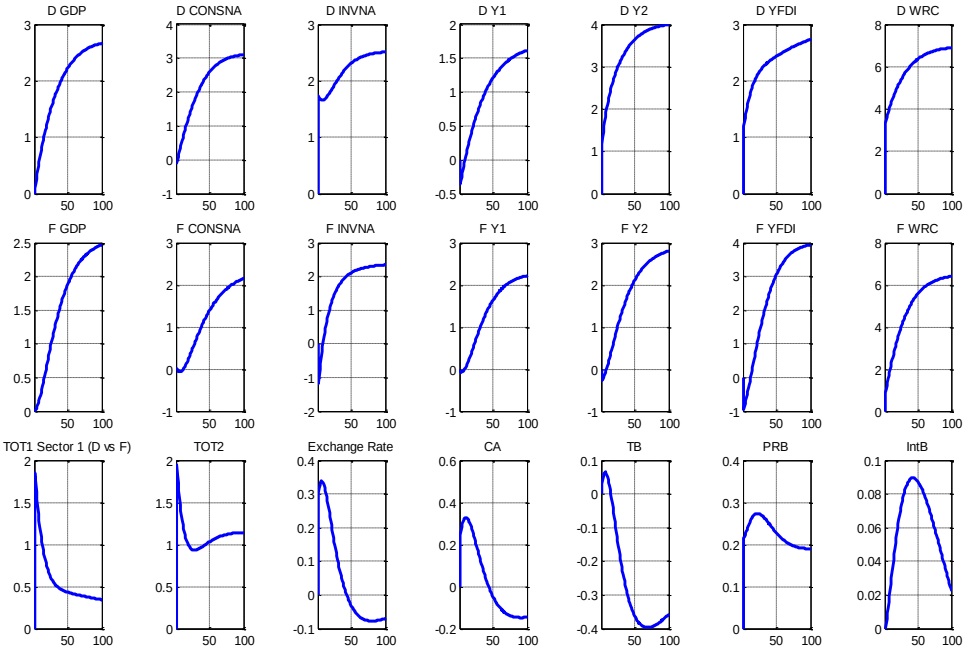
Joint "climate-friendly" innovation projects could also be part of a new transatlantic cooperation policy. Green and digital cooperation fields are likely to be of increased importance on both sides of the Atlantic in the longer term. Research, including on EU countries, has suggested that deeper stock markets go along with more green innovativeness stock market dynamics and the interrelationship between stock market intensity and CO2-mitigation progress as well as climate-stabilizing innovation dynamics. (De Haas/Popov, 2019; Welfens/Celebi, 2020).

According to the research, therefore, countries with relatively developed stock markets (meaning the size of stock market relative to the sum of stock and bond markets) such as the US, UK and Sweden, could have higher climate-friendly innovation dynamics than say other EU countries, which in turn could lead to considerations that the role of stock markets is promoted in the interest of climate-friendly innovation dynamics in particular. If some EU countries therefore wanted to follow the US (or British) or Swedish model - in Sweden, trade unions have agreed in collective agreements that part of de facto wage increases is invested in investment funds - and in doing so also to encourage companies from the various sectors to enter the stock market earlier, positive capital market pro-growth and pro-climate neutrality impulses and could arise here.

Appendix

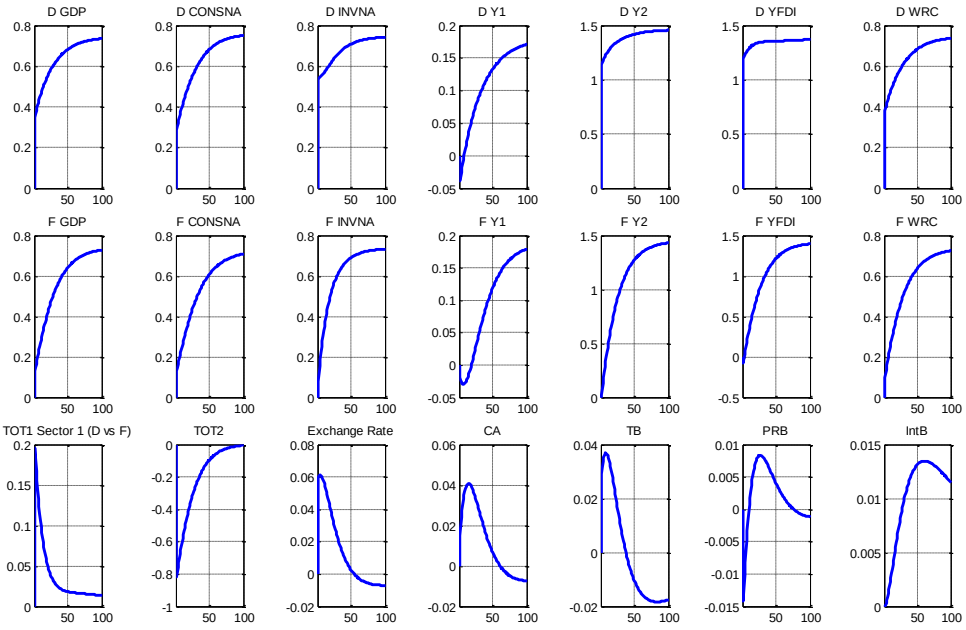
Selected Findings from the Roeger/Welfens (2021) DSGE Macro Model – a) Product Innovation and b) Process Innovations in Sector 2/FDI-based Sector in the Case of International Innovation Spillovers (in the same sector)

Figure 2: Permanent increase of variety/product innovation in sector 2 (with international diffusion); D is domestic, F is foreign (country 2)



Source: Roeger/Welfens (2021), Fig. 7b.

Figure 3: Permanent increase of TFP/process innovation in sector 2 (with international diffusion); D is domestic, F is foreign (country 2)



Source: Roeger/Welfens (2021), Fig. 3b.

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