

# **Government Support for Semiconductors & International Trade Disciplines**

## **Proposed Chips Act for Europe within the Frame of WTO Commitments**

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Master's Thesis in European and International Trade Law

HARN63

Spring 2022



**SCHOOL OF  
ECONOMICS AND  
MANAGEMENT**



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# Abstract

The global semiconductor industry has benefited from a period of intense geographic specialization, yet faces the growing prospect of a new era of turbulence in international trade relations. Severely disrupted by exogenous shocks in global supply chains, the ability of the industry to cater to ceaseless demand growth is jeopardized by an increasing number of initiatives proposed for most industrialized economies to subsidize domestic development and production of semiconductors. The purpose of the study is to identify the array of measures currently being considered to stimulate the European semiconductor industry, along with their corresponding risk of being involved in international trade disputes based on earlier invocations of the WTO SCM Agreement. The study draws lessons from previous disputes citing the SCM Agreement to mitigate the risk of a complainant's success in disputing the proposed EU measures. At the same time, the study considers whether the proposed legislation is coherent in addressing what is likely one of the most complex industries and sophisticated supply chains in the world.



# Foreword

The preparation of this paper has been generously subsidized by the intellectual support and spiritual encouragement of my family, friends, and professors. These contributions, for which I am grateful, have made it possible to confront the challenges of an emergent topic in a complex world.





# Abbreviations

DRAMS	Dynamic Random Access Memory Semiconductors
DSB	Dispute Settlement Body
ECIC	European Chips Infrastructure Consortium
EU	European Union
GATT	General Agreement on Tariffs and Trade
R&D	Research and Development
RTO	Research and Technology Organization
SCM	Subsidies and Countervailing Measures Agreement
SME	Small and Medium -sized Enterprises
TFEU	Treaty on the Functioning of the European Union
US	United States
WTO	World Trade Organization



# 1. Introduction

## 1.1 Background

The economic value and strategic importance of the semiconductor industry shroud tension in the global supply chains that have emerged to develop, manufacture, and distribute these products. Semiconductors captivate the attention of policymakers and embody a model of geographic specialization that has contributed to the industry's expansion, with free flows between research, production, and consumption markets across the world. The creation of leading-edge semiconductors typically involves half a dozen different countries, shuttling the product between different stages of conceptualization, design, fabrication, packaging, and distribution throughout Europe, the United States (US), East and Southeast Asia.<sup>1</sup> In total, global sales of semiconductors are estimated to exceed \$400 billion each year, underpinning both traditional manufacturing as well as emerging digital economy sectors.<sup>2</sup>

The semiconductor industry is characterized by breakneck growth in demand and a ceaseless cycle of innovation. Semiconductor technology promises a wide range of current and potential applications. As semiconductors become more ubiquitous in downstream industrial and commercial goods, their importance is likely to pressure the existing model of geographic specialization, which relies on selective cooperation and is susceptible to disruption.

Lead times to develop new semiconductors are long and the costs of acquiring and operating lithography equipment are high, to the point where production facilities are almost always run at full capacity. The combination of these factors with staffing constraints and an unprecedented growth in demand for consumer goods brought about by the Covid-19 pandemic deeply strained an industry already

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<sup>1</sup> Varas Antonio and others, 'Strengthening the Global Semiconductor Supply Chain in an Uncertain Era' (Boston Consulting Group & Semiconductor Industry Association 2021) <<https://www.bcg.com/publications/2021/strengthening-the-global-semiconductor-supply-chain>> accessed 12 May 2022, pg. 27.

<sup>2</sup> Ibid, pg. 10.

navigating the effects of disputes between key supplier markets, such as export restrictions announced by Japan in 2019 targeting South Korea and an escalation of restrictions by the US on exports to China.<sup>3</sup>

These interventions are illustrative of a growing tendency by governments seeking to shape the industry in their favor, mixing together restrictions on trade flows of semiconductors with the allocation of public funds aimed at enhancing the competitiveness of domestic firms. In a sector famously defined by exponential gains in product performance and constant inverse price pressure, the competitive positioning of firms rest on thin margins.<sup>4</sup>

At the cutting edge, costs for new semiconductor facilities, clean rooms, and the lithography equipment to fill them are on the order of tens of billions of dollars.<sup>5</sup> Research and development (R&D)<sup>6</sup> into new technologies and improvements is a significant and compulsory expenditure for any firm to compete in the market, yet the returns on these investments are notoriously uncertain when compared to other industries. As a consequence, the sector is especially sensitive to government initiatives and has come to rely to a large extent on public support.

Firms in the semiconductor supply chain increasingly find themselves balancing the tightrope between government support and incentives—such as subsidies—on the one hand, while navigating a growing number of trade and investment restrictions on the other. In 2022, the European Commission announced that it would introduce new legislation to support the domestic development and manufacturing of semiconductors in the European Union (EU), following a trend of similar initiatives underway in peer industrialized economies. As governments

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<sup>3</sup> ‘Chip Shortage: How the Semiconductor Industry Is Dealing with This Worldwide Problem’ (World Economic Forum) <<https://www.weforum.org/agenda/2022/02/semiconductor-chip-shortage-supply-chain/>> accessed 20 May 2022; Samuel M Goodman, Dan Kim and John Verway, ‘The South Korea-Japan Trade Dispute in Context: Semiconductor Manufacturing, Chemicals, and Concentrated Supply Chains’ (United States International Trade Commission 2019) <[https://usitc.gov/publications/332/working\\_papers/the\\_south\\_korea-japan\\_trade\\_dispute\\_in\\_context\\_semiconductor\\_manufacturing\\_chemicals\\_and\\_concentrated\\_supply\\_chains.pdf](https://usitc.gov/publications/332/working_papers/the_south_korea-japan_trade_dispute_in_context_semiconductor_manufacturing_chemicals_and_concentrated_supply_chains.pdf)>; Antonio Varas and Raj Varadarajan, ‘How Restrictions to Trade with China Could End US Leadership in Semiconductors’ (Boston Consulting Group 2020) <[https://web-assets.bcg.com/img-src/BCG-How-Restricting-Trade-with-China-Could-End-US-Semiconductor-Mar-2020\\_tcm9-240526.pdf](https://web-assets.bcg.com/img-src/BCG-How-Restricting-Trade-with-China-Could-End-US-Semiconductor-Mar-2020_tcm9-240526.pdf)>.

<sup>4</sup> Referring to Moore’s Law, named after Gordon Moore, co-founder of Intel, who predicted in 1965 that computing power doubled roughly every two years while the price of each unit dropped by half.

<sup>5</sup> Alissa M Fitzgerald, Carolyn D White and Charles C Chung, ‘Economics of Semiconductor Device Manufacturing and Impacts on MEMS Product Development’ [2021] MEMS Product Development 9, pg. 10.

<sup>6</sup> Official publications sometimes refer to Research & Innovation (R&I), however this terminology is treated as synonymous and interchangeable with R&D for the purpose of this study.

increase subsidies to the industry, the global market for semiconductors is likely to become contested through other means. For an industry reliant on cross-border flows of goods and ideas, the compliance of government support measures with international trade disciplines will be put under intense scrutiny as incumbents and newcomers alike seek every angle to gain a competitive edge.

## 1.2 Purpose and Research Questions

In the last three decades, the number of devices and network infrastructure relying on semiconductors has increased dramatically. The greater accessibility and economic importance of semiconductors has coincided with a maturation in the global trading order and passage from the General Agreement on Tariffs and Trade (GATT) framework to a more systematized arrangement under the World Trade Organization (WTO). With the WTO, a series of multilateral agreements have established new trade disciplines, along with a standing body to adjudicate disputes between Members.<sup>7</sup> Simultaneously, observers have noted that the effectiveness of successive GATT negotiation rounds in reducing average tariffs led to alternative forms of protectionism and discriminatory trade practices and governments seeking to shelter domestic industries.<sup>8</sup>

Subsidies are not only a prime embodiment of the phenomenon described above, but are also a central part of the current financial balance of the semiconductor industry.<sup>9</sup> Given the high costs associated with the development and production of semiconductors, as well as the legacy of early public-private cooperation which has grown from areas of exclusive interest like aerospace and defense, the importance of government intervention in the sector is amplified in comparison with other

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<sup>7</sup> World Trade Organization 'WTO Legal Texts' [wto.org/english/docs\\_e/legal\\_e/legal\\_e.htm](http://wto.org/english/docs_e/legal_e/legal_e.htm); On the notable distinctions in the legal character of dispute settlement between the GATT and WTO, see: James Bacchus and Simon Lester, 'The Rule of Precedent and the Role of the Appellate Body' (2020) 54 *Journal of World Trade* <<https://kluwerlawonline.com/journalarticle/Journal+of+World+Trade/54.2/TRAD2020008>> accessed 10 May 2022 & Marc Benitah, *The Law of Subsidies under the GATT/WTO System* (Kluwer Law International 2001), pg. 4.

<sup>8</sup> Bob Fisher, 'Preference Erosion, Government Revenues and Non-Tariff Trade Barriers' (2006) 29 *The World Economy*, pg. 1389.

<sup>9</sup> Simon Lester, Bryan Mercurio and Arwel Davies, *World Trade Law: Text, Materials and Commentary* (3rd edn, 2018), pg. 449; Organization for Economic Co-operation and Development, 'Measuring Distortion in International Markets: The Semiconductor Value Chain' (OECD 2019) TAD/TC(2019)9/FINAL <[https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC\(2019\)9/FINAL&docLanguage=En](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC(2019)9/FINAL&docLanguage=En)> accessed 4 April 2022, pg. 29-32.

industries.<sup>10</sup> Consequently, international rules on government support to domestic industries are especially pertinent.

The purpose of this study is therefore to assess the appropriateness of emerging EU law intended to stimulate the “digital sovereignty” of the semiconductor industry relative to international law on subsidies.<sup>11</sup> The study aims to identify potential aspects of the former that may give rise to disputes under WTO law, thereby offering an indication of design elements that forthcoming legislation might invoke to mitigate against the possibility of trade tensions while considering the overall coherence of proposed measures.

### **1.2.1 Research Question 1: How do Measures to Support the Semiconductor Industry in Proposed EU Legislation fit within International Trade Disciplines on Subsidies?**

The GATT and subsequent WTO have sought to address distortions to international trade arising from domestic subsidies. Adding to the principles established under Article XVI of the GATT, the principal international agreement on government support for domestic industries is the 1994 WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement).<sup>12</sup> The SCM Agreement establishes criteria and procedures for determining the permissibility of subsidies that Members enact, with recourse to remedies in the event that a measure is found not to be in conformity with the Agreement.

The first part of this research question examines the following: can measures proposed by the European Commission in support of the semiconductor industry be construed as meeting the definition of subsidies under the SCM Agreement and, if so, with what implications? Emphasis in this respect is on the pair of financial measures announced by the European Commission in its Communication of February 2022 on a Chips Act for Europe: the proposal for an eponymous Regulation, and separate proposal on Joint Undertakings under the Horizon Europe

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<sup>10</sup> While the early dawn of semiconductor development during the 1940s and 1950s was led by private initiative, the US government and defense research establishment soon became important benefactors. Between 1945 and 1960, government support for R&D is estimated to have increased ninefold: Bo Lojek, *History of Semiconductor Engineering* (2006), pg. 175.

<sup>11</sup> European Commission, ‘Digital Sovereignty: Commission Proposes Chips Act’ <[https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_729](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_729)> accessed 10 May 2022.

<sup>12</sup> The General Agreement on Tariffs and Trade (GATT 1947); World Trade Organization ‘Subsidies and Countervailing Measures: Overview’ [https://www.wto.org/english/tratop\\_e/scm\\_e/subs\\_e.htm](https://www.wto.org/english/tratop_e/scm_e/subs_e.htm)

program.<sup>13</sup> For proposed measures that are determined to meet the definition of subsidies established by the SCM Agreement, the second part of this research question considers which category of subsidies they could be determined to fall under.

### **1.2.2 Research Question 2: How can the Risk of Trade Disputes arising from EU Measures be Mitigated?**

Drawing from the first research question, the second identifies the proposed measures that are at risk of incurring challenges by other Members of the SCM Agreement. In the event of countervailing measures or a trade dispute petitioned to the DSB by another Member of the SCM Agreement, the research question also considers precedents set by previous cases having been raised at the WTO. This is followed by recommendations on adjustments and additions to the proposed legislation that can mitigate the risk of trade disputes arising from the support to the EU semiconductor industry.

### **1.2.3 Research Question 3: Which Steps can be Taken to Increase the Policy Coherence of EU Support to the Domestic Semiconductors Industry?**

The extent of subsidies received by the semiconductor industry is strikingly paradoxical. The industry is based on modern technology and is highly relevant to downstream sectors throughout the economy. There is robust demand from the private sector—often beyond what suppliers can meet. Rather than an ailing industrial relic from a bygone century, firms in the semiconductor industry would appear to be well-positioned to meet their capital requirements through private investments.

The third research question analyzes why subsidies have emerged as a prevalent and preferred intervention by governments to support the semiconductor industry. Following this review, the research question identifies the goals that are stated by the institutions of the EU in advancing the Chips Act for Europe package of

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<sup>13</sup> European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Chips Act for Europe’ COM (2022) 45 final.

legislation, and weighs whether these proposed measures are coherent with existing legislation addressing trade in semiconductors.

### **1.3 Materials and Method**

This section first outlines the sources of law and other materials referenced by the study, before detailing the methodological approach to analyzing the research questions stated in Section 1.2.

#### **1.3.1 Materials**

The study relies on primary texts, principally the WTO SCM Agreement, as well as current and proposed EU legislation: the proposed Chips Act Regulation—to be funded from the Horizon Europe and Digital Europe programs—and legislative proposal to establish the Chips Joint Undertaking.<sup>14</sup> WTO Dispute Settlement Body (DSB) panel reports and, where applicable, Appellate Body rulings are examined to identify prior analysis of issues established through cases addressing relevant subsidy-related measures. Given the broad coverage of the SCM Agreement—intended to apply to a wide range of measures that Member governments might enact in support of domestic industries—DSB and Appellate Body reports are valuable in understanding how the package of initiatives proposed under the Chips Act for Europe might fare in the event of a trade dispute.

Drawing from existing international law—the WTO SCM Agreement—as well as both enacted and proposed EU legislation, the research blends legal dogmatic methods together with qualitative analysis. Council Decision 94/800/EC constitutes the EU’s accession to the 1994 Marrakesh Agreement establishing the WTO.<sup>15</sup> The study assumes the intent to align EU secondary legislation with commitments under international agreements on trade and subsidies, also reflected under Article XVI:4

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<sup>14</sup> In order of reference: European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final; Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013 (Text with EEA relevance) [2021] OJ L170; Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240 (Text with EEA relevance) [2021] OJ L166; European Commission, ‘Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking’ COM (2022) 47 final.

<sup>15</sup> 94/800/EC: Council Decision (of 22 December 1994) concerning the conclusion on behalf of the European Community, as regards matters within its competence, of the agreements reached in the Uruguay Round multilateral negotiations (1986-1994) [1994] OJ L336.



of the WTO Agreement which provides that, “[each] Member shall ensure the conformity of its laws, regulations and administrative procedures with its obligations as provided in the annexed Agreements.”<sup>16</sup> Furthermore, Regulation (EU) 2015/476 empowers the European Commission to implement measures pursuant to findings of the DSB.<sup>17</sup> It is acknowledged that the European legal method is inherently nested within a multi-level legal order. This form of “multi-level judicial protection and enforcement of transnational commercial law” is cited as “the most successful example of cosmopolitan economic law.”<sup>18</sup>

The inclusion and analysis in the study of preparatory works that are not yet passed into law constitutes a non-conventional approach to the doctrinal method. While there is generally no commonly accepted definition of precisely what constitutes legal dogmatic research, it is clear that legislation for which a draft has been proposed, but which has not been enacted, is inferior to other forms of legal doctrine, such as court rulings and statutes in force.<sup>19</sup> There is evidence nonetheless that the DSB has considered so-called *travaux préparatoires* when interpreting the underlying intent of a Member to implement a “specific negotiated commitment”.<sup>20</sup> In this case, official Communications and draft proposals can be considered *travaux préparatoires* as they form part of the legislative process for enacting a Chips Act for Europe, and the SCM Agreement represents a specific negotiated commitment.<sup>21</sup>

The underlying methodology and intent of this study is well-reflected by the following passage: “legal-dogmatic research...is probably best described as research that aims to give a systematic exposition of the principles, rules, and concepts governing a particular legal field or institution and analyzes the

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<sup>16</sup> Marrakesh Agreement Establishing the World Trade Organization [1994], Art. XVI.

<sup>17</sup> Regulation (EU) 2015/476 of the European Parliament and of the Council of 11 March 2015 on the measures that the Union may take following a report adopted by the WTO Dispute Settlement Body concerning anti-dumping and anti-subsidy matters [2015] OJ L83, Arts. 1 & 2.

<sup>18</sup> Ulla Neergaard, Ruth Nielsen and Ernst-Ulrich Petersmann, *European Legal Method - in a Multi-Level EU Legal Order* (DJØF 2012), pg. 327.

<sup>19</sup> Jan M Smits, ‘What Is Legal Doctrine? On the Aims and Methods of Legal-Dogmatic Research’ (Social Science Research Network 2015) SSRN Scholarly Paper 2644088 <<https://papers.ssrn.com/abstract=2644088>>, pg. 5.

<sup>20</sup> David Palmeter and Petros C Mavroidis, *Dispute Settlement in the World Trade Organization: Practice and Procedure* (Cambridge University Press 2004) <<https://www.cambridge.org/core/books/dispute-settlement-in-the-world-trade-organization/3664FC962F898C852ADCB96F8964C03C>>, pg. 81.

<sup>21</sup> Samuli Miettinen and Merita Kettunen, ‘Travaux to the EU Treaties: Preparatory Work as a Source of EU Law’ (Cambridge Yearbook of European Legal Studies 2015), pgs. 147-148.

relationship between these principles, rules and concepts with a view to solving unclarities and gaps in the existing law.”<sup>22</sup>

The proposed legislation comprising the Chips Act for Europe package and other official public communications of the EU institutions are quasi-legal in nature, lending to future interpretation of eventual EU legislation by a judicial body but not having the force of law themselves. In addition, technical and academic literature are relied on for definition of the sector and to understand trade, investment, and government support for semiconductors within the context of historical trends. This includes reference to empirical research by international organizations like the Organization for Economic Co-operation and Development (OECD) and other private and non-governmental observers. Most of the criteria triggering a finding of non-compliance in a dispute over application of the SCM Agreement require a demonstration that the complainant’s domestic industry has suffered economic harm as a result of a measure. Therefore, qualitative data on the current composition and trends in the global market for semiconductors are important to evaluating the potential risk of disputes arising from the EU’s proposed measures.

### **1.3.2 Methodology**

The study methodology proceeds in a series of steps. First, by outlining the definition and structure of the semiconductor industry, the study sets the stage for identifying the specific government support measures and their intended beneficiaries as constituted in the proposed packaged of Chips Act legislation. By taking an inventory of the specific measures in the Chips Act proposal, these are then analyzed relative to the conditions outlined in the SCM Agreement.

To elaborate on how provision of the SCM Agreement have been interpreted in similar disputes, a review of relevant cases is included with reference to the relevant DSB panel reports and, where applicable, Appellate Body findings. Case relevance is determined using filters in the WTO dispute settlement gateway, referencing both previous disputes over semiconductors and over interpretation of specific provisions the SCM Agreement. Due to the similar structural characteristics—strategic importance, research intensity, and high capital costs—the commercial

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<sup>22</sup> Jan M Smits, ‘What Is Legal Doctrine? On the Aims and Methods of Legal-Dogmatic Research’ (Social Science Research Network 2015) SSRN Scholarly Paper 2644088 <<https://papers.ssrn.com/abstract=2644088>> accessed 11 May 2022, pg. 5.

aviation sector, with the long-running Airbus and Boeing disputes is illustrative as to how the core definitions and issues have been interpreted. The WTO DSB is not bound by the principle of *stare decisis*, but review of how panels and the Appellate Body have interpreted the facts of previous cases is nonetheless clarifying as to how rulings in future disputes might be influenced.

The purpose of reviewing of selected WTO dispute settlement cases is to identify characteristics of domestic subsidies to industry that have found to be problematic in the past, and compare these with the measures proposed by the EU in its draft Chips Act legislation. The study aims to highlight proposed measures that are anticipated to be most contentious, with a view to crafting recommendations to reduce the likelihood of being challenged by peer countries.

## 1.4 Delimitations

The methodology and analysis of this study are based on draft legislation that may be revised during the legislative procedure. The Chips Act proposal represents the European Commission's first draft at addressing the issue; by its own admission, consultations, preparatory work, and preliminary impact assessment were limited due to the perceived need to react quickly to vulnerabilities made apparent during the Covid-19 pandemic.<sup>23</sup> The study theorizes potential legal issues based on the published proposal—as available at the time of writing—and the applicable law already in effect, while also acknowledging areas where the European Commission is likely to introduce additional legislation such as Delegated and Implementing Acts in due course.<sup>24</sup>

Although the semiconductor industry has been a subject of international economic significance for several decades now, academic literature addressing the extent of subsidization that firms receive is relatively limited. Most literature directly addressing the nexus of trade, subsidies, and semiconductors dates to the late twentieth century, when Japanese producers were supplanting the dominant global

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<sup>23</sup> European Commission, 'Explanatory Memorandum: Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act)' COM (2022) 45 final, pg. 12.

<sup>24</sup> European Commission, 'Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act)' COM (2022) 45 final, Arts. 9 & 32.

position long held by American firms.<sup>25</sup> This canon predates the creation of current international law on trade and subsidies, in the form of the SCM Agreement. In the absence of more contemporary literature, the study relies extensively on primary sources and official publications of the European Commission, as well as private industry reports and research produced by international non-governmental organizations.

Many of the statistics and figures referenced in the study rely on estimates. The complexity of the semiconductor industry, with various stages of research, manufacturing, and distribution involving several thousand entities spread across different jurisdictions, undermines commonly agreed statistical groupings or definitions. Even in the EU, the difficulty of grouping together members of the industry is manifested in the structure of its representative association: the European Electronic Component Manufacturers Association is subdivided into two autonomous industry associations.<sup>26</sup> Furthermore, data on subsidies is inherently limited and governments often obfuscate subsidy measures to make them more difficult to identify and dispute.

The study is agnostic to the current impasse affecting the Appellate Body. Although a scenario involving dispute of support to the domestic semiconductor industry in the EU could be referred for appeal according to the Understanding on Rules and Procedures Governing the Settlement of Disputes, the Appellate Body is incapable of hearing new cases until current vacancies are filled.<sup>27</sup> In 2020, an alternative Multiparty Interim Appeal Arbitration Arrangement was established as a workaround to the WTO Appellate Body, however among the major economies involved in the semiconductor supply chain, only the EU and China are participating in this plurilateral initiative.<sup>28</sup>

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<sup>25</sup> Douglas A. Irwin, 'Trade Politics and the Semiconductor Industry' (1994) National Bureau of Economic Research Working Paper No 4745.

<sup>26</sup> 'EECA | Eusemiconductors' <<https://www.eusemiconductors.eu/eeca>> accessed 22 May 2022.

<sup>27</sup> According to the European Parliamentary Research Service, around two-thirds of DSB reports are appealed, Jana Titievskaia, 'Briefing - International Trade Dispute Settlement: WTO Appellate Body Crisis and the Multiparty Interim Appeal Arrangement' (European Parliamentary Research Service 2021) PE 690.521 <[https://www.europarl.europa.eu/thinktank/en/document/EPRS\\_BRI\(2021\)690521](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2021)690521)>, pg. 2.

<sup>28</sup> Ibid, pg. 5.

## 2. EU Legislation in support of the Semiconductors Industry

### 2.1 Europe's Position in a Global Market

The EU's position in international supply chains for semiconductors is unique among industrialized economies. European firms are important suppliers of capital goods necessary to fabricate semiconductors. Many research and technology organizations (RTOs) in the EU are at the leading edge of R&D and, together with the US, contribute to the “highest conversion of from patents filed into triadic patents—typically regarded as a marker of high-quality innovation with global commercial potential”.<sup>29</sup> Despite this, Europe is underrepresented in terms of global semiconductor market share—especially in the production of the most high-end, advanced technologies.

The prevailing business model in the semiconductor industry dictates that, even for technologies relying on European capital goods and R&D, manufacturing processes are exported to markets where there are lower production costs and established economies of scale. By most estimates, more than two-thirds of semiconductors manufacturing by value takes place in east Asia, with very strong industry concentration for the most advanced products in South Korea and Taiwan.<sup>30</sup>

The Chips Act for Europe is part of an array of initiatives by the EU to improve the position of domestic RTOs and manufacturers in global markets, with the general objective of creating a “[Chips for Europe] Initiative...to support large-scale technological capacity building and innovation throughout the Union to enable development and deployment of cutting-edge and next generation semiconductor and quantum technologies that will reinforce the Union advanced design, systems

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<sup>29</sup> Varas Antonio and others, ‘Strengthening the Global Semiconductor Supply Chain in an Uncertain Era’ (Boston Consulting Group & Semiconductor Industry Association 2021) <<https://www.bcg.com/publications/2021/strengthening-the-global-semiconductor-supply-chain>> accessed 12 May 2022, pg. 32.

<sup>30</sup> Ibid, pg. 11.

integration and chips production capabilities”.<sup>31</sup> Articles 173 and 179 through 190 of the Treaty on the Functioning of the European Union (TFEU) establish the role of the EU in facilitating industrial competitiveness and R&D.<sup>32</sup>

In presenting the initiative, the European Commission has situated the Chips Act for Europe within the frame of the Europe’s Digital Decade targets, most notably the ambition to, “double [the] EU share in global production [of Cutting edge Semiconductors]”.<sup>33</sup> The Digital Decade vision also articulates the objective of increasing the “security and resilience” of the EU’s digital supply chains, including for semiconductors.<sup>34</sup>

Government support for the semiconductor industry is widespread and not exclusive to Europe. In fact, European support for the semiconductor industry has come at a relatively late stage compared to other industrialized economies. China, Japan, South Korea, Taiwan, and the US have all set out their own initiatives to stimulate semiconductor research and manufacturing.<sup>35</sup>

*Table 1) Measures announced to support domestic semiconductor industries in the EU & peer countries*

	<b>Announced Measures (€ billion)</b>	<b>Comments</b>
<b>EU</b>	11	Combining 3.3€ billion proposed under the draft Chips Act Regulation with new Chips Joint Undertaking and existing allocations until 2027

<sup>31</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Art. 4.

<sup>32</sup> Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C326, Arts. 173, 179-190.

<sup>33</sup> European Commission, ‘Europe’s Digital Decade: Digital Targets for 2030’ <[https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en)> accessed 16 May 2022.

<sup>34</sup> Ibid.

<sup>35</sup> In respective order: China, Karen M. Sutter, ‘China’s New Semiconductor Policies: Issues for Congress’ (Congressional Research Service 2021) R46767 <https://crsreports.congress.gov/product/pdf/R/R46767>, pgs. 3-10; ‘Japan Approves \$6.8 Billion Boost for Domestic Chip Industry’ Bloomberg.com (26 November 2021) <<https://www.bloomberg.com/news/articles/2021-11-26/japan-approves-6-8-billion-boost-for-domestic-chip-industry>> accessed 21 May 2022; South Korea, Sam Shead, ‘Governments Are Deploying “wartime-like” Efforts to Win the Global Semiconductor Race’ (CNBC, 17 May 2021) <<https://www.cnbc.com/2021/05/17/semiconductors-nations-deploy-wartime-like-efforts-to-win-chip-race.html>> accessed 21 May 2022; Taiwan, News T, ‘Taiwan Invests Big to Create Semiconductor Hub | Taiwan News | 2020-07-03 10:24:00’ (Taiwan News, 3 July 2020) <<https://www.taiwannews.com.tw/en/news/3957656>> accessed 16 May 2022; US, Michael T McCaul, Text - H.R.7178 - 116th Congress (2019-2020): CHIPS for America Act 2020 [H.R.7178], Sec. 3 (c).

<b>China</b>	170.6	Majority going to production capacities through China Integrated Circuit Investment Industry Fund with nominal targets for 2025
<b>Japan</b>	6.8	Funding approved for 2021-2022 fiscal year budget, mostly allocated to production capacity with a small share for R&D
<b>South Korea</b>	430	Includes private domestic investments worth 377€ million announced by Samsung and Hynix, 740€ million through the government’s K-Semiconductor Strategy—both by 2030—guaranteed water and power supplies for production facilities, and between 37%-47% tax deductions for semiconductor R&D and between 7%-17% tax deductions for investments in productions facilities
<b>Taiwan</b>	248	Unspecified timeline, however subsidies are oriented towards production capacities and intended to attract larger-scale private investment
<b>US</b>	50	Federal appropriation until 2025, not including state and local incentives

*Own compilation from public statements and available draft legislation*

Table 1 comprises an overview of currently announced measures. The allocations referenced above are in absolute terms and not weighted to the size of each economy. While the figures are not directly comparable—reflecting different timelines and varying formulae combining government and private financing—they are illustrative of the fact that all major economies have self-interested objectives when it comes to the future of the semiconductor industry, and the intervention proposed for the EU is comparatively modest.

## **2.2 Chips Act for Europe**

### **2.2.1 Context of the Initiative**

The primary component of the legislative package formally announced by the European Commission in February 2022 is the proposal for a Chips Act for Europe Regulation.<sup>36</sup> The proposed legislation is articulated as part of the European Commission’s 2030 Digital Compass Communication, which targets that, “the production of cutting-edge and sustainable semiconductors in Europe including processors [reaches] at least 20% of world production in value (meaning manufacturing capacities below 5nm nodes aiming at 2nm and 10 times more

<sup>36</sup> European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Chips Act for Europe’ COM (2022) 45 final.

energy efficient than today).”<sup>37</sup> The current share of semiconductors on the global market that are produced in the EU is estimated to be less than 10%.<sup>38</sup>

The strategy entails the allocation of public funds to stimulate R&D and production in the EU. At the time of announcement by the European Commission, a public investment of 11€ billion was indicated between 2022 and 2030.<sup>39</sup> If including public investments, leveraged equity support, and “crowding in” of private capital, the tally could be considered as high as 43€ billion by 2030, though most observers take this as a liberal interpretation of commitments.<sup>40</sup> Around 3.3€ billion can be specifically traced to the proposal for a Chips Act Regulation, with this funding to be derived from the Horizon Europe and Digital Europe programs.<sup>41</sup>

## 2.2.2 Unpackaging the Chips Act Proposal: Five Objectives

Reflecting the complexity of the semiconductors industry, the proposal is multifaceted. The stated objectives of the Chips Act proposal are to: (i) strengthen of European research and technology leadership; (ii) build European capacity to innovate in the design, manufacturing, and packaging of advanced chips; (iii) increase technology and engineering capacities for quantum chips; (iv) address the needs of a skilled workforce; and (v) develop an in-depth understanding of global semiconductor supply chains.<sup>42</sup> These objectives show the intended direction of funding, and are vital to understanding the standing of prospective subsidies relative to EU commitments under international law.

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<sup>37</sup> European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - 2030 Digital Compass: the European Way for the Digital Decade’ COM (2021) 118 final.

<sup>38</sup> Estimates range between 4% and 10%: ‘Chip Shortage: How the Semiconductor Industry Is Dealing with This Worldwide Problem’ (World Economic Forum) <<https://www.weforum.org/agenda/2022/02/semiconductor-chip-shortage-supply-chain/>> accessed 20 May 2022; Varas Antonio and others, ‘Strengthening the Global Semiconductor Supply Chain in an Uncertain Era’ (Boston Consulting Group & Semiconductor Industry Association 2021) <<https://www.bcg.com/publications/2021/strengthening-the-global-semiconductor-supply-chain>> accessed 12 May 2022, pg. 11; European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Chips Act for Europe’ COM (2022) 45 final..

<sup>39</sup> European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Chips Act for Europe’ COM (2022) 45 final, pg. 12.

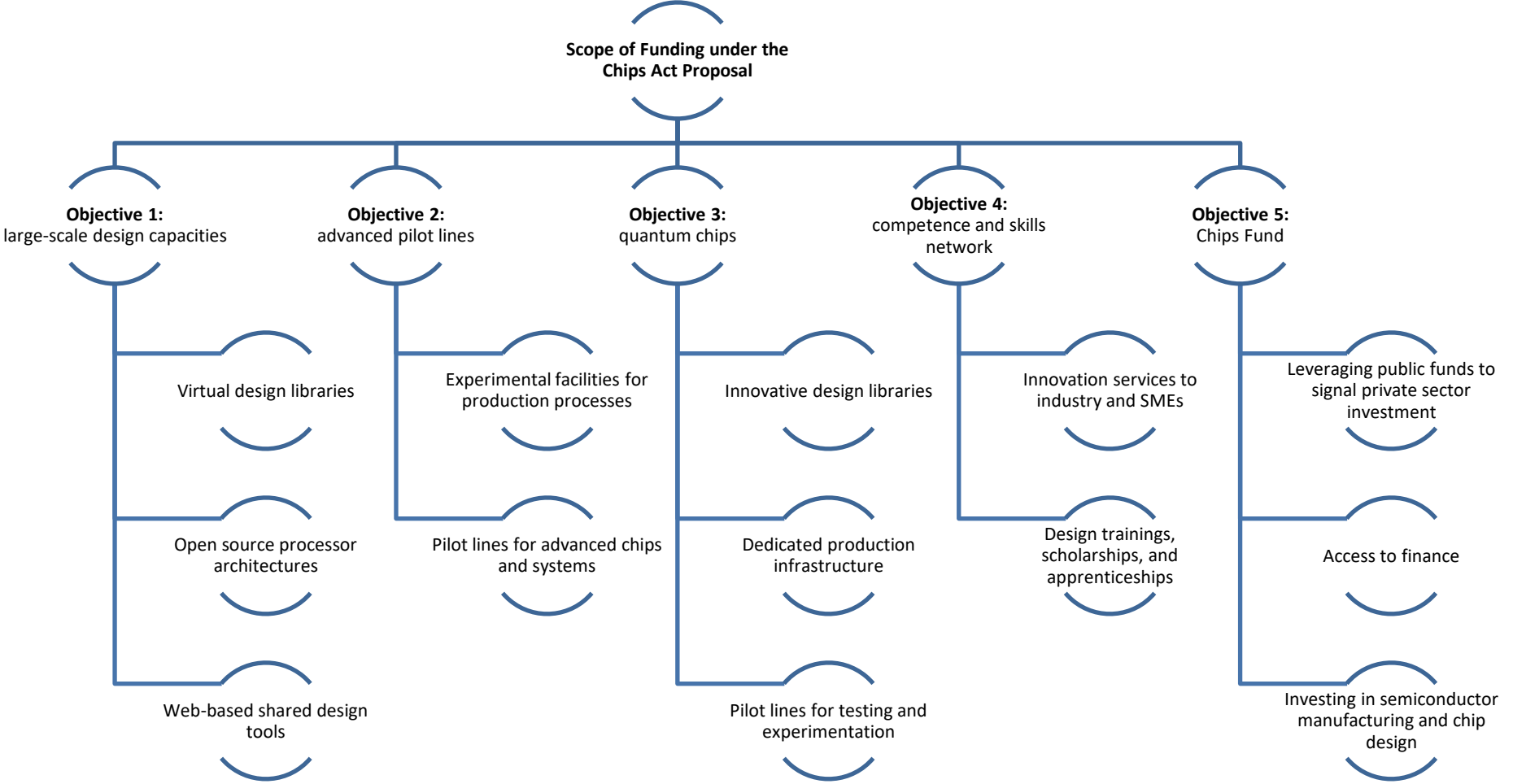
<sup>40</sup> Ibid, pg. 11.

<sup>41</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final.

<sup>42</sup> Ibid, Art. 4.



Figure 1) Components of the EU Chips Act Proposal



*Own compilation from draft Chips Act Regulation*

The first objective—design capacities for integrated semiconductor technologies—is essentially a horizontal information sharing and collaboration platform between firms and RTOs. The support provided is in the form of establishing a “virtual platform available across the Union” consisting of “new innovative design facilities with extended libraries and tools, integrating a large number of existing and new technologies (including emerging technologies such as integrated photonics, quantum and AI / neuromorphic).”<sup>43</sup>

The second objective entails the allocation of public funds for the creation of novel production, testing, and experimentation facilities—so-called “pilot lines.”<sup>44</sup> Pilot lines are defined as, “an experimental project or action addressing higher technology readiness levels...to further develop an enabling infrastructure necessary to test, demonstrate and calibrate a product or system with the model assumptions.”<sup>45</sup> The concept of pilot lines and the scope outlined in the annex to the Chips Act proposal skirt the boundary between R&D and production. Establishing pilot lines will inevitably require some level of subsidization to firms involved in semiconductors fabrication, and the proposal lacks articulation of a clear cut-off conditionality to prevent pre-commercial capacities from being absorbed into these manufacturing operations.

Quantum chips are a future frontier for semiconductor chips where much of the technology remains in the design phase. The third objective of the Chips Act proposal aims to alleviate some of the costs for firms and RTOs to develop quantum chip technology. The measures targeted under the objective are similar to those under the first and second objectives, but are specifically tailored to providing design library facilities, pilot lines, and testing and experimentation capacities that are attuned to the needs of quantum chips.

The fourth objective is squarely focused on the establishment of skills and competence centers. The aim is twofold, to: “(1) strengthen capacities and offer a wide range of expertise to the stakeholders, including end-user SMEs and start-ups,

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<sup>43</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Annex 1.

<sup>44</sup> Ibid.

<sup>45</sup> Ibid, Art. 2.

facilitating access to an effective use of the above capacities and facilities [Objectives One through Three]” and “(2) address the skills shortage, attracting and mobilizing new talent and supporting the emergence of a suitably skilled workforce for strengthening the semiconductor sector, including via reskilling and upskill of workers.”<sup>46</sup>

The fifth objective of the proposal engages the European Union in providing direct support to the semiconductor industry, in a form a “Chips Fund.”<sup>47</sup> This represents the most dramatic departure from the approach embodied under previous actions taken by the EU to promote the semiconductor industry, and perhaps also the most relevant in terms of overlapping with international subsidies disciplines. Earlier initiatives by the EU, such as the 2013 European Strategy for Micro- and Nanoelectronic Components and Systems, have centered on providing in-kind support to the industry, in the form of organizing industry collaboration platforms and information exchanges akin to what is proposed under the first four components of the Chips Act.<sup>48</sup> The lack of support outside of R&D initiatives has been cited as a shortcoming in earlier attempts by the EU to support the industry.<sup>49</sup>

Unlike earlier initiatives, the proposed Chips Fund is intended “to facilitate access to debt financing and equity by start-ups, scale-ups and SMEs and other companies in the semiconductor value chain, through a blending facility under the InvestEU Fund and via the European Innovation Council.”<sup>50</sup> Compared to the other objectives outlined above, the details regarding this fifth objective are noticeably sparse in the technical annex, suggesting a broad scope for the funding. The preamble to the proposed Regulation does however provide the following:

“The Commission should set-up a dedicated semiconductor investment facility support (as part of the investment facilitation activities described

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<sup>46</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, pgs. 38-39.

<sup>47</sup> Ibid, pg. 39.

<sup>48</sup> European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Strategy for Micro- and Nanoelectronic Components and Systems’ COM/2013/0298 final.

<sup>49</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Legislative Financial Statement Section 1.5.3.

<sup>50</sup> Ibid, pg. 39.

collectively as the ‘Chips Fund’) proposing both equity and debt solutions, including a blending facility under the InvestEU Fund established by Regulation (EU) 2021/523 of the European Parliament and Council, in close cooperation with the European Investment Bank Group and together with other implementing partners such as national promotional banks and institutions. The ‘Chips Fund’ activities should support the development of a dynamic and resilient semiconductor ecosystem by providing opportunities for increased availability of funds to support the growth of start-ups and SMEs as well as investments across the value chain, including for other companies in the semiconductor value chains. In this context, the European Innovation Council will provide further dedicated support through grants and equity investments to high risk, market creating innovators.”<sup>51</sup>

According to the European Commission, the majority of the 3.3€ allocated through the Chips Act proposal will go to the Chips Fund.<sup>52</sup>

### **2.2.3 Key Concepts and Institutional Arrangements under the Chips Act Proposal**

The proposal foresees implementation of the Chips Act and management of the funds to be allocated through two main entities. The first is through a public-private partnership, as outlined in Article 71 of the Financial Regulation.<sup>53</sup> Specifically, the Chips Act proposal refers to the creation of a European Chips Infrastructure Consortium (ECIC), a legal entity fulfilling the following characteristics: “one or more statutory seats...located on the territory of one or more Member States” and consisting “of at least three legal entities from at least three Member States.”<sup>54</sup> With

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<sup>51</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Preamble (12).

<sup>52</sup> European Commission, ‘Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Chips Act for Europe’ COM (2022) 45 final, pg. 12.

<sup>53</sup> Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 [2018] OJ L193, Art. 71.

<sup>54</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Art. 7.

regards to the role to be played by the ECIC, only the following is provided in the current draft of the legislation:

“The ECIC shall have substantial overall autonomy to lay down its membership, governance, funding, budget and modalities by which the respective financial contributions from members are called upon, voting rights and working methods. However, the organization, composition and working methods of the ECIC, including any amendments to the Statutes, shall be in accordance with and contribute to the aims and objectives of this Regulation and the Chips for Europe Initiative...”<sup>55</sup>

The second entity to be created under the Chips Act proposal is a Chips Joint Undertaking, and actually constitutes a repurposing of the already established Key Digital Technologies Joint Undertaking.<sup>56</sup> The legal basis for joint undertakings is found under Article 187 of the TFEU, which defines the concept as “necessary for the efficient execution of Union research, technological development and demonstration programs.”<sup>57</sup>

The remit of the Chips Joint Undertaking designated under Article 9 of the Chips Act proposal is more clearly defined than for the ECIC, and covers the implementation of the first four of the five objectives outlined in the previous section.<sup>58</sup> Notably, responsibility for the management of the Chips Fund component is not assigned to the Chips Joint Undertaking by the draft legislation. This is reaffirmed by the Legislative Financial Statement accompanying the proposal, suggesting that the Chips Fund component is to be under direct management by the European Commission.<sup>59</sup>

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<sup>55</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Art. 7.

<sup>56</sup> European Commission, ‘Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking’ COM (2022) 47 final.

<sup>57</sup> Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C326, Art. 187.

<sup>58</sup> *Ibid.*, Art. 9.

<sup>59</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Legislative Financial Statement Section 1.7.

Additional key concepts outlined in the legislative proposal that are explicitly relevant to the ambition to achieve security of supply are Integrated Production Facilities and Open EU Foundries. Integrated Production Facilities are defined as “first-of-a-kind semiconductor design and manufacturing facilities, including front-end or back-end, or both, in the Union that contribute to the security of supply for the internal market,” and, furthermore, fulfills a handful of qualification criteria that are notable in including a requirement that they are not “subject to the extraterritorial application of public service obligations of third countries that may undermine the undertaking’s ability to comply with [the obligation to fulfill priority related orders] set out in Article 21(1).”<sup>60</sup>

The requirements for fulfilling the definition of an Open EU Foundry are similar, with the concept defined as entities that are “first-of-a-kind front-end or back-end, or both, manufacturing facilities in the Union that offer production capacity to unrelated undertakings and thereby contribute to the security of supply for in the internal market.”<sup>61</sup> Like with the criteria referred to for the designation as an Integrated Production Facility, Open EU Foundries are also required to be free from obligations to third countries that could undermine supply to the EU market.<sup>62</sup>

The purpose of designating certain undertakings in the EU as Integrated Production Facilities and Open EU Foundries is primarily to facilitate fast-track access to pilot lines and experimental facilities to be established by the Chips Act proposal, as well as expediting permitting for the construction and operation of new facilities.<sup>63</sup>

Finally, the proposed Chips Act would see the establishment of a European Semiconductor Board. Under the proposed Regulation, the European Semiconductor Board will be responsible for overall governance and coordination of the initiative, with an emphasis on industry monitoring and crisis response. With regards to the allocation of funds under the Chips Act, the European Semiconductor

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<sup>60</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, Art. 10.

<sup>61</sup> Ibid, Art. 11.

<sup>62</sup> Ibid.

<sup>63</sup> Ibid, Arts. 10, 11 & 14.

Board's role appears limited and therefore, while it would represent a significant outcome of the legislation, it is not a primary focus of this study on subsidies.<sup>64</sup>

### **2.3 Chips Joint Undertaking**

Although based on separate legislation, the establishment of a Chips Joint Undertaking is fundamental to the proposed Chips Act Regulation. With the proposed legislation, the Chips Joint Undertaking is to be entrusted with the primary implementation of the Chips Act. The financial arrangements underpinning the Chips Joint Undertaking are therefore pertinent to assessing the applicable subsidies discipline.

The entities comprising the Chips Joint Undertaking—carried over (not amended) from the previous Key Digital Technologies Joint Undertaking are the following: the European Commission; the governments of the 27 Member States plus Iceland and Norway; and industrial associations from France, the Netherlands, and Germany.<sup>65</sup> Membership in the joint undertaking requires the entities indicated above to make budgetary contributions to the activities carried out. Under the proposed amendments to the Regulation, the EU's financial contribution will be significant, totaling 4.2€ billion.<sup>66</sup> The prospective budget allocated by the Chips Joint Undertaking draft legislation therefore exceeds the 3.3€ earmarked under the proposed Chips Act. Furthermore, the EU's contribution is to be matched by the Member States, Iceland, and Norway.<sup>67</sup> Private entities forming part of the joint undertaking are also obligated to contribute to covering the administrative costs of the Chips Joint Undertaking—at least 26.3€ million from the period of adoption of the legislation to 2031.<sup>68</sup>

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<sup>64</sup> European Commission, 'Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act)' COM (2022) 45 final, Art. 23.

<sup>65</sup> Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014 [2021] OJ L427, Art. 127.

<sup>66</sup> European Commission, 'Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking' COM (2022) 47 final, Art. 128.

<sup>67</sup> Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe and repealing Regulations (EC) No 219/2007, (EU) No 557/2014, (EU) No 558/2014, (EU) No 559/2014, (EU) No 560/2014, (EU) No 561/2014 and (EU) No 642/2014 [2021] OJ L427, Art. 129.

<sup>68</sup> European Commission, 'Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking' COM

The scope of implementation of the semiconductors initiative that would be entrusted to the Chips Joint Undertaking—further to what has been outlined herein under Section 2.2.3—is detailed in Table 2.

*Table 2) Activities & Constituent Entities of the Chips Joint Undertaking*

	Entity	Tasks
<b>Chips Joint Undertaking</b>	Governing Board	<ul style="list-style-type: none"> <li>• Approval of investments decisions and additional activities</li> </ul>
	Public Authorities Board	<ul style="list-style-type: none"> <li>• Input to Strategic Research and Innovation Agenda</li> <li>• Work program</li> <li>• Launch, review, and select calls for proposals</li> </ul>
	Private Members Board	<ul style="list-style-type: none"> <li>• Draft Strategic Research and Innovation Agenda</li> <li>• Stakeholder Forum</li> <li>• Propose new activities</li> </ul>

*Own compilation from legislation*

Notably, under the proposed amendments to Council Regulation (EU) 2021/2085, the 2.7€ billion to be drawn from the Horizon Europe program are “to provide financial support to indirect actions as defined in Article 2, point 43, of Regulation (EU) 2021/695, corresponding to the research and innovation activities of the Joint Undertaking.”<sup>69</sup> The remaining amount of 1.5€ billion drawn from the Digital Europe program is intended for “capacity building for pilot lines and design infrastructures across the whole Union.”<sup>70</sup>

## **2.4 Subsidy Implications of the Digital Europe and Horizon Europe Programs?**

As outlined above, the initiatives proposed under the Chips Act and Chips Joint Undertaking would draw their funding largely from the Digital Europe and Horizon Europe programs. The funding conditions stipulated by these programs therefore have bearing on whether the support constitutes a form of subsidization with obligations under international law.

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(2022) 47 final, Art. 129.; Regarding the duration of the Chips Joint Undertaking, this is determined on the basis of preamble paragraph (44) of Council Regulation (EU) 2021/2085.

<sup>69</sup> European Commission, ‘Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking’ COM (2022) 47 final, Art. 128; Referring to the following under Regulation (EU) 2021/695: “‘indirect actions’ means R&I activities to which the Union provides financial support and which are undertaken by participants.” Contrast with ‘direct actions’, defined under point 44 as “R&I activities undertaken by the Commission through its JRC.”

<sup>70</sup> Ibid, Art. 128.



Article 14 of Regulation (EU) 2021/694 details the implementation and forms of EU funding under the Digital Europe program. These include procurement, grants, and other awards, including so-called “blending operations” defined as, “non-repayable forms of support or financial instruments from the Union budget [combined] with repayable forms of support from development or other public finance institutions, as well as from commercial finance institutions and investors.”<sup>71</sup> Article 18 of the same Regulation establishes the eligibility criteria for legal entities to receive funding, with preferential conditions for domestic entities.<sup>72</sup>

The proposed Chips Act Regulation would add a sixth Specific Objective to the Digital Europe Program on Semiconductors, with “EUR 1 650 000 000 billion [sic]” in allocated funds until 2027.<sup>73</sup>

The Horizon Europe Program is the EU’s broad-ranging R&D support initiative. Like the Digital Europe program, the primary means of implementation of the funding are through grants, mutualized insurance, prize contests, procurements, and blended operations. Horizon Europe includes specialized schemes with criteria targeted to emerging technologies and SMEs, in the form of the Pathfinder and Accelerator initiatives, respectively.<sup>74</sup>

Regulation (EU) 2021/694 establishing the Horizon Europe program is supplemented by Council Regulation (EU) 2021/2085, establishing Joint Undertakings. The package of draft legislation comprising the Chips Act for Europe includes a proposal to amend Council Regulation (EU) 2021/2085 with the goal of creating a Chips Joint Undertaking.<sup>75</sup> Among the key features of the proposal are the stipulation of a minimum quota of SMEs participating and that they receive at

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<sup>71</sup> Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240 (Text with EEA relevance) [2021] OJ L166, Arts. 2 & 14.

<sup>72</sup> Ibid, Art. 18.

<sup>73</sup> European Commission, ‘Proposal for a Regulation of the European Parliament and of the Council establishing a framework of measures for strengthening Europe’s semiconductor ecosystem (Chips Act)’ COM (2022) 45 final, pg. 58.

<sup>74</sup> Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013 (Text with EEA relevance) [2021] OJ L170, Arts. 31-39, 43-48.

<sup>75</sup> European Commission, ‘Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking’ COM (2022) 47 final, pg. 14.

least 20% of public funding.<sup>76</sup> Overall, 4.2€ billion are proposed to be allocated to the Chips Joint Undertaking—funded from the Horizon Europe and Digital Europe programs—and the four objectives of the draft Chips Regulation that are research-oriented are reaffirmed.<sup>77</sup>

## 2.5 Summary of EU Support to the Semiconductors Industry

Sections 2.2 through 2.4 indicate that the array of measures proposed to support the domestic semiconductor industry in the EU include the enlistment of existing funding mechanisms. These include the Digital Europe and Horizon Europe programs, along with a repurposing of the Joint Undertaking Regulation, while also creating the legal imperative for new initiatives such as those outlined under the Chips Act proposal. A recapitulation of these different measures and their defining characteristics is beneficial, as it provides the basis for considering their legality under the SCM Agreement examined in Section 3.

Table 3) Overview of current & proposed support for the EU semiconductors industry

Type of Measure	Underlying Legislation	Status	Comments
<b>Grants</b>	Digital Europe	In force	<ul style="list-style-type: none"> <li>• Eligibility criteria (Arts. 17 &amp; 18) limited to legal entities in EU Member States or certain narrowly defined associated countries, subject to security exceptions in (Art. 12)</li> <li>• Award criteria (Art. 20)</li> </ul>
	Horizon Europe	In force	<ul style="list-style-type: none"> <li>• Eligibility criteria (Art. 22) and are open to entities established in non-EU countries</li> <li>• Award criteria (Art. 28)</li> <li>• Beneficiaries own results (Art. 38) and are entitled to exploit them (Art. 39)</li> </ul>
	Chips Joint Undertaking	Proposed	<ul style="list-style-type: none"> <li>• Amendment of the Key Digital Technologies Joint Undertaking (Art. 126)</li> </ul>
<b>Research Infrastructure,</b>	Digital Europe	In force	<ul style="list-style-type: none"> <li>• Creation of European Partnerships (Art. 15) and</li> </ul>

<sup>76</sup> European Commission, ‘Proposal for a Council Regulation amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking’ COM (2022) 47 final, pg. 15.

<sup>77</sup> Ibid, 15-16.

<b>Networks &amp; Open IP</b>			European Digital Innovation Hubs (Art. 16)
	Horizon Europe	In force	<ul style="list-style-type: none"> <li>• Creation of European Innovation Council (Art. 9) and European Partnerships (Art. 10)</li> </ul>
	Chips Act	Proposed	<ul style="list-style-type: none"> <li>• Creation of a European Chips Infrastructure Consortium (Art. 7) and European network of competence centers in semiconductors (Art. 8)</li> <li>• Establishment of open design tools and shared information resources (Art. 4)</li> <li>• Establishment of European Semiconductor Board (Art. 23)</li> </ul>
<b>Blended Investments</b>	Digital Europe	In force	<ul style="list-style-type: none"> <li>• Provided for (Art. 22) in the form of EU Guarantees towards risk coverage</li> </ul>
	Horizon Europe	In force	<ul style="list-style-type: none"> <li>• Provided for (Art. 45) through European Innovation Council, covering reimbursements (Art. 36) and mutual insurance mechanism (Art. 37)</li> </ul>
	Chips Act	Proposed	<ul style="list-style-type: none"> <li>• Creation of a Chips Fund (Arts. 4 &amp; 5) for debt financing and equity</li> </ul>
<b>Procurements</b>	Digital Europe	In force	<ul style="list-style-type: none"> <li>• Procurement as form of primary implementation (Art. 14) pursuant to EU Financial Regulation</li> </ul>
	Horizon Europe	In force	<ul style="list-style-type: none"> <li>• Includes pre-commercial procurement and public procurement of innovative solutions (Art. 44)</li> <li>• Rules on eligibility and procedure (Art. 26)</li> </ul>
	Chips Act	Proposed	<ul style="list-style-type: none"> <li>• Common purchasing as a response to supply chain crises (Art. 22)</li> </ul>
<b>Expedited Regulatory Approvals</b>	Chips Act	Proposed	<ul style="list-style-type: none"> <li>• Firms that meet the definition of Integrated Production Facilities (Art. 10) and Open EU Foundries (Art. 11) are eligible for national fast-tracking of permit granting procedures (Art. 14)</li> </ul>

*Own compilation from legislation and draft legislation*



# 3. WTO Agreement on Subsidies and Countervailing Measures

## 3.1 Content of the SCM Agreement

The General Agreement on Tariffs and Trade (GATT) included some commitments on subsidies, however the primary focus of the agreement was the reduction of tariffs. Given the success of this, observers have noted that protectionism which would have otherwise been expressed as tariffs has increasingly taken the form of subsidies.<sup>78</sup> With the WTO, the SCM Agreement was concluded to establish common rules for government support to domestic industries among the Members.

Part I of the SCM Agreement outlines the General Provisions including Definition of a Subsidy (Article 1) and Specificity (Article 2). The definition acts as a test, where a subsidy “shall be deemed to exist if... (a)(1) there is a financial contribution by a government or any public body... or (a)(2) there is any form of income or price support in the sense of Article XVI of GATT 1994... and (b) a benefit is thereby conferred.”<sup>79</sup> The SCM Agreement is therefore an important complement to the GATT. Article XVI of the GATT 1947 outlines the original prohibition of subsidies going towards the export of primary products, along with introducing the obligation of Members to notify subsidies having an effect on trade.<sup>80</sup> Article VI enables Members to enact countervailing duties in instances where they are able to determine that subsidization in another Member “is such as to cause or threaten material injury to an established domestic industry, or is such as to retard materially the establishment of a domestic industry.”<sup>81</sup>

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<sup>78</sup> Simon Lester, Bryan Mercurio and Arwel Davies, *World Trade Law: Text, Materials and Commentary* (3rd edn, 2018), pg. 449.

<sup>79</sup> Agreement on Subsidies and Countervailing Measures [1994].

<sup>80</sup> The General Agreement on Tariffs and Trade [1947], Art. XVI.

<sup>81</sup> *Ibid*, Art. VI.

## 3.2 Specific Subsidies

The above is contingent on establishing whether the subsidies in question are specific. As the matter pertains to the WTO and international trade, it follows that the only subsidies that are in scope are those which have an adverse impact on trade.<sup>82</sup> WTO Members are free to intervene within their domestic economies insofar as they do not distort the competitive positioning of firms in other Members. This is where the matter of whether a subsidy is specific enters into consideration.

Subsidies are determined to be specific to “an enterprise or industry or group of enterprises or industries (...’certain enterprises’)” if they are explicitly granted to certain enterprises while limited to others. Subsidies that are granted on the basis of “objective criteria or conditions governing the eligibility for, and the amount of, a subsidy” are determined *prima facie* not to be specific.<sup>83</sup> Objective criteria are defined in the context of the SCM Agreement as those that “are neutral, which do not favor certain enterprises over others, and which are economic in nature and horizontal in application, such as number of employees or size of enterprise.”<sup>84</sup>

## 3.3 SCM Agreement Subsidy Tiers

The SCM Agreement goes on to denominate three types of subsidies: Prohibited (Part II); Actionable (Part III); and Non-Actionable (Part IV). Since adoption of the SCM Agreement and in accordance with Article 31, the non-actionable categorization has lapsed and is no longer applicable.<sup>85</sup> Different constraints and obligations apply to WTO Members for each.

### 3.3.1 Prohibited Subsidies (Part II)

Prohibited subsidies are defined as those that are “contingent, in law or in fact...upon export performance” or are “contingent...upon the use of domestic over imported goods.”<sup>86</sup> These subsidies—as their categorization suggests—are banned

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<sup>82</sup> Marc Benitah, *The Law of Subsidies under the GATT/WTO System* (Kluwer Law International 2001), pgs. 11-12.

<sup>83</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 2.

<sup>84</sup> *Ibid.*

<sup>85</sup> *Ibid.*, Art. 31; World Trade Organization, ‘World Trade Report 2021’ (World Trade Organization) [https://www.wto.org/english/res\\_e/booksp\\_e/wtr21\\_e/00\\_wtr21\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/wtr21_e/00_wtr21_e.pdf), pg. 174.

<sup>86</sup> Agreement on Subsidies and Countervailing Measures [1994], Art 3.

outright and are subject to an extensive remedies procedure outlined under Article 4 of the SCM Agreement.<sup>87</sup>

Following notable DSB cases, the existence of prohibited subsidies has been interpreted to go beyond what is reflected in the statutory provisions of a Member. Notably, for sectors that constitute a significant share of a Member's export economy, the provision of specific subsidies can be precarious from a legal perspective as the DSB has interpreted *de facto* export subsidies in cases, examined further in Section 3.4.

### **3.3.2 Actionable Subsidies (Part III)**

Actionable Subsidies follow a more complex definition than for Prohibited Subsidies under the SCM Agreement. To determine whether specific subsidies are Actionable, it must first be established that they have adverse effects, in the form of “(a) injury to the domestic industry of another Member; (b) nullification or impairment of benefits accruing directly or indirectly to other Members under GATT 1994 in particular the benefits of concessions bound under Article II of GATT 1994; [and] (c) serious prejudice to the interests of another Member.”<sup>88</sup> The latter condition is further defined as a situation where the subsidy exists either to cover more than 5% of the product's valuation, to cover an industry's operating losses, or to cover the operating losses of an enterprise on a recurring basis, or to provide direct forgiveness of debt.<sup>89</sup>

Furthermore, there are a series of circumstances where serious prejudice caused by a subsidy may be deemed to exist, namely where:

“(a) the effect of the subsidy is to displace or impede the imports of a like product of another Member into the market of the subsidizing Member; (b) the effect of the subsidy is to displace or impede the exports of a like product of another Member from a third country market; (c) the effect of the subsidy is a significant price undercutting by the subsidized product as compared with the price of a like product of another Member in the same market; [or] (d) the effect of the

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<sup>87</sup> Agreement on Subsidies and Countervailing Measures [1994], Art 4.

<sup>88</sup> *Ibid*, Art. 5.

<sup>89</sup> *Ibid*, Arts. 5-7.

subsidy is an increase in the world market share of the subsidizing Member in a particular subsidized primary product or commodity as compared to the average share it had during the previous period of three years and this increase follows a consistent trend over a period when subsidies have been granted.”<sup>90</sup>

Actionable Subsidies are subject to Dispute Settlement in the event of a complaint, in accordance with Articles 7 and 30 of the SCM Agreement.<sup>91</sup>

### **3.3.3 Non-Actionable Subsidies (Part IV)**

Under the third category, Non-Actionable Subsidies were defined as those that are either determined not to be specific under Part I of the SCM Agreement or meet the specificity criteria but fall within the scope of permissible support for research activities. As these subsidies were permitted under WTO law—other Members do not have a right of “action” against them—there are, not surprisingly, complex criteria that accompany these provisions. Article 31 of the SCM Agreement on Non-Actionable Subsidies established a duration of five years and were not renewed, nor were any such measures notified by WTO Members under Article 8.3.<sup>92</sup>

The criteria on Non-Actionable subsidies in the SCM Agreement allowed for subsidies to be provided “for research activities conducted by firms or by higher education or research establishments on a contract basis with firms,” provided that the following conditions were met: (a) the support is not greater than 75% of the costs of industrial research or 50% of “pre-competitive development activity<sup>93</sup>”; and (b) it is used solely for covering the costs of personnel, equipment and facilities, consultancy and technical services, overhead, and other running costs “incurred directly as a result of the research activity.”<sup>94</sup>

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<sup>90</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 6.

<sup>91</sup> Ibid, Arts. 7 & 30.

<sup>92</sup> Ibid, Art. 31 & 8.3.

<sup>93</sup> Ibid, Art. 8: Defined as “the translation of industrial research findings into a plan, blueprint or design for new, modified or improved products, processes or services whether intended for sale or use, including the creation of a first prototype which would not be capable of commercial use. It may further include the conceptual formulation and design of products, processes or services alternatives and initial demonstration or pilot projects, provided that these same projects cannot be converted for industrial application or commercial exploitation. It does not include routine or periodic alterations to existing products, production lines, manufacturing processes, services, and other on-going operations even though those alterations may represent improvements.”

<sup>94</sup> Ibid, Art. 8.



Apart from research-oriented subsidies fulfilling the conditions above, two additional sub-categories existed under Part IV of the SCM Agreement. Subsidies could have been deemed Non-Actionable if they were part of a regional development framework or comprised “assistance to promote adaptation of existing facilities to new environmental requirements imposed by law.”<sup>95</sup>

Prior to lapsing in 1999, the Non-Actionable subsidies category was never claimed by any WTO Members as a defense during a trade dispute.<sup>96</sup>

### **3.4 Semiconductor Trade Disputes & DSB Cases**

Tensions in trade relations over semiconductors predate the establishment of the WTO. During the 1980s, the incumbent semiconductor industry in the US successfully lobbied for government protection from lower-priced Japanese imports. The resulting Semiconductor Trade Agreement of 1986 led the government of Japan to voluntarily restrain exports and work towards setting conditions where foreign semiconductor manufacturers would eventually attain 20% of its domestic market share.<sup>97</sup> The initial anti-dumping investigation launched by the US government was later found to be inconsistent with the GATT, but the episode shows the extraordinary sensitivity of governments seeking to manage this strategic sector from its early commercialization.<sup>98</sup>

#### **3.4.1 Dynamic Random Access Memory Semiconductor (DRAMs) Disputes – The Hynix Semiconductor Saga**

Soon after the creation of the WTO, the government of South Korea requested consultations with the US regarding anti-dumping duties on DRAMS. The complaint, which would become DS99, centered around the US Department of Commerce’s determination of dumping of semiconductors by South Korean manufacturers on the US market.<sup>99</sup> The dispute did not allege that dumping by

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<sup>95</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 8.

<sup>96</sup> ‘Report to the Congress: Review and Operation of the WTO Subsidies Agreement - Report of the US Department of Commerce’ (1999) <<https://enforcement.trade.gov/esel/reports/scm0699/scm-0699.htm>> accessed 13 May 2022.

<sup>97</sup> Douglas Irwin, ‘The US-Japan Semiconductor Trade Conflict’ (1996) *The Political Economy of Trade Protection* National Bureau of Economic Research <<http://www.nber.org/chapters/c8717>>, pg. 5.

<sup>98</sup> Ibid.

<sup>99</sup> World Trade Organization, ‘United States - Anti-Dumping Duty on Dynamic Random Access Memory Semiconductors (DRAMs) of One Megabyte or above From Korea: Request for Establishment of a Panel by Korea’ (World Trade Organization 1997) WT/DS99/2 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds99\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds99_e.htm)>.

Korean manufacturers was motivated by domestic subsidies. A mutually agreed solution was notified in October 2000.<sup>100</sup>

Table 4) Overview of DRAMS WTO Disputes

Case Number	Claimant	Respondent	Dates	Key Issues in the Dispute <sup>101</sup>
DS99	South Korea	US	1997 – 2000	<ul style="list-style-type: none"> <li>• Anti-dumping duties</li> </ul>
DS296		US	2003 – 2005	<ul style="list-style-type: none"> <li>• Entrustment &amp; direction</li> <li>• Conferral of benefit</li> <li>• Specificity</li> <li>• Injury to domestic industry</li> </ul>
DS299		EU	2003 – 2005	<ul style="list-style-type: none"> <li>• Financial contribution</li> <li>• Entrustment &amp; direction</li> <li>• Conferral of benefit</li> <li>• Specificity</li> <li>• Methodology for determining causality &amp; injury to domestic industry</li> </ul>
DS336		Japan	2006 – 2008	<ul style="list-style-type: none"> <li>• Entrustment &amp; direction</li> <li>• Methodology for determining causality &amp; injury to domestic industry</li> </ul>

*Author's compilation from WTO database*

Despite this, South Korea initiated a second dispute over countervailing duties on semiconductors in 2003. In DS296, the DSB and ultimately the Appellate Body considered at length the determination by US authorities that South Korean firms were receiving subsidies. The underlying issue disputed by the South Korean government was a determination by the US Department of Commerce that South Korean firms benefited from public financial contributions, that these firms were subject to control by the South Korean government, and that a particular firm—Hynix Semiconductor—received access to credit better than would be available on the private market.<sup>102</sup>

<sup>100</sup> World Trade Organization, 'DS99: United States - Anti-Dumping Duty on Dynamic Random Access Memory Semiconductors (DRAMS) of One Megabit or Above from Korea' <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds99\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds99_e.htm)> accessed 24 May 2022.

<sup>101</sup> Interpreted as key for their implications with respect to proposed EU subsidies.

<sup>102</sup> World Trade Organization, 'United States - Countervailing Duty Investigation on Dynamic Random Access Memory Semiconductors (DRAMS) from Korea: Request for the Establishment of a Panel by Korea' (World

Hynix was a firm in distress. The government of South Korea intervened on its behalf, seeking to prevent its collapse. In response, the US Department of Commerce applied countervailing duties on imports of DRAMS from South Korea, after having determined that that the South Korean government’s shares in banks offering credit in exchange for restructuring of Hynix compelled them to offer terms better than would have otherwise been available through the private market.<sup>103</sup> The US Department of Commerce contended that this represented a violation of Article 1.1 (a) (1) (iv) of the SCM Agreement—effectively “entrusting” or “directing” a private body to carry out the subsidization.<sup>104</sup>

In its DS296 report, the DSB panel found that the influence exerted by the government of South Korea over credit institutions in which it held shares and the “signaling” effect to other creditors on the market did not constitute entrustment or direction under the definition of Article 1.1 (a) (1) (iv).<sup>105</sup> The reasoning behind the US Department of Commerce’s decision to apply countervailing duties on the basis of benefit and specificity of the measures by the South Korean government were therefore also flawed.<sup>106</sup> The DSB panel found that in order to meet the definition of entrustment and direction under the SCM Agreement, the US Department of Commerce would need to have demonstrated that the government of South Korea exercised “delegation” or “command” over Hynix’s creditors.<sup>107</sup>

Whereas the DSB panel interpreted the question of entrustment and direction narrowly, on review the Appellate Body took the broader view that triggering the entrustment or direction definition under Article 1.1 (a) (1) (iv) of the SCM Agreement did not require demonstrating an act of delegation or command.<sup>108</sup> As a result, the Appellate Body reversed several of the DSB panel’s findings, ruling that the US Department of Commerce did act in accordance with the SCM Agreement

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Trade Organization 2003) WT/DS296/2  
 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds296\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds296_e.htm)>.

<sup>103</sup> World Trade Organization, ‘United States - Countervailing Duty Investigation on Dynamic Random Access Memory Semiconductors (DRAMS) from Korea: Request for the Establishment of a Panel by Korea’ (World Trade Organization 2003) WT/DS296/2 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds296\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds296_e.htm)>, pg. 19.

<sup>104</sup> Ibid.

<sup>105</sup> Ibid.

<sup>106</sup> Ibid, pg. 58 - 62.

<sup>107</sup> World Trade Organization, ‘US - Countervailing Duty Investigation on DRAMS (DS296)’ (World Trade Organization) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/1pagesum\\_e/ds296sum\\_e.pdf](https://www.wto.org/english/tratop_e/dispu_e/cases_e/1pagesum_e/ds296sum_e.pdf)>.

<sup>108</sup> Ibid.

in determining that indirect ownership of private credit institutions by the government of South Korea fit the definition of a subsidy under Article 1.1 (a) (1) (iv), and that the subsequent decisions on specificity and benefit were therefore valid.<sup>109</sup>

The EU has also found itself as the respondent to disputes initiated by South Korea for countervailing duties it has applied to semiconductor imports. In DS299, the South Korean government claimed that provisional countervailing duties applied by the EU on imported DRAMS were inconsistent with its commitments under the SCM Agreement.<sup>110</sup> The underlying issue again centered on the South Korean government's policy of intervention to prevent the collapse of Hynix Semiconductor. Like with the US Department of Commerce in DS296, "the [European Commission] determined that, from December 2000 through November 2001, Korea extended subsidies to Hynix, either through the provision of a financial contribution by its public bodies or by directing private bodies to take part in benefit to Hynix and thus constituted subsidies in the sense of the SCM Agreement."<sup>111</sup> In DS299, South Korea challenged both the determination that a subsidy existed by the European Commission, as well as the finding that measures it had taken in support of Hynix Semiconductors were injurious to the domestic semiconductor industry of the EU.<sup>112</sup>

Like DS296, DS299 also considered at length whether the South Korean government entrusted or directed private entities to intervene in providing financial support to Hynix Semiconductor that they would not have otherwise undertaken. The DSB panel in DS299 noted that a private entity taking actions contrary to what market discipline would hold could indicate of government entrustment or direction under Article 1.1 (a) (1) (iv) of the SCM Agreement, however this observation alone

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<sup>109</sup> World Trade Organization, 'United States - Countervailing Duty Investigation on Dynamic Random Access Memory Semiconductors (DRAMS) from Korea' (World Trade Organization 2005) WT/DS296/AB/R <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds296\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds296_e.htm)>, pg. 80.

<sup>110</sup> World Trade Organization, 'European Communities - Countervailing Measures on Dynamic Random Access Memory Chips from Korea: Request for the Establishment of a Panel by Korea' (World Trade Organization) WT/DS299/2 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds299\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds299_e.htm)>.

<sup>111</sup> World Trade Organization, 'European Communities - Countervailing Measures on Dynamic Random Access Memory Chips from Korea (WT/DS299): Report of the Panel' (World Trade Organization 2005) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds299\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds299_e.htm)>, pg. 8.

<sup>112</sup> Ibid.

did not constitute sufficient evidence to countervail the measure.<sup>113</sup> The DSB panel also found that the European Commission provided South Korean credit institutions participating in the bailout of Hynix with the opportunity to submit further information with a view to distinguishing them from the government—isolating the existence of entrustment or direction—and that they did not receive such information. Therefore, the grounds for determination of a subsidy under Article 1.1 (a) (1) (iv) were justified, with the exception of one of the alleged subsidy programs where the DSB panel found that the mere presence of government representatives at Hynix creditors meetings did not constitute a violation of the SCM Agreement.<sup>114</sup>

The DSB panel ruling in DS299 also clarified several other concepts key to the application of the SCM Agreement. Among these, the European Commission’s determination that subsidies provided by the government of South Korea conferred a benefit was examined by the DSB panel in DS299. The panel noted that:

“the parties...agree on the principle that the market place is the appropriate basis for comparison [to determine conferral of benefit]. However, Korea is arguing: (1) that the [European Commission] failed to use the available market benchmark in Korea to assess whether a benefit was conferred on Hynix...; and (2) that the [European Commission] ignored the real nature of the financial contributions as loans or loan guarantees and simply treated all alleged financial contributions as grants.”

The DSB panel considered the declining credit worthiness ratings given to Hynix by Korean and international agencies, as well as the observation that prior to the 1998 financial crisis which triggered Hynix’s instability, the firm was able to attract investments from foreign banks. However, following this, no new foreign investments were noted and Hynix had an outstanding debt of around 28€ million.<sup>115</sup> Against these circumstances, the DSB panel found that the European

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<sup>113</sup> World Trade Organization, ‘European Communities - Countervailing Measures on Dynamic Random Access Memory Chips from Korea (WT/DS299): Report of the Panel’ (World Trade Organization 2005) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds299\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds299_e.htm)>, pg. 22.

<sup>114</sup> Ibid, 48; World Trade Organization, ‘EC - Countervailing Measures on DRAM Chips (DS299)’ (World Trade Organization) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/1pagesum\\_e/ds299sum\\_e.pdf](https://www.wto.org/english/tratop_e/dispu_e/cases_e/1pagesum_e/ds299sum_e.pdf)>.

<sup>115</sup> World Trade Organization, ‘European Communities - Countervailing Measures on Dynamic Random Access Memory Chips from Korea (WT/DS299): Report of the Panel’ (World Trade Organization 2005) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds299\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds299_e.htm)>, pgs. 65-66.

Commission was justified in determining that new investments received by Hynix from creditors wherein the government of South Korea held a sizeable ownership stake conferred a benefit, because the private market had otherwise abstained.<sup>116</sup>

The DSB panel in DS299 also considered South Korea's claim that the European Commission incorrectly determined the subsidies provided to be specific, therefore falling under Article 2 of the SCM Agreement. The European Commission determined that, because one of the subsidy programs was used by only "six out of a potential of more than 200 eligible companies" and because Hynix used more than 41% of the available funds, the measure was *de facto* specific under the SCM Agreement.<sup>117</sup> A valid finding of specificity is important as one of the requisite criteria for countervailing measures.<sup>118</sup> Notably, the DSB panel ruled that this determination of specificity of the measure by the European Commission based on disproportionate use by a limited number of enterprises—despite the potential availability of the subsidy to a pool of more than 200 entities—was valid under Article 2 of the SCM Agreement.<sup>119</sup>

Finally, South Korea contended in DS299 that the European Commission's methodology for determining causality and injury of the subsidies was inconsistent with Article 15 of the SCM Agreement. Here, the DSB panel observed that, "it is noted that the DRAMS market is very transparent and characterized by substantial price competition. Indeed fixed costs are very high. Suppliers need to develop sufficient economies of scale and strive to maintain market shares."<sup>120</sup> The underlying nature of the semiconductor industry therefore renders it difficult to assess whether a supplier is undercutting the market and causing injury to domestic producers. The process for doing so is necessarily technical and complex. The DSB panel observed however that the SCM Agreement does not specify a methodology for determining causality and injury under Article 15.<sup>121</sup> In the absence of such, the European Commission's methodology for determining that subsidies received by

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<sup>116</sup> World Trade Organization, 'European Communities - Countervailing Measures on Dynamic Random Access Memory Chips from Korea (WT/DS299): Report of the Panel' (World Trade Organization 2005) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds299\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds299_e.htm)>, pgs. 65-66.

<sup>117</sup> Ibid, pg. 68.

<sup>118</sup> Ibid, pg. 69.

<sup>119</sup> Ibid.

<sup>120</sup> Ibid, 98-99.

<sup>121</sup> Ibid.

Hynix allowed it to undercut domestic producers in the EU was deemed to be reasonable and not in violation of the SCM Agreement.<sup>122</sup>

No stranger to the imposition of countervailing duties abroad, Hynix and the subsidies it received were at the center of yet another dispute in 2006. South Korea—again the complainant—requested the formation of a DSB panel after consultations with Japan failed to resolve the issue in what would become DS336.<sup>123</sup> The case represented Japanese authorities' first instance of applying countervailing duties on foreign imported goods.<sup>124</sup> South Korea claimed that in doing so, the Japanese government committed several violations of its obligations under the SCM Agreement.

Like in DS299, the focus of the dispute centered on questions of entrustment or direction by South Korean authorities to private creditors (Article 1.1 (a) (1) (iv) of the SCM Agreement), the methodology for determining benefit applied by Japanese authorities, and whether the subsidies were attributable to injury caused to the domestic industry.<sup>125</sup> China, the EU, and the US also provided submissions to the panel during DS336.<sup>126</sup>

The first question addressed by the panel in DS336 considered whether Japan's determination that announcements by the South Korean government of a policy to avert the collapse of Hynix could in fact be construed as evidence of entrustment or direction.<sup>127</sup> Japanese authorities reasoned that the policy announcement explained behavior by South Korean creditors that was not otherwise rational in a market

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<sup>122</sup> World Trade Organization, 'European Communities - Countervailing Measures on Dynamic Random Access Memory Chips from Korea (WT/DS299): Report of the Panel' (World Trade Organization 2005) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds299\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds299_e.htm)>, pgs. 98-99.

<sup>123</sup> World Trade Organization, 'Japan - Countervailing Duties on Dynamic Random Access Memories from Korea' (World Trade Organization 2006) WT/DS336/5 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds336\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds336_e.htm)>.

<sup>124</sup> Yeung J Cho, 'Japan's First CVDs Determination: With Particular Emphasis on the Issue of Direction and Entrustment' (2009) 43 *Journal of World Trade* 417.

<sup>125</sup> World Trade Organization, 'Japan - DRAMS (Korea) (DS336)' (World Trade Organization) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/1pagesum\\_e/ds336sum\\_e.pdf](https://www.wto.org/english/tratop_e/dispu_e/cases_e/1pagesum_e/ds336sum_e.pdf)>.

<sup>126</sup> World Trade Organization, 'Japan - Countervailing Duties on Dynamic Random Access Memories from Korea: Report of the Panel' (World Trade Organization 2007) WT/DS336/R <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds336\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds336_e.htm)>.

<sup>127</sup> *Ibid.*, 99-117.

context.<sup>128</sup> South Korea argued however that Japan's determination did not take into account the prospective longer term gains from equity received by creditors.<sup>129</sup>

The findings of the DSB panel in DS336 were mixed. Hynix underwent several rounds of restructuring, receiving both public and private capital along the way. For some of these rounds, the DSB panel rejected South Korea's claim that Japanese authorities had improperly determined entrustment and direction, benefit, and injury as a result of the subsidies, while for other rounds the opposite ruling was made.<sup>130</sup> As with DS296, the Appellate Body interpreted entrustment and direction to include a broader range of actions by government than the DSB panel, finding that Japanese authorities had acted in accordance with the SCM Agreement in this regard.<sup>131</sup> Furthermore, the Appellate Body reversed the DSB panel's finding that Japanese authorities violated Article 14 of the SCM Agreement, lowering the methodological standard for determining injury.<sup>132</sup> The effect of this latter ruling is similar to the DSB panel's analysis in DS299, in which the reasonableness of the methodology applied by the European Commission was considered in the absence of specific requirements established by the SCM Agreement.

### **3.4.2 Comparison with the Trade Disputes & DSB Cases concerning Commercial Aircraft**

The series of DRAMS dispute settlement cases reveal that contention in the global market for semiconductors is longstanding and entrenched. At the time, Hynix was a leader in the DRAMS market and it remains a national champion of South Korean industry. The South Korean government's intervention to prop up this incumbency following the 1998 financial crisis prompted countervailing measures to be taken by authorities in the US, EU, and Japan. In contrast to the DRAMS disputes, this section considers the case law established as a result of subsidies to aircraft manufacturers. This comparison is beneficial, as the subsidies at issue do not relate

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<sup>128</sup> World Trade Organization, 'Japan - Countervailing Duties on Dynamic Random Access Memories from Korea: Report of the Panel' (World Trade Organization 2007) WT/DS336/R <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds336\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds336_e.htm)>, pgs. 99-117.

<sup>129</sup> Ibid.

<sup>130</sup> Ibid, 202.

<sup>131</sup> World Trade Organization, 'Japan - Countervailing Duties on Dynamic Random Access Memories from Korea' (World Trade Organization 2007) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds336\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds336_e.htm)>.

<sup>132</sup> Ibid, 94.



to the financial restructuring of a single firm, but rather pertain to the research-intensive nature of developing and manufacturing complex commercial aircraft.

The proposal to enact support to the semiconductor industry in Europe exhibits strong parallels to the commercial aircraft sector, which has been the subject of longstanding trade disputes predating the creation of the WTO, and also leading to attempts to address the underlying issues through a form of *lex specialis*.<sup>133</sup> The civil aviation industry is marked by many of the same characteristics common to semiconductor firms and RTOs. Consider the following description excerpted from a study on the WTO legality of R&D subsidies in the landmark Airbus and Boeing disputes:

“the aircraft industry has unique characteristics that require massive entry costs and high R&D investment; therefore, it has been a frequent strategic industrial policy target (Benkard, 2000). Governments consider the aircraft industry economically and politically significant. Economically, the industry generates dynamically increasing returns and contributes to the domestic economy through technology spillovers into other industries, creation of high-wage jobs, and exports. Politically the industry is important because the national defense industry is closely linked with the civil aircraft industry technology (Wittig, 2010) These combined factors lead governments to support aircraft industries through means such as R&D subsidies.”<sup>134</sup>

Production of globally marketed civil aircraft is concentrated in the US and EU. Countries like Canada and Brazil are also notable for their share of global production in smaller aircraft. Policies in each of these jurisdictions have been the subject of disputes invoking the SCM Agreement. These disputes are illustrative of the diversity of forms that government support to a specific industry can take, mirroring the EU’s proposed measures to stimulate the domestic semiconductor sector. One characteristic of the usage of WTO Dispute Settlement Understanding provisions relating to subsidization of aircraft development and manufacturing is

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<sup>133</sup> Several provisions of the SCM Agreement are exempted or conditioned on future agreement of specific multilateral rules on civil aircraft, cf. Art. 6 & 8.

<sup>134</sup> Wonkyu Shin and Wonhee Lee, ‘Legality of R&D Subsidies and Its Policy Framework under the World Trading System: The Case of Civil Aircraft Disputes’ (2013) 4 27, pg. 29.

that initiating cases typically leads to retaliation—a phenomenon that is potentially indicative for the semiconductor industry given the ubiquity of government support among industrialized nations.

*Table 5) Overview of Commercial Aircraft WTO Disputes*

Case Number	Claimant	Respondent	Dates	Key Issues in the Dispute <sup>135</sup>
<b>DS46</b>	Canada	Brazil	1996 - 1999	<ul style="list-style-type: none"> <li>• Prohibited subsidies</li> <li>• Special &amp; differentiated treatment for developing countries</li> </ul>
<b>DS70</b>	Brazil	Canada	2001 – 2003	<ul style="list-style-type: none"> <li>• Conferral of benefit</li> <li>• Prohibited subsidies</li> </ul>
<b>DS222</b>	Brazil	Canada	2001 - 2003	<ul style="list-style-type: none"> <li>• Definition of subsidies</li> <li>• Prohibited subsidies</li> </ul>
<b>DS316</b>	US	EU	2004 - 2019	<ul style="list-style-type: none"> <li>• Conferral of benefit</li> <li>• Specificity</li> <li>• Prohibited subsidies</li> <li>• Serious prejudice</li> <li>• Injury to domestic industry</li> <li>• Remedies</li> </ul>
<b>DS353</b>	EU	US	2005- 2020	<ul style="list-style-type: none"> <li>• Conferral of benefit</li> <li>• Specificity</li> <li>• Prohibited subsidies</li> <li>• Serious prejudice</li> <li>• Remedies</li> <li>• Adverse effects including through technology effects</li> </ul>
<b>DS487</b>	EU	US	2014 - 2017	<ul style="list-style-type: none"> <li>• Definition of subsidies</li> <li>• Prohibited subsidies</li> </ul>

*Own compilation from WTO database*

One of the earliest disputes in this lineage is DS46, brought by Canada against Brazil. The complaint brought by Canada centered on a program of intervention by the Brazilian government to partly cover the financing costs for the purchase of commercial aircraft by foreign buyers. At the core of the issue, Canada believed that this scheme was in violation of the SCM Agreement and, more specifically,

<sup>135</sup> Interpreted as key for their implications with respect to proposed EU subsidies and only includes cases having reached the stage of a DSB panel report being issued.

constituted a Prohibited export subsidy.<sup>136</sup> To the outcome of the dispute, “the Panel reached the conclusion that [Brazil’s] interest rate equalization payments are subsidies within the meaning of Article 1 of the SCM Agreement, and are contingent upon export under Article 3.1(a) of that Agreement.”<sup>137</sup>

The latter part of the finding by the DSB is perhaps unsurprising, as the financial support was provided under a Brazilian export promotion program, yet the first part of the finding is instructive. It shows that the DSB has interpreted subsidies to exist even in indirect formats—in this case, an indirect arrangement of providing nationally denominated bonds to compensate banks providing credit to foreign purchasers of Brazilian-manufactured aircraft.

The timeline of the dispute ran largely in parallel to a similar complaint raised by Brazil regarding support provided by Canada to its own domestically produced aircraft. In DS70, Brazil claimed that a variety of measures provided by the Canadian federal government and certain provincial governments constituted “subsidies contingent in law or in fact upon export performance.”<sup>138</sup> The DSB found that a narrow subset of the measures which Brazil requested to be reviewed were in fact prohibited subsidies under the SCM Agreement—namely, a publicly backed debt financing account and a technology partnership.<sup>139</sup>

The former finding on the debt financing account revealed the DSB panel’s interpretation that even though the underlying measure was permissible within Canada’s discretion as a Member of the WTO, the application of the program imposed a *de facto* conditionality on export performance. In interpreting the latter measure, the DSB panel considered whether the terms of financing made available were comparable to what would have been offered by a rational market actor and found that the program essentially underwrote the risk of developing new export-

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<sup>136</sup> World Trade Organization, ‘Brazil - Export Financing Program for Aircraft: Request for Consultation by Canada’ (World Trade Organization) Request for Consultation WT/DS46/1 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds46\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds46_e.htm)> accessed 4 May 2022.

<sup>137</sup> World Trade Organization, ‘Brazil - Export Financing Program for Aircraft: Report of the Panel’ (World Trade Organization 1999) WT/DS46/R, pg. 2.

<sup>138</sup> World Trade Organization, ‘Canada - Measures Affecting the Export of Civilian Aircraft’ (World Trade Organization 1997) WT/DS70/1 <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds70\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds70_e.htm)> accessed 4 May 2022, pg. 1.

<sup>139</sup> World Trade Organization, ‘Canada - Measures Affecting the Export of Civilian Aircraft’ (World Trade Organization 1999) WT/DS70/R <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds70\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds70_e.htm)> accessed 4 May 2022, pgs. 227-228.

oriented aircraft.<sup>140</sup> At the same time as DS70, a separate panel reached similar findings in DS222 brought by Brazil against a Canadian export credit program and provincial equity guarantee scheme for commercial aircraft.<sup>141</sup>

The scale of subsidization at issue in the subsequent complaint brought by the US against the EU in what would become DS316 was far greater than for the disputes between Canada and Brazil. The US and EU disputes arose despite efforts to resolve trade tensions surrounding the development and production of civil aircraft through bilateral agreements, the 1979 Agreement on Trade in Civil Aircraft and 1992 Civil Aircraft Agreement.<sup>142</sup> Reflecting the underlying tension in the global market for aircraft as Airbus challenged the incumbent Boeing:

“the 1992 Civil Aircraft Agreement contains 13 articles that regulate various forms of government subsidies – direct subsidies, indirect subsidies, and loans. In regards to direct subsidies, the agreement prohibits the use of direct subsidies for production and places limits on direct subsidies for the development of new aircraft...[limiting] the amount of direct development subsidies at a maximum of 33% of the total development costs; in addition, governments are only allowed to fund projects that are likely to repay the loan within 17 years. The agreement also regulates indirect subsidies for production and development of an aircraft...[allowing] producers to receive indirect support amounting to a maximum of 3% of industry-wide annual commercial sales or 4% of annual commercial sales of a firm in each country. The provision stipulates that benefits from indirect support are deemed to exist when cost reductions to a firm occur from government-sponsored R&D.”<sup>143</sup>

The long excerpt above summarizing the 1992 Civil Aircraft Agreement is included in its near entirety because it is telling for the case of semiconductors. It demonstrates that an attempt to reach a negotiated solution between the US and EU

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<sup>140</sup> World Trade Organization, ‘Canada - Measures Affecting the Export of Civilian Aircraft’ (World Trade Organization 1999) WT/DS70/R <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds70\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds70_e.htm)> accessed 4 May 2022, pg. 227.

<sup>141</sup> World Trade Organization, ‘Canada - Aircraft Credits and Guarantees (DS222)’ (World Trade Organization) <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/1pagesum\\_e/ds222sum\\_e.pdf](https://www.wto.org/english/tratop_e/dispu_e/cases_e/1pagesum_e/ds222sum_e.pdf)>.

<sup>142</sup> Wonkyu Shin and Wonhee Lee, ‘Legality of R&D Subsidies and Its Policy Framework under the World Trading System: The Case of Civil Aircraft Disputes’ (2013) 4 27, pg. 31.

<sup>143</sup> Ibid.

was made, each seeking to address practices of the other that benefitted the competitive position of domestic, technology-reliant firms on international markets.

Despite these attempts to resolve the underlying issue through bilateral agreements, the US withdrew from the Civil Aircraft Agreement in 2004 and initiated dispute proceedings against the EU. This set off a tit-for-tat escalation of disputes, with the EU immediately bringing forward an allegation of illegal subsidies by the US.<sup>144</sup>

In the disputes, the panel considered first whether a financial contribution was conferred to the domestic industry in the respondent country, in this case Airbus and Boeing. The definition of financial contributions include the transfer of funds, foregone government revenue, goods or services provided to the industry apart from general infrastructure (including the purchase of goods from the industry by the government), and income or price support. For a complaint against a subsidy measure to proceed, it also needs to be shown that the subsidy confers a benefit, often interpreted as offering “more favorable conditions than available on the market.”<sup>145</sup>

At issue in the Airbus dispute brought by the US were five main measures: so-called launch aid financing the development of new aircraft models, EU-funded loans and investment projects, infrastructure grants, support for corporate restructuring, and R&D funding.<sup>146</sup> In this instance, launch aid is characterized as the provision of “non-commercial terms of...financing...for projects that would otherwise not be commercially feasible...[that] may include no interest or interest at below-market rates and a repayment obligation that is tied to sales.”<sup>147</sup>

DS316—along with the DS353 and DS487 cases subsequently brought by the EU alleging illegal subsidies by various levels of government in the US to Boeing—were unprecedented in WTO dispute settlement history.<sup>148</sup> Proceedings in DS316 and

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<sup>144</sup> Stephan Wittig, ‘Transatlantic Trade Dispute: Solution for Airbus-Boeing Under Biden?’ [2021] ZBW - Leibniz Information Centre for Economics, pg. 23.

<sup>145</sup> Ibid, pg. 25.

<sup>146</sup> Ibid, pg. 27.

<sup>147</sup> ‘European Communities and Certain Member States - Measures Affecting Trade in Large Civil Aircraft: Report of the Panel’ (World Trade Organization 2010) WT/DS316/R <[https://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds316\\_e.htm](https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds316_e.htm)>, pg. 4.

<sup>148</sup> Jennifer A Hillman and Kara M Reynolds, ‘Article 21.5 DSU Appellate Body Report United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint): Spillovers from Defense R&D Add to the Tug-of-War between Panels and the WTO Appellate Body’ (2021) 20 World Trade Review, pg. 467.

DS353 took far longer than any other disputes to-date, and each yielded vast and intricate panel and Appellate Body reports. The cases can be summarized as such: “in [2019 and 2020] WTO arbitrators concluded that the United States could take countermeasures against the EU for as much as \$7.5 billion annually, while the EU was authorized to take countermeasures against the US to the tune of \$4.0 billion annually, two of the largest awards ever”.<sup>149</sup>

As to the substance of DS316, the DSB panel largely ruled in favor of the US’ allegations that subsidies by the EU and specific Member States had caused “adverse effects in the form of various types of serious prejudice to the interests of the US”.<sup>150</sup> The subsidies at the heart of the panel’s finding were in the form of launch aid and Member State financing initiatives for new Airbus models, equity infusions by the French and German governments in Airbus subsidiaries, infrastructure projects undertaken by the German and Spanish governments benefitting the industry, and R&D programs funded by the EU and Member States.<sup>151</sup>

The Appellate Body essentially upheld the DSB panel’s report in DS316, while reversing the finding of illegal subsidies in the form of launch aid financing for the German, Spanish, and British programs.<sup>152</sup> The case would essentially be relitigated between 2011 and 2016 however, following a complaint by the US that the EU had not taken all necessary steps to remove the serious prejudice and adverse effects caused by domestic measures to support Airbus.<sup>153</sup>

DS353, meanwhile, resulted in the finding after appeal that:

“Two classes of subsidies (government contracts and tax breaks) caused adverse effects to Airbus, specifically: (1) certain NASA and Department of Defense R&D procurement contracts and assistance agreements; and (2) federal Foreign Sales Corporation/Extraterritorial Income, State of

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<sup>149</sup> Jennifer A Hillman and Kara M Reynolds, ‘Article 21.5 DSU Appellate Body Report United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint): Spillovers from Defense R&D Add to the Tug-of-War between Panels and the WTO Appellate Body’ (2021) 20 World Trade Review, pg. 467.

<sup>150</sup> Pramila Crivelli and Luca Rubini, “‘Flying High in a Plane’ Appellate Body Report, European Communities and Certain Member States: Measures Affecting Trade in Large Civil Aircraft (WT/DS316/AB/RW)’ (European University Institute 2019) Working Paper <<https://cadmus.eui.eu/handle/1814/64564>>, pg. 4.

<sup>151</sup> Ibid.

<sup>152</sup> Ibid.

<sup>153</sup> Ibid.

Washington business and occupancy and City of Wichita tax concessions.”<sup>154</sup>

Other illegal subsidies alleged by the EU were rejected by the Appellate Body in DS353.<sup>155</sup> Like in DS316, the EU disagreed that the steps taken by US authorities to implement the DSB ruling were sufficient to comply with the SCM Agreement, and so initiated an additional complaint in 2012. Both the US and EU complaints ultimately culminated in the authorized retaliations mentioned above. The complaint procedures themselves are often regarded as “too fact-intensive to be of general interest”, however the analyses by the DSB panel and Appellate Body in the first stages of both disputes is nonetheless relevant to the discussion in the Sections 3.5 and 4 herein, due to the common technological and R&D dependencies of the industry.<sup>156</sup>

### **3.5 Theorizing Potential Conflicts between WTO Subsidies Disciplines and the Proposed Chips Act**

The breadth of disputes citing the SCM Agreement brings clarity to the analysis of measures proposed by the European Commission aimed at supporting the EU’s domestic semiconductor industry. Notably, the serial DRAMS and commercial aircraft disputes illustrate that complex industries reliant on cross-border specialization in global supply chains are not immune to trade tensions and jockeying by WTO Members to bolster the competitiveness of domestic producers—even among traditional partner economies. The following subsections trace the contours of key considerations that have formed the basis of the previous disputes outlined above, reflecting on their implications for the package of measures proposed as part of the EU Chips Act.

#### **3.5.1 Financial Contribution**

Section 2.5 summarizes the different measures proposed by the European Commission as part of the package of Chips Act draft legislation. Several of these fit within the definitions of financial contribution under the subparagraphs of

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<sup>154</sup> Jennifer A Hillman and Kara M Reynolds, ‘Article 21.5 DSU Appellate Body Report United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint): Spillovers from Defense R&D Add to the Tug-of-War between Panels and the WTO Appellate Body’ (2021) 20 World Trade Review, pg. 467.

<sup>155</sup> Ibid.

<sup>156</sup> Ibid.

Article 1.1 (a) (1). These include “grants”, “loans”, and presumably some form of “equity infusion” depending on the eventual scope of Chips Fund investments.<sup>157</sup> Recall that Objectives 1 through 4 of the proposed Chips Act Regulation entail the provision of common design, experimentation, and competence facilities accessible to a wide range of European firms and RTOs, which could be construed as “goods or services other than general infrastructure” under subparagraph (iii) of Article 1.1 (a) (1).<sup>158</sup>

There is an apparent effort to integrate private entities in the decision-making and governance of measures to support the EU semiconductor industry, both in the form of the ECIC and Chips Joint Undertaking. As illustrated by the DRAMS disputes—DS296, DS299, and DS336—disputants may still be entitled to apply countervailing measures (provided that the additional requisite conditions discussed below are met) if it is determined that the EU has entrusted or directed the aforementioned entities to distribute financial contributions on its behalf. The role of the European Commission and Member States’ public authorities in managing both the ECIC and Chips Joint Undertaking is ostensibly clear in the draft legislation and, if adopted, this would presumably fit the definition of direction under Article 1.1 (a) (1) (iv), avoiding the need for a DSB panel ruling on this aspect of the SCM Agreement in a possible future dispute.

The second part to establishing whether a financial contribution exists is determining whether a benefit is conferred. Typically, conferral of benefit is at the heart of any dispute involving the SCM Agreement; it is the essence of what the complainant perceives as unfair to the domestic industry. The determination is also an intricately technical and therefore highly case-specific process. In general terms, a benefit is understood to have been conferred where a subsidy improves the recipient or recipients’ position relative to what would have otherwise been available to them through the private market.

In the DRAMs disputes, the logic applied for determining benefit was relatively straightforward. Hynix Semiconductors received support from the South Korean government despite being deemed uncreditworthy by private investors. Conferral

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<sup>157</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 1.

<sup>158</sup> *Ibid.*



of benefit was also at the heart of Brazil's claims against Canada in DS70, in which the latter had enacted a program to provide credit to aircraft manufacturers that would not need to be repaid if the venture proved unsuccessful.

Several features of the proposed Chips Act legislation likely fit the criteria for conferral of benefit. EU firms and RTOs can expect to benefit from common research infrastructure, open source intellectual property resources, experimental facilities, and pilot lines, underwriting part of their risk and R&D expenditures. Likewise, one of the objectives of the intended Chips Fund is to support companies facing difficulty in accessing finance through private channels. Any potential dispute involving these measures would likely face the question of benchmarking to the extent that there may not be an evident comparison to the private market.

### **3.5.2 Specificity**

Apart from the Chips Fund, it is apparent that the majority of funds to be allocated to the semiconductors industry will be in the form of grants and procurements. Both the Digital and Horizon Europe programs, along with the legislation underlying the Chips Joint Undertaking, include eligibility and award criteria for beneficiaries, with due reference to the procedures established by the EU Financial Regulation.<sup>159</sup> This ostensibly fulfills the carve-out under Article 2.1 (b) of the SCM Agreement, which requires "objective criteria or conditions governing the eligibility for, and the amount of, a subsidy".<sup>160</sup> However, the DSB panel found in DS299 that a limited number of firms receiving a disproportionately large amount of a subsidy's overall allocation could nullify the carve-out mentioned above.

Without supplementary legislation or implementation guidelines, the proposal for a Chips Fund does not appear to meet the conditions for being deemed non-specific under Article 2 of the SCM Agreement. Consequently, an overconcentration of grants and procurements awarded to a limited number of firms and a Chips Fund which did not lay down investment criteria would risk exposure to countervailing measures and dispute, if deemed to be harmful to the domestic industry of another

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<sup>159</sup> Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 [2018] OJ L193.

<sup>160</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 2.

WTO Member. Even with investment criteria meeting the carve-out under Article 2.1 (b) of the SCM Agreement, the need to avoid overconcentration would continue to apply to the Chips Fund.

### **3.5.3 Prohibited Subsidies**

To the extent that measures under the proposed Chips Act legislation constitute subsidies—pursuant to the criteria considered in Sections 3.5.1 and 3.5.2—they are largely targeted towards upstream pre-commercial R&D. The draft legislation does not contain any export contingencies. Despite the DSB panel’s broader interpretation of export contingencies to include *de facto* observations in DS70, the primarily research-oriented and experimental applications of funding proposed under the Chips Act suggests that the measures would be shielded from subparagraph (a) of Article 3.1.

There is greater risk when considering the prohibition of domestic content contingencies under Article 3.1 (b). Recalling that the stated objective of the Digital Decade strategy articulated by the European Commission is to achieve greater autonomy in the supply of semiconductors, the share held by foreign producers on the EU market will necessarily decrease. Policy statements of this nature have been determinative in previous disputes, such as DS336. At the same time, it is clear from DS70 that there is precedent by the DSB for considering *de facto* effects when assessing whether a measure is consistent with Article 3.1 of the SCM Agreement.

### **3.5.4 Adverse Effects & Serious Prejudice**

Should they be deemed to fit the definitions under Articles 1 and 2 of the SCM Agreement, the package of measures proposed under the Chips Act draft legislation face a gauntlet of potential challenges to navigate the criteria for Actionable Subsidies under Articles 5 and 6.

In DS336, the Appellate Body lowered the standard for determining injury to the domestic industry of a WTO Member. If a complainant were able to demonstrate the existence of a link between EU subsidies and a loss of revenue that would have otherwise accrued to the domestic industry of another Member, the EU measures

would risk incurring countervailing measures under Part V of the SCM Agreement.<sup>161</sup>

Article 5.1 (c) of the SCM Agreement also gives rise to a number of conditions to avoid, collectively known as serious prejudice and subsequently detailed under Article 6.<sup>162</sup> Objectives 1 and 4 of the proposed Chips Act Regulation primarily target design capabilities. This comprises one of the most upstream and least capital-intensive segments of the semiconductor industry. Design firms typically reinvest only a small share of revenue, suggesting that subsidies they received would be unlikely to exceed the 5% *ad valorem* threshold indicated in Article 6.1 (a) of the SCM Agreement.<sup>163</sup> Manufacturers, on the other hand, typically reinvest up to 50% of revenues in their production capacities.<sup>164</sup>

Although funding for Objectives 1 through 4 of the proposed Chips Act Regulation are ostensibly directed towards pre-commercial ventures, there does not appear to be a clear mechanism for preventing such facilities from being absorbed into commercial ventures. For smaller firms involved in manufacturing semiconductors, the risk is potentially greater for subsidization to exceed 5% of the value of the product, assuming that it is ultimately marketed.

Given the scale of public funding being mobilized for the semiconductor industry and competition of ambitions between economies, Article 6.3 of the SCM Agreement merits close scrutiny as announced subsidies come into fruition. It is difficult to see how the objectives of the Digital Decade—aiming to increase the autonomy of supply for domestic semiconductors in the EU as well as its share of the global market—can be achieved without triggering a circumstance amounting to serious prejudice under sub-paragraphs (a) through (c) of Article 6.3.<sup>165</sup>

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<sup>161</sup> Agreement on Subsidies and Countervailing Measures [1994], Part V.

<sup>162</sup> *Ibid.*, Arts. 5 & 6.

<sup>163</sup> *Ibid.*, Art. 5; Note that conversely, under Article 11 of the SCM Agreement, subsidies which are determined to fall below 1% of the value of the product in question are considered to be below the *de minimis* threshold and not subject to investigation.

<sup>164</sup> Varas Antonio and others, ‘Strengthening the Global Semiconductor Supply Chain in an Uncertain Era’ (Boston Consulting Group & Semiconductor Industry Association 2021) <<https://www.bcg.com/publications/2021/strengthening-the-global-semiconductor-supply-chain>> accessed 12 May 2022, pg. 15.

<sup>165</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 6.

Serious prejudice is therefore the most contentious aspect of any potential dispute. It is the allegation that subsidies by another Member are distorting the market for a given product, either through displaced imports into the subsidizing Member, displaced exports to third countries, or significant price undercutting.<sup>166</sup> Not surprisingly, the determination of serious prejudice by authorities responsible for countervailing duties was a recurring issue addressed by the DRAMS disputes, as well as the principal Boeing and Airbus disputes, DS316 and DS353. In the latter disputes, it is noteworthy that the measures successfully challenged by the complainants included R&D grants and procurements.

In both cases, the analysis of whether serious prejudice had led to adverse effects entailed sophisticated economic analysis. Both the DSB panels and Appellate Body effectively upheld that the respondents had acted in accordance with their obligations under the SCM Agreement in determining serious prejudice caused by subsidization in the complainant Member. This indicates that upstream R&D subsidies are not shielded from accepted effects-oriented methodologies for determining serious prejudice. Furthermore, there is a burden of proof on subsidizing Members under Article 6.2 of the SCM Agreement to demonstrate that their measures do not result in serious prejudice.<sup>167</sup>

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<sup>166</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 6.

<sup>167</sup> *Ibid.*

## 4. Conclusion

The point of departure for this study is a hypothesis that the global semiconductor industry, which has benefited from specialization across countries, is trending towards a new era of turbulence. Previous cycles in the industry demonstrate that governments are strongly motivated to intervene when the incumbent position of a domestic industry or national champion is at stake. Faced with a rapidly declining market share for incumbent manufacturers during the 1980s, the US government exerted pressure on its Japanese counterparts to secure the latter's voluntary export restraints and market access commitments. The 1986 Semiconductor Trade Agreement was abandoned a few years later, partly as a result of intense criticism from downstream manufacturers in the US who faced higher prices for intermediate semiconductors.

Around the same time, the establishment of the WTO led to the codification of new trade disciplines on subsidies. Within a matter of years, Members' conformity with the SCM Agreement as applicable to the semiconductor industry was being disputed before the DSB. Like with the US in the 1980s, South Korea's incumbent national champion and a leader in DRAMS production was ailing in the face of foreign competitive pressures. The South Korean government sought to reverse the decline through successive rounds of restructuring conditioned on favorable lines of credit. The measures enacted by the South Korean government in support of Hynix Semiconductors were investigated and, in turn, countervailed by authorities in other major DRAMS markets—the US, EU, and Japan. As a result of several early disputes, the application of these countervailing measures was largely upheld as consistent with the SCM Agreement.

Contemporary semiconductors are increasingly intertwined with national security considerations, intellectual property disputes, and other policy priorities that render the current industry model increasingly liable to disruption. Unilateral export restrictions on semiconductor technology and key material inputs are the measure *du jour*, exercised by countries seeking a mix of objectives ranging from protecting

domestic industries to seeking to coerce geopolitical outcomes. At the same time, vast sums of money are being mobilized from public budgets with the stated aim of strengthening domestic semiconductor capacities.

With the assumption that the scale of competition and stakes of trade tensions in the semiconductor industry are likely to be expressed through as many channels as possible, an adversarial analysis of measures proposed under the Chips Act draft legislative package in the EU has been simulated. The purpose has been to identify potential risks to the measures currently being considered by the EU institutions, from the perspective of international trade disciplines on subsidies, while drawing lessons from previous disputes to mitigate the risk of a complainant's dispute against the EU being successful. At the same time, the study considers whether the proposed legislation is coherent in addressing what is likely one of the most complex industries and sophisticated supply chains in the world.

In elaborating on the first research question, the package of measures proposed by the draft Chips Act were found to be likely to fit within the definition financial contribution and conferral of benefit criteria of the SCM Agreement's definition of subsidies. There is an indication that robust procurement discipline and financial rules with criteria-based eligibility and award conditions could prevent the subsidies from being subject to further provisions of the SCM Agreement under the specificity carve-out, however it is not possible to determine that this would apply to the proposed Chips Fund based on the draft legislation.

If a measure is ultimately determined to fit the triumvirate definitions of financial contribution, benefit, and specificity, there are several hurdles to clear in terms of effects-based analysis in order to ensure that it is outside the scope of the SCM Agreement's Prohibited or Actionable Subsidies categories. There do not appear to be provisions of the proposed legislation that are explicitly problematic under Parts II and III of the SCM Agreement, yet it is also clear that previous DSB panels have considered *de facto* effects of subsidies in determining whether they are consistent with the Agreement.<sup>168</sup> This potentially exposes the aims stated by the European

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<sup>168</sup> Agreement on Subsidies and Countervailing Measures [1994], Parts II & III.

Commission, to increase autonomy of domestic supply and global market share, to being invoked in future dispute proceedings.

The proposed Chips Act legislation contains a range of measures targeting different segments of the semiconductor supply chain. This complicates the analysis of adverse effects and serious prejudice, as it involves a diverse mix of potential complainants. To exemplify this, consider that the US holds more than a 50% share of the market by value for semiconductor design and intellectual property, and the facilities and resources proposed under the Chips Act could be construed as infringing on this position.<sup>169</sup> Further down the supply chain, production capacity, is concentrated in east Asia. Taiwan has a virtual monopoly on fabrication of the most advanced semiconductors, for which the European Commission outlines a target of increasing the EU's share of production by 2030.<sup>170</sup> As indicated in Table 1, both have their own domestic semiconductor industry ambitions.

Addressing the second research question closely follows the first. Identifying potential conflicts between EU law under consideration to support the domestic semiconductors industry and commitments to international trade disciplines creates the context for making adjustments to mitigate these risks. The most judicious intervention would be to clearly establish all proposed subsidies within the specificity carve-out under Article 2.1 (b) of the SCM Agreement, while incorporating safeguards to facilitate a proportionate and equitable distribution of funds to diverse beneficiaries.<sup>171</sup> The latter part of this mitigation measure is not only important as a principle of good administrative law and accountability of public funds, but also in the frame of precedent established by DS299 where a disproportionate allocation of subsidies to a limited number of eligible entities was found to nullify the specificity carve-out.

The existence of a Non-Actionable Subsidies category of the SCM Agreement has encouraged a notional conceit that R&D subsidies are insulated from being successfully disputed. This was shown not to be the case, as R&D subsidies were

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<sup>169</sup> Varas Antonio and others, 'Strengthening the Global Semiconductor Supply Chain in an Uncertain Era' (Boston Consulting Group & Semiconductor Industry Association 2021) <<https://www.bcg.com/publications/2021/strengthening-the-global-semiconductor-supply-chain>> accessed 12 May 2022, pg. 5.

<sup>170</sup> Ibid, pgs. 33-37.

<sup>171</sup> Agreement on Subsidies and Countervailing Measures [1994], Art. 2.

found to have caused adverse effects to the counterpart industries in the Airbus and Boeing series of disputes. The findings of the DSB panel in DS316, upheld by the Appellate Body, are instructive for the crafting of future R&D subsidies for the EU semiconductor industry, insofar as they show that subsidies allocated through competitive procedures (in this case, the program implemented by the United Kingdom) were not in violation of the SCM Agreement.

In consideration of the third research question, industry observers note different characteristics that drive subsidies at different segments of the semiconductor industry. Compared with other industries, the rate of R&D projects that do not reach commercial fruition is high. The nature of intellectual property protections on upstream designs and other inputs to semiconductor manufacturing also reduces private incentives to reinvest in R&D. Therefore, private R&D spending and reinvestments for RTOs and upstream design firms have comprised a smaller share of overall revenues.<sup>172</sup>

This is in stark contrast to the manufacturing segment where, at the leading edge, up to 50% of annual revenues are reinvested in production capacities. Here, the motivation for subsidies is different. Foundries are often a bottleneck in the semiconductor creation cycle, as well as one of the more visible manifestations of the industry. Subsidizing firms involved in the manufacturing of semiconductors may appeal to policymakers as a fix to supply constraints, though lack of private capital is typically not the most pressing issue behind short-term supply crunches.

The second part of the final research question addresses whether, in the face of an extraordinarily complex industry, the package of proposed EU measures to support the domestic development and production of semiconductors is coherent. Section 2 traces the different components of the draft legislation, leading to the observation that the proposed Chips Act largely entails the enlistment of existing initiatives, namely the Digital Europe and Horizon Europe programs and the Key Digital Technologies Joint Undertaking. This is not only likely to have the benefit of increasing ease of access to funds once the legislation is approved, with potential

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<sup>172</sup> Varas Antonio and others, 'Strengthening the Global Semiconductor Supply Chain in an Uncertain Era' (Boston Consulting Group & Semiconductor Industry Association 2021) <<https://www.bcg.com/publications/2021/strengthening-the-global-semiconductor-supply-chain>> accessed 12 May 2022, pgs. 23-34.



recipients more likely to already be familiar with granting and procurement procedures, but also reduces the likelihood of a successful challenge under the SCM Agreement.

Not all aspects of EU law are currently aligned with the objectives underpinning the Chips Act proposal. In its Communication of the proposal, the European Commission outlined the intent to establish the EU's share of the market for semiconductors using advanced materials, cited as a key component in cutting-edge telecommunications and renewable energy applications.<sup>173</sup> EU applied tariffs on key materials like silicon carbide and gallium nitride are higher than most other inorganic compounds, however. At 5.5% *ad valorem*, the tariffs for these primary inputs are also higher than for finished semiconductors, which enter the EU duty free.<sup>174</sup>

For an industry already struggling to manage imbalanced supply and demand brought about by exogenous shocks, a serious escalation of trade disputes would prove to be severely disruptive. Prior tensions have shown that such disputes are rarely taken up in isolation. Rather, they are a metaphorical powder keg, triggering a cascade of retaliatory cases—even between countries sharing an established history of close economic cooperation. The aim of fostering a vibrant semiconductor industry is legitimate and well-attuned to the needs of a modern economy. Communicating transparent objectives of providing support to the semiconductor industry in non-discriminatory terms reduce the potential for trade conflicts with peer countries, in tandem with the confidence that measures are soundly designed with due regard for the disciplines of the SCM Agreement.

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<sup>173</sup> European Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Chips Act for Europe' COM (2022) 45 final, pg. 7.

<sup>174</sup> Referencing CN2849 (silicon carbide) and HS 8542 (semiconductors): Commission Implementing Regulation (EU) 2018/1602 of 11 October 2018 amending Annex I to Council Regulation (EEC) No 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff [2018] OJ L273.



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