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"SUBSIDIZING TECHNOLOGY COMPETITION: CHINA'S EVOLVING PRACTICES AND INTERNATIONAL TRADE REGULATION IN THE POST-PANDEMIC ERA"

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Subsidizing Technology Competition: China's Evolving Practices and International Trade Regulation in the Post-Pandemic Era

Weihuan Zhou* & Mandy Meng Fang**

Abstract

This article contributes to the growing debate about industrial policies and subsidies, the adequacy of the rules of the World Trade Organization ('WTO'), and future international negotiations of industrial subsidies, using China's practices in the high-tech sector as an illustration. Through a review of China's industrial policies in the high-tech sector including the blueprint for the forthcoming 14th Five-Year Plan (2021-2025), we show China's entrenched commitments and ambitions towards indigenous innovation, technology independence and global leadership in key and emerging technologies especially in strategic sectors. However, we challenge the mainstream view that the existing WTO rules are inadequate to deal with Chinese subsidies. Based on a detailed analysis of the general subsidy rules and the relevant China-specific rules, we argue that the current rules create no hurdle to tackling the major types of technology subsidies in China. Any perceived deficiencies are not China-specific and can only be addressed by WTO Members via negotiations. If such negotiations are desirable, then governments should seek to leverage the impacts of the pandemic and the global (ab)use of subsidies to generate the political will needed. Drawing on existing proposals for the reform of WTO subsidy rules, we develop some general principles and approaches to facilitate future negotiations emphasizing the need to focus on targeting trade-distortive subsidies rather than China, to balance between strengthening subsidy rules and preserving policy space, to follow economic guidance and data while accommodating political considerations, and most innovatively, to shift from the 'one-size-fits-all' approach to a country-specific approach through a scheduling method whereby an Industrial Subsidy Schedule is created to record policy objectives, subsidy commitments and exceptions of each nation.

Keywords: China; WTO; US, Technology competition; Industrial policies; Subsidies; Trade War; ASCM; WTO-plus obligations; Negotiations.

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I. INTRODUCTION

Technological competition has become one of the most defining elements in the US-China trade tensions. While China is unwaveringly committed to a new growth model based on the promotion of technological capability and indigenous innovation especially in strategic sectors, the US has enduring and considerable concerns about China's approaches to technological advancement and the growing challenges that China's achievements and ambitions have posed to US interests and values.[1] The Trump Administration has responded with a series of measures ranging from the well-known Section 301 tariffs on a massive list of Chinese products[2] and the ban of the supply of US technology, hardware and software to China's tech giant Huawei,[3] to less-known ones such as the so-called 'China Initiative' to enforce laws against technology theft in all US states, export controls over 'foundational' and 'emerging' technologies, and restrictions on the funding of joint research and development ('R&D') activities with China.[4] However, China's reactions have been firmly defensive and proactive making continuous efforts to strengthen, refine and upgrade policy priorities and strategies in support of technology-based economic development and digital transformation.

The race for global technological supremacy by the world's two largest trading nations has profound and far-reaching implications for international trade regulation. The two-year-long bilateral trade war, with technological competition being one of the underlying drivers of it,[5] has amply demonstrated the shift of US trade policy to unilateralism in tackling China-related problems and the catastrophic damage that shift has inflicted on multilateralism. The US-China Phase One trade deal[6] does not address the systemic issues – particularly China's industrial policies, subsidies and state-owned enterprises ('SOEs') – that are at the core of China's technological development policies and practices. Moreover, the dispute settlement mechanism established under the deal is essentially intended to maintain a unilateral and confrontational approach to

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1 See eg. Office of the United States Trade Representative ('USTR'), 'Findings of the Investigation into China's Acts, Policies and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 301 of the Trade Act of 1974' (22 Mar. 2018), available at: https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF. For a recent report on China's technological achievements in a variety of strategic sectors, see Tarun Chhabra et al., 'Global China: Technology', Brookings (Apr. 2020), available at: www.brookings.edu/research/global-china-technology/.

2 See Office of the USTR, 'China Section 301-Tariff Actions and Exclusion Process', undated, available at: https://ustr.gov/issue-areas/enforcement/section-301-investigations/tariff-actions.

3 See eg. United States Department of Commerce, 'Commerce Department Further Restricts Huawei Access to US Technology and Adds Another 38 Affiliates to the Entity List', undated, available at: www.commerce.gov/news/press-releases/2020/08/commerce-department-further-restricts-huawei-access-us-technology-and.

4 See Brendan Thomas-Noone, 'Tech Wars: US – China Technology Competition and What It Means for Australia', United States Studies Centre (Jun. 2020) at 6-15, available at: www.ussc.edu.au/analysis/us-china-technology-competition-and-what-it-means-for-australia.

5 See generally Marianne Schneider-Petsinger et al., 'US–China Strategic Competition: The Quest for Global Technological Leadership', Chatham House (Nov. 2019), available at: www.chathamhouse.org/sites/default/files/publications/research/CHHJ7480-US-China-Competition-RP-WEB.pdf.

6 See Office of the USTR, 'Economic And Trade Agreement Between The Government Of The United States Of America And The Government Of The People's Republic Of China' (15 Jan. 2020), available at: https://ustr.gov/countries-regions/china-mongoliataiwan/peoples-republicchina/phase-one-trade-agreement/text.

resolving disagreements on the implementation of the deal and in future negotiations.[7] Finally, this deal does not pay due respect to well-established international trade rules creating a range of WTO-inconsistency issues.[8] While whether the Biden Administration will take a more moderate and cooperative approach towards China and the WTO remains to be seen,[9] the competition between the two superpowers on technological and other fronts is likely to intensify.

The COVID-19 outbreak has imposed unprecedented pressure on governments to make the best use of policy tools at their disposal to ameliorate the effects on national economy and maintain economic resilience. In the pursuit of economic nationalism, governments have resorted to a wide spectrum of trade, monetary and fiscal measures – such as export restrictions, stimulus packages and subsidies – paying little attention to the impact of these measures on trade and trading partners.[10] For China, technology becomes even more crucial for economic recovery and continuous growth such that more resources are set to be deployed to promote R&D and innovation and build new enabling infrastructure in strategic sectors. These initiatives will strengthen China's commitment to technological advancement and propel its pursuit of global leadership in technology and innovation, thereby increasing the likelihood of an escalation of bilateral strategic competition.[11]

Many experts and observers have rightly called upon governments to combat the pandemic through collective actions as unilateralism and protectionism are mutually destructive.[12] However, the pandemic is not the root cause of the crisis in US-China economic relations or international trade cooperation more generally (although it has arguably accelerated and worsened it). Many fundamental problems predate COVID-19 and will persist after it. When it comes to technological rivalry, one of the US's top concerns has been China's state-led development model and the provision of significant and extensive subsidies and other forms of support to create national

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7 See Weihuan Zhou, 'WTO Dispute Settlement Mechanism Without the Appellate Body: Some Observations on the US-China Trade Deal', (2020)9(2) *Journal of International Trade and Arbitration Law* 443, 451-453.

8 See Weihuan Zhou and Henry Gao, 'US-China Phase One Deal: A Brief Account', Regulating for Globalization (22 Jan. 2020), available at: http://regulatingforglobalization.com/2020/01/22/us-china-phase-one-deal-a-brief-account/.

9 There have been numerous opinion pieces and interviews on US trade and China policies under the Biden Administration. See eg. Eric Emerson et al., 'The US Trade Agenda in the Biden Administration', Global Trade Policy Blog (10 Nov. 2020), available at: www.steptoeglobaltradeblog.com/2020/11/client-advisory-the-us-trade-agenda-in-the-biden-administration/#more-2010; Eamon Barrett, 'Why A Biden Presidency Won't End the U.S.-China Trade War', Fortune (9 Nov. 2020), available at: https://fortune.com/2020/11/09/joe-biden-us-china-trade-war/. For a recent US official document which details the challenges posed by China and possible US responses in the future, see Office of the Secretary of State, The Policy Planning Staff, 'The Elements of the China Challenge', Nov. 2020, available at: www.state.gov/wp-content/uploads/2020/11/20-02832-Elements-of-China-Challenge-508.pdf.

10 For example, the latest data from the WTO shows that around 80 countries and customs territories have introduced export restrictions or restrictions on essential goods. See WTO, 'COVID-19 and World Trade', available at: www.wto.org/english/tratop_e/covid19_e/covid19_e.htm.

11 For a recent report on the US-China decoupling in the tech sector, see Alex Capri, 'Strategic US-China Decoupling in the Tech Sector', Hinrich Foundation (4 Jun. 2020), available at: www.hinrichfoundation.com/research/white-paper/trade-and-technology/us-china-decoupling-tech/.

12 See eg. Richard Baldwin and Simon J. Evenett (eds), *COVID-19 and Trade Policy: Why Turning Inward Won't Work* (CEPR Press, 2020); Simon J. Evenett and Alan Winters, 'Preparing for A Second Wave of COVID-19: A Trade Bargain to Secure Supplies of Medical Goods', Global Trade Alert (26 Apr. 2020), available at: www.globaltradealert.org/reports/52; Barry Eichengreen and Douglas A. Irwin, 'The Slide to Protectionism in the Great Depression: Who Succumbed and Why?', (2010-12)70(4) *Journal of Economic History* 871.

champions in the high-tech sector.[13] Although subsidies are used widely by governments for various policy goals and constitute an essential policy tool to stimulate economic recovery during the pandemic,[14] there seems to be a shared concern, as highlighted in a series of US-EU-Japan joint statements,[15] about China's industrial policies and subsidies due to their size, complexity and growing impact globally.[16] Therefore, it is reasonable to anticipate that such policies and subsidies will remain at the centre of the heightening US-China tech competition and international trade rulemaking in the post-pandemic era.[17]

This article makes a number of contributions to the ongoing debate about China's industrial policies and subsidies, the adequacy of existing WTO rules, and future international negotiations of industrial subsidies. Although we use China's high-tech sector as an illustration, our discussions and observations may be applied to other Chinese industries and subsidies. Likewise, our proposals for future negotiations of subsidy rules are generally applicable at multilateral and sub-multilateral levels.

Section II provides an overview of the evolution of China's industrial policies in pursuit of technological advancement and innovation. It shows China's entrenched commitments and growing ambitions towards indigenous innovation, technology independence and global leadership in key and emerging technologies especially in strategic sectors. At the same time, it points out that technology-related industrial policies are widespread, that all economies will need policy space for the use of subsidies in support of such policies, and that compared to other countries, China is subject to more stringent international rules on the use of subsidies. In doing so, this section sets the necessary background for a more detailed analysis of China's major subsidies in the high-tech sector and the adequacy of existing WTO rules to tackle these subsidies.

Section III expounds the typical types of China's technology subsidies and the key legal criteria for determining whether such subsidies may be captured under the WTO Agreement on Subsidies and Countervailing Measures ('ASCM'). Contrary to the dominant view that the ASCM rules, as applied and interpreted by WTO tribunals particularly the Appellate Body, have significant deficiencies in addressing Chinese subsidies (such as the scope of "financial contributions", the

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13 See eg. Office of the USTR, '2019 Report to Congress on China's WTO Compliance', Mar. 2020, at 30-32, available at: https://ustr.gov/sites/default/files/2019_Report_on_China%E2%80%99s_WTO_Compliance.pdf.

14 See Simon J. Evenett, 'International Trade Governance: 30 Years after the Marrakesh Agreement', 10 Jun. 2020, available at: www.cigionline.org/articles/international-trade-governance-30-years-after-marrakesh-agreement.

15 See eg. Office of the USTR, 'Joint Statement on Trilateral Meeting of the Trade Ministers of the United States, Japan, and the European Union', 23 May 2019, available at: https://ustr.gov/about-us/policy-offices/press-office/press-releases/2019/may/joint-statement-trilateral-meeting; Office of the USTR, 'Joint Statement on Trilateral Meeting of the Trade Ministers of Japan, the United States, and the European Union' [hereinafter 2020 Joint Statement], 14 Jan. 2020, available at: https://ustr.gov/about-us/policy-offices/press-office/press-releases/2020/january/joint-statement-trilateral-meeting-trade-ministers-japan-united-states-and-european-union.

16 A recent effort to deal with Chinese industrial policies and subsidies has been an EU White Paper seeking to address the transnational effect of subsidies (implicitly) targeting China. See European Commission, 'White Paper on Levelling the Playing Field as regards Foreign Subsidies', COM(2020)253 final (17 Jun. 2020), available at: https://ec.europa.eu/competition/international/overview/foreign_subsidies_white_paper.pdf. For a detailed discussion of the issue of transnational subsidies contemplated in the White Paper in light of the existing WTO subsidy rules, see Victor Crochet and Vineet Hegde, 'China's 'Going Global' Policy: Transnational Subsidies under the WTO SCM Agreement', KU Leuven Working Paper No. 220 (Feb. 2020), available at: https://ghum.kuleuven.be/ggs/publications/working_papers/wp220-crochet-hegde.pdf.

17 See Alan Dupont, 'New Cold War: De-risking US-China Conflict', Hinrich Foundation (24 Jun. 2020), available at: www.hinrichfoundation.com/research/white-paper/us-china-trade/new-cold-war/.

rules on "public body" and the use of external benchmarks for the determination of "benefit conferred"), we argue that these rules do not create any substantive obstacle to tackling the major types of subsidies being applied in China's high-tech sector. Further, in the few circumstances where difficulties may arise, they arise in relation to all WTO Members and are not China-specific. In any event, China's WTO-plus obligations have provided not only additional tools to address these difficulties in tackling Chinese subsidies but also rules that are broad enough to constrain government intervention in the Chinese economy more generally. Therefore, WTO Members should be encouraged to increasingly use the existing rules to explore their full potential to deal with Chinese subsidies, while in the meantime noting that the ASCM is not the sole source of discipline to address State-led market distortions in China.

If reforms of the existing subsidy rules are desirable, such reforms can only be undertaken by WTO Members via negotiations. The widespread use of industrial subsidies during the pandemic has created a golden opportunity for governments to rethink the issues of subsidies and generate the political will needed for international cooperation to further develop the subsidy rules. Section IV engages in the discussion of reforms by reviewing the major proposals in the literature and developing some general principles and approaches for future negotiations of industrial subsidies. We argue that the negotiations (1) must focus on addressing trade-distortive subsidies in all economies involved as opposed to being disproportionately focused on China, and (2) need to achieve a balance whereby further regulation of subsidies would not unduly constrain the capacity of governments to use subsidies for legitimate regulatory goals. The most innovative element of our proposal is, perhaps, the call for the creation of country-specific commitments and exceptions via a scheduling approach, similar to what has been applied in relation to tariff concessions and commitments on trade in services. That is, each WTO Member should have an Industrial Subsidy Schedule that records the sectors in which subsidies are or may need to be granted, the policy objective(s) and magnitude of the subsidies, any upper limit and phase-down or phase-out periods of existing subsidies, and any foreseeable exceptions. This approach would facilitate negotiations as it responds to countries' different regulatory priorities and different economic, political, social and other situations and constraints in terms of the use of subsidies, the level of support, etc. especially in the post-pandemic era.

Section V sets forth the conclusion.

II. CHINA'S HIGH-TECH POLICIES

A. China's Technology Policies in the Global Context

China's industrial policies and subsidies in the high-tech sector, and the overwhelming criticism of them, need to be discussed objectively in the global context. There are at least three important and related observations.

First, technological advancement is critical for economic growth across all economies at all stages of development.[18] Governments of developed and developing countries alike have constantly resorted to a mix of policy instruments, including direct and indirect financial and non-financial support, to promote R&D and innovation.[19] While the policy prescriptions may vary according to local preferences and different levels of development, such support continues to grow and diversify.[20] Relatively recent examples are US subsidies, in the form of tax breaks, to some of the world's largest and most innovative and profitable tech firms such as Apple, Amazon, Facebook, and Google,[21] and Australia's longstanding assistance to its steel industry with almost half of the assistance devoted to R&D.[22] Faced with heightened competition with China, the US government is currently considering an investment of $100 billion on new technologies.[23]

Second, industrial policies in selected strategic technology-related sectors have been common and have played a crucial role in helping countries to catch up with more advanced and innovative economies. In that endeavour, the global technology leaders today (such as the US, Germany, Japan, and South Korea)[24] and the emerging ones (such as India) have all relied heavily on such policies to develop technological capabilities and in many cases, to create national champions in priority sectors.[25] Notably, governments and public entities have played a vital role in promoting and implementing these policies, triggering competitive government intervention on many occasions, [26] including competitive subsidies as illustrated by, for instance, the US-Japan competition in the semiconductor sector in late 1980s[27] and the now 16-year-long US-EU tensions over subsidization of their own national champions in the aviation sector.[28]

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18 See Organisation for Economic Co-operation and Development ('OECD'), OECD Science, Technology and Industry Outlook 2012, OECD Publishing (2012) at 117-118, available at: www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-outlook-2012_sti_outlook-2012-en.

19 See generally Michel Dumont, 'Assessing the Policy Mix of Public Support to Business R & D', (2017)46(10) *Research Policy* 1851.

20 Ibid. Also see above n 18, OECD, OECD Science, Technology and Industry Outlook 2012, at 156-159; Silvia Appelt et al., 'Measuring R&D Tax Support: Findings from the New OECD R&D Tax Incentives Database', OECD Science, Technology and Industry Working Papers 2019/06 (15 Oct. 2019) 20-21, available at: www.oecd-ilibrary.org/science-and-technology/measuring-r-d-tax-support_d16e6072-en.

21 See Dominic Rushe, 'US Cities and States Give Big Tech $9.3bn in Subsidies in Five Years', The Guardian (2 Jul. 2018), available at: www.theguardian.com/cities/2018/jul/02/us-cities-and-states-give-big-tech-93bn-in-subsidies-in-five-years-tax-breaks.

22 See Australian Government, Productivity Commission, 'Government Assistance to Industry' (Dec. 2017), available at: www.pc.gov.au/news-media/pc-news/pc-news-december-2017/trade-assistance-2015-16.

23 See Jeffrey Mervis, 'U.S. Lawmakers Unveil Bold $100 Billion Plan to Remake NSF', Science (26 May 2020), available at: www.sciencemag.org/news/2020/05/us-lawmakers-unveil-bold-100-billion-plan-remake-nsf.

24 See Iman Ghosh, 'Ranked: The Most Innovative Economies in the World', Visual Capitalist (28 Feb. 2020), available at: www.visualcapitalist.com/world-most-innovative-economies/; WTO, *World Trade Report 2006: Exploring the Links between Subsidies, Trade and the WTO* (Geneva: WTO, 2006) 80-88.

25 See generally Michele Di Malo, 'Industrial Policies in Developing Countries: History and Perspectives' in Mario Cimoli et al. (eds) *Industrial Policy and Development: The Political Economy of Capabilities Accumulation* (Oxford: Oxford University Press, 2010) 108-143; above n 18, OECD, OECD Science, Technology and Industry Outlook 2012.

26 See above n 25, Malo, 'Industrial Policies in Developing Countries: History and Perspectives', at 111-112.

27 See generally Douglas A. Irwin and Peter J. Klenow, 'High Tech R&D Subsidies, Estimating the Effects of Sematech', NBER Working Paper No. 4974 (Dec. 1994), available at: www.nber.org/papers/w4974.pdf. For a more detailed review of the development of innovation policies in the US and Japan since 1990s, see The National Research Council, *21st Century Innovation Systems for Japan and The United States: Lessons from a Decade of Change* (Washington D.C.: The National Academies Press 2009).

28 See Reuters, 'Timeline: Highlights of the 16-Year Airbus, Boeing Trade War', Reuters (15 Feb. 2020), available at: www.reuters.com/article/us-wto-aircraft-timeline/timeline-highlights-of-the-16-year-airbus-boeing-trade-war-idUSKBN20901R; Pramila Crivelli and Luca Rubini, ' 'Flying High in a Plane' Appellate Body Report, *European*

Third, in addition to domestic policy instruments, technological development in many countries has also relied on foreign investment policies including promotion of technology transfer and trade policies such as import restrictions, local content rules and export promotion.[29] These measures, together with subsidies and other domestic instruments, have become more controversial over time and are subject to more rigorous international rules under the WTO. This is especially the case in terms of China whose WTO commitments extend significantly beyond general WTO obligations in both coverage and rigidity. Therefore, compared with the regulatory freedom that countries used to have in pursuit of technology-and-innovation-based economic growth, China and other economies still in the process of technological catch-up have relatively limited policy space today.

B. The Evolution of China's Technology Policies

Like the evolution of technology policies worldwide, the definition and scope of 'high-tech sector' has also been evolving. The lack of a uniform definition or scope internationally is in parts due to the lack of criteria/methods to adequately and accurately capture all 'high-tech sectors',[30] rapid technological developments and transformation resulting in fast-growing new areas of challenges,[31] and varying national policy preferences and priorities, amongst other reasons. Despite the absence of such consensus, China, like many other countries, sets out its own high-tech industries, development goals, supportive policy instruments, guidance for implementation, etc. in its national policies.

'Technology modernization' formed an integral element of China's national policy for economic reform and development as early as 1963 (known as the 'Four Modernizations' set forth by China's first Premier Zhou Enlai),[32] which was subsequently incorporated into the well-known Economic Reform and Opening-Up policy in 1978.[33] Like many other countries, the State has played a critical role since this early development of the high-tech sector by creating key science and technology initiatives such as the so-called '863', '973', 'Spark' and 'Torch' programs and the pouring of

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Communities and Certain Member States – Measures Affecting Trade in Large Civil Aircraft', (2020)19(2) *World Trade Review* 316.

29 See generally above n 25, Malo, 'Industrial Policies in Developing Countries: History and Perspectives'; Keith E. Maskus, 'Encouraging International Technology Transfer', ICTSD-UNCTAD Issue Paper No. 7 (May 2004), available at: https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2195. For a discussion of the issue of 'forcing' technology transfer in China's foreign investment regime and the relevant rules and disputes in the WTO, see Weihuan Zhou, Huiqin Jiang and Qingjiang Kong, 'Technology Transfer under China's Foreign Investment Regime: Does the WTO Provide a Solution?', (2020)54(3) *Journal of World Trade* 455.

30 See generally Thomas Hatzichronoglou, 'Revision of the High-Technology Sector and Product Classification', OECD Science, Technology and Industry Working Papers 1997/02 (1 Jan. 1997), available at: www.oecd-ilibrary.org/science-and-technology/revision-of-the-high-technology-sector-and-product-classification_134337307632.

31 See eg. Johan Schot and Edward Steinmueller, 'Three Frames for Innovation Policy: R&D, Systems of Innovation and Transformative Change', (2018)47(9) *Research Policy* 1554; Sandra Planes-Satorra and Caroline Paunov, 'The Digital Innovation Policy Landscape in 2019', OECD Science, Technology and Innovation Policy Papers 2019/71 (6 May 2019), available at: www.oecd-ilibrary.org/science-and-technology/the-digital-innovation-policy-landscape-in-2019_6171f649-en.

32 周恩来[Zhou Enlai], 1964 年政府工作报告(摘要) [Government Work Report 1964 (Summary)], available at: www.gov.cn/premier/2006-02/23/content_208787.htm [in Chinese].

33 中国共产党第十一届中央委员会第三次全体会议(公报) [Report of the Third Plenary Session of the 11th Central Committee of the Communist Party of China in 1978], available at: http://cpc.people.com.cn/GB/64162/64168/64563/65371/4441902.html [in Chinese].

massive funds into them.[34] The Torch Program, for example, was established in 1988 to promote the commercialization of Chinese R&D in selected high-tech zones and received a range of financial support.[35] As one of the pilot reforms to integrate technology into economic development, this initiative made significant contributions to China's technological and industrial transformation and exports of higher-value, technology-intensive goods.

In 1995, China developed the 'technology modernization' strategy into one which underscored the vital importance of science and education to economic growth (i.e. *Ke Jiao Xing Guo*), marking the beginning of an era in which national policies have consistently prioritized scientific and technological advancement especially in strategically important sectors.[36] The Ninth Five Year Plan (1996-2000) set out seven key areas of high technologies including information technology, bio-technology, new materials, new energy, aviation, aerospace, and marine technology.[37] A wide array of supportive measures were put in place to enhance the technological capability and competitiveness of domestic entities in these sectors. For instance, the Decision on Deepening the Reform of the Science and Technology System, issued by the State Council in 1996, directed governments at all levels and government-funded public institutions to give preference to high-tech products with Chinese intellectual property rights ('IPRs') in their public procurement.[38] In 1999, the central government created the 'Innovation Fund' which was one of the first designed to help small-and-medium-sized tech firms to overcome financing problems in developing innovative products.[39] The scope of the strategic sectors have been refined, updated and broadened in subsequent national policies in light of new challenges, opportunities and priorities.

The Tenth Five Year period (2001-2005) expanded the scope of strategic sectors and emphasized technologies of critical importance to national economy and security and the promotion of their commercial application.[40] The National Medium- and Long-Term Science and Technology Development Plan for 2006-2020, issued by the State Council in 2005, further refined the strategic

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34 For a thorough discussion of China's early stage technological development and State policies, see generally Margaret McCuaig-Johnston and Moxi Zhang, 'China Embarks on Major Change in Science and Technology' (Occasional Paper Series Volume 2, Issue No. 2, June 2015), available at: www.ualberta.ca/china-institute/media-library/media-gallery/research/occasional-papers/stmccuaigjohnston-zhang201506.pdf.

35 See The Ministry of Science and Technology of China, Torch High Technology Industry Development Center, available at: www.most.gov.cn/zzjg/zzjgzs/zzjgsyhjzx/; Sebastian Heilmann, Lea Shih and Andreas Hofem, 'National Planning and Local Technology Zones: Experimental Governance in China's Torch Program', (2013) 216 *China Quarterly* 896.

36 《关于加速科学技术进步的决定》[The Decision on Accelerating Science and Technology Development], issued by the Chinese Communist Party Central Committee and State Council on 6 May 1995, available at: www.gov.cn/test/2009-09/29/content_1429943.htm.

37 《关于国民经济和社会发展"九五"计划和2010年远景目标纲要》[Ninth Five-Year Plan for Economic and Social Development of the People's Republic of China and the Outlines of Objectives in Perspective of the Year 2010 (1996 – 2000)], issued on 17 Mar. 1996, effective on the same date, available at: www.npc.gov.cn/wxzl/gongbao/2001-01/02/content_5003506.htm.

38 《国务院关于"九五"期间深化科学技术体制改革的决定》[Decision concerning the Deepening of the Reform of the Science and Technology Management System during the 'Ninth Five-year Plan' Period], issued by the State Council on 15 Sep. 1996, available at: http://guoqing.china.com.cn/2012-05/30/content_25518912.htm.

39 《关于科技型中小企业技术创新基金的暂行规定》[Provisional Regulation on Innovation Fund for Small- and Medium-sized Tech-Firms], issued jointly by the Ministry of Technology and Ministry of Finance on 21 May 1999, available at: http://ltfzs.mofcom.gov.cn/article/ak/am/200511/20051100917797.shtml.

40 《关于国民经济和社会发展第十个五年计划纲要》[Tenth Five-Year Plan for Economic and Social Development of the People's Republic of China (2001–2005)], issued on 5 Mar. 2001, effective on the same date, available at: www.gov.cn/gongbao/content/2001/content_60699.htm. The new areas or sectors mainly included high-speed broadband network, high performance computer and large-scale application software.

sectors and put forward, for the first time, 'indigenous innovation' as a national strategy which is essentially aimed at developing China's own IPRs, innovative capability and global competitiveness.[41] These policy objectives were subsequently reaffirmed in China's Eleventh Five Year Plan (2006-2010)[42] and implemented through a broad range of existing and new instruments, such as preferential tax and government procurement policies, export promotion of homemade high-tech products with IP ownership and brand names, numerous funds and loans, etc.[43]

China's Twelfth Five Year Plan (2011-2015), which launched the innovation-based growth model, upgraded the policy priorities in the high-tech sector with an emphasis on moving up the value chain through indigenous innovation and technological advancement in seven strategic sectors: clean energy technology; next-generation information technology; bio-technology; high-end equipment manufacturing; new energy; new materials; and clean energy vehicles.[44] The State Council subsequently released an implementation plan in July 2012 to lay down the details of these sectors, major development goals and actions and corresponding policy changes.[45] The implementing guidelines, issued by the Ministry of Industry and Information Technology ('MIIT') at around the same time, set out in greater detail the priority technologies, products and entities and mandated local governments to prepare and report their own list of preferences and supportive financial and regulatory arrangements.[46] In December 2014, the State Council announced a plan[47] to create five national funding programs – i.e. the National Natural Science Fund;[48] the Major Science and Technology Projects ('Megaprojects');[49] the National Key R&D

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41 《国家中长期科学和技术发展规划纲要（2006-2020）》[The National Medium- and Long-Term Science and Technology Development Plan for 2006-2020], issued by the State Council on 9 Feb. 2006, available at: www.most.gov.cn/mostinfo/xinxifenlei/gjkjgh/200811/t20081129_65774.htm. The Plan set out three key components of 'indigenous innovation' including genuinely original innovation; integrated innovation, i.e. the fusing together of existing technologies in new ways; and 're-innovation', i.e. the assimilation and improvement of imported technologies.

42 《中华人民共和国国民经济和社会发展第十一个五年规划纲要（2006–2010）》[Eleventh Five-Year Plan for Economic and Social Development of the People's Republic of China (2011–2015)], issued on 16 Mar. 2006, effective on the same date, available at: www.gov.cn/ztzl/2006-03/16/content_228841.htm.

43 《国家"十一五"科学技术发展规划》[The Development Plan of Science and Technology during the Eleventh Five-Year Plan], issued by the Ministry of Science and Technology on 31 Oct. 2006, available at: www.most.gov.cn/kjgh/kjfzgh/200610/t20061031_55485.htm.

44 《中华人民共和国国民经济和社会发展第十二个五年规划纲要(2011–2015)》[Twelfth Five-Year Plan for Economic and Social Development of the People's Republic of China (2011–2015)], issued on 14 Mar. 2011, effective on the same date, available at: www.gov.cn/2011lh/content_1825838.htm.

45 《国务院关于印发'十二五'国家战略性新兴产业发展规划的通知》(2012) [Notice of the State Council on Issuing the National Strategic Emerging Industry Development Plan for the Twelfth Five-Year 2012], issued by the State Council on 9 Jul. 2012, effective on the same date, available at: www.gov.cn/zwgk/2012-07/20/content_2187770.htm.

46 《关于印发战略性新兴产业关键共性技术和关键产品推进重点的通知》[The Notification of the Ministry of Industry and Information Technology on Issuing Development Priorities of Key Generic Technologies and Key Products in Strategic Emerging Industries], issued by the Ministry of Industry and Information Technology on 11 Jul. 2012.

47 《国务院关于印发深化中央财政科技计划（专项，基金等）管理改革方案的通知》[Notice on Deepening the Reform Plan of Central Fiscal Measures on Technology (Funds)], issued by the State Council on 7 Jan. 2015, available at: www.most.gov.cn/tpxw/201501/t20150106_117285.htm.

48 This program focuses on basic research and applied research in natural sciences, particularly physics and mathematics; chemistry; life sciences; earth sciences; engineering and materials; information sciences; and management sciences.

49 This program encompasses 16 vanguard programmes addressing major key products, technologies and engineering of strategic importance for the Chinese economy and industrial competitiveness.

Programs;[50] the Technology Innovation Guidance Fund;[51] and the Bases and Talents Program[52] – aimed at systematically reshaping the entire national funding system for science, technology and innovation.

This policy upgrade paved the way for the promulgation of the famous 'Made in China 2025' (hereinafter 'MIC 2025'), an ambitious ten-year action plan to develop technological capability and indigenous innovation in ten strategic industries (and indeed the landmark of China's technology-oriented industrial policy development).[53] These industries – including information technology; numerical control tools and robotics; aerospace equipment; ocean engineering equipment and high-tech ships; railway equipment; energy saving and new energy vehicles ('NEVs'); power or renewable energy equipment; new materials; medicines and medical devices, and agricultural machinery – encompass virtually all high-tech industries that have served to drive the economic growth in advanced economies.[54] They were estimated to constitute nearly 40 percent of China's entire industrial value-added manufacturing.[55] Notably, the MIC 2025 is aimed at reducing dependence on foreign technologies and boosting self-sufficiency and the internationalization of Chinese home-made technologies throughout value chains including foundational technologies (eg. semiconductors), core technologies (eg. electric vehicle batteries) and future technologies (eg. autonomous driving).[56] Massive funds, loans and other financial and regulatory preferences have been allocated to support implementation with (selected) national champions created.[57] By the end

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50 This program incorporates several existing programmes such as the "863 Program" for R&D, and the "973 Program" for basic research. It supports R&D in areas of social welfare and livelihood, such as agriculture, energy and resources, environment, health, etc. It features several well-targeted and defined objectives and deliverables to be achieved in a period ranging from three to five years, reflecting a top-down and industry-university-research cooperation design which integrates basic research, technology application, demonstration and commercialization.

51 This Fund consists of three major funds emerged from a structural re-organization, re-classification and merging of existing national funds from different government departments. These funds are in turn organized into several sub-funds or funds-of-funds, which invest in priority and strategic areas through venture capital funds, private equity, and risk compensations. The aim is to stimulate the transfer and commercialization of scientific technology results by supporting the growth and activities of innovative start-ups and small-and-medium-sized enterprises.

52 This program incorporates several existing programmes from the Ministry of Science and Technology (State Key Laboratories, National Engineering Technology Centres, Innovation Talents Promotion Programme) and the National Development and Reform Commission (National Engineering Centres/Labs, National Enterprise Technology Centres, etc).

53 《国务院关于印发<中国制造 2025>的通知》(2015) [Notice on the Printing and Release of 'Made in China 2025' (2015)], issued by the State Council on 8 May 2015, effective on the same date.

54 Jost Wubbeke et al., 'Made in China 2025: The Making of A High-Tech Superpower and Consequences for Industrial Countries', Mercator Institute for China Studies No. 2 (Dec. 2016) at 6, available at: https://merics.org/en/report/made-china-2025; Max J. Zenglein and Anna Holzmann, 'Evolving Made in China 2025: China's Industrial Policy in the Quest for Global Tech Leadership', Mercator Institute for China Studies No. 8 (Jul. 2019) at 10-11, available at: https://merics.org/en/report/evolving-made-china-2025.

55 US Chamber of Commerce, 'Made in China 2025: Global Ambitions Built on Local Protections' (2017) www.uschamber.com/sites/default/files/final_made_in_china_2025_report_full.pdf.

56 National Manufacturing Strategy Advisory Committee,《中国制造 2025 重点领域技术路线图》[Made in China 2025 Key Technology Roadmap], Oct. 2015, available at: www.cae.cn/cae/html/files/2015-10/29/20151029105822561730637.pdf. The National Manufacturing Strategy Advisory Committee is a think tank of the State Council. The Roadmap sets forth domestic production localization targets and international market share targets in various high-tech sectors. For instance, by 2025, indigenous industrial robots should capture 70% of the domestic market, domestic high-performance computers and servers should capture 40% of the international market and more than 80% of the domestic market, etc.

57 See eg. 《关于金融支持工业稳增长调结构增效益的若干意见》[Several Opinions on Finance to Support Industry Stable Growth, Restructuring, and Improving Profits], issued jointly by eight State ministries and departments on 16 Feb. 2016, available at: www.gov.cn/xinwen/2016-02/16/content_5041671.htm. The

of 2015, for example, 780 state-guided funds with a total value of RMB 2.2 trillion had been established to support various initiatives and industries, including a significant portion for industries tied to MIC 2025.[58] In 2017, the MIIT and the China Federation of Industrial Economics jointly announced a list of 104 champions in the manufacturing industry developed under the MIC 2025.[59] In the meantime, the State Council mandated the establishment of national MIC 2025 Demonstration Zones and that all relevant central and local government departments and organs make available all sorts of financial and regulatory support for that purpose.[60]

The Thirteenth Five Year Plan (i.e. 2016-2020) further refined the priority sectors to seven strategic industries: energy-saving and environmental protection; new-generation information technology; biology; high-end equipment manufacturing; new energy; new materials; and new-energy automobile.[61] The State Council mandated the creation and allocation of various government financial support including, for instance, a national financing guarantee fund to facilitate loans by financial institutions to eligible enterprises,[62] and the subsidization of acquisition of advanced technologies domestically and overseas, which made China the world's largest acquirer in the technology industry in 2016.[63] By the end of the Thirteenth Five-Year period, China has become a global leader in many emerging technologies ranging from high-speed railways and NEVs to 5G networks and artificial intelligence.[64]

As flagged earlier, the COVID-19 outbreak has strengthened China's commitment to technological advancement and innovation as an essential approach to economic recovery and continuous growth. A series of initiatives have been rolled out for that purpose including, for example, the promotion and commercialization of major technology projects to revitalize

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Opinions encourage banks to provide financial support to develop indigenous brands and increase export credit insurance for indigenous IP and strategic and emerging industries.

58 See eg. '两万亿元引导基金蓄势待发' [Funds Worth around RMB 2 Trillion is to be Established], Chinese Financial News (7 Apr. 2016, available at: www.financialnews.com.cn/zq/jj/201604/t20160407_95235.html.

59 《两部门关于公布第一批制造业单项冠军示范（培育）企业名单的通告》[Announcement on the First List of Champion Enterprises in the Manufacturing Industry], issued by the Ministry of Industry and Information Technology and China Federation of Industrial Economics on 23 Jan. 2017. This list has been updated annually with the latest being the fourth batch of champion enterprises issued in December 2019, reaching a total of 256 champion enterprises.

60 《国务院办公厅关于创建中国制造 2025 国家级示范区的通知》[The Notice on the Creation of National Demonstration Zones for MIC 2025], issued by the General Office of the State Council on 20 Nov 2017, available at: www.gov.cn/zhengce/content/2017-11/23/content_5241727.htm. Demonstration Zones are mainly established at provincial and equivalent local levels to promote technological advancement, innovation and industrial upgrading and development in the priority sectors in line with MIC 2025.

61 《中华人民共和国国民经济和社会发展第十三个五年规划纲要(2016–2020)》[Thirteenth Five-Year Plan for National Economic and Social Development of the People's Republic of China (2016–2020)], promulgated on 17 Mar. 2016, effective on the same date, available at: www.gov.cn/xinwen/2016-03/17/content_5054992.htm.

62 《国务院 关于印发 '十三五' 国家战略性新兴产业发展规划的通知》(2016) [Notice of the State Council on Issuing the National Strategic Emerging Industry Development Plan for the Thirteenth Five-Year 2016], issed by the State Council on 29 Nov. 2016, effective on the same date, available at: www.gov.cn/zhengce/content/2016-12/19/content_5150090.htm.

63 Huifeng He, 'China Overtakes US as Top Nation for Technology Acquisitions', SCMP (29 Apr. 2016), available at: www.scmp.com/tech/china-tech/article/1940084/china-overtakes-us-top-nation-technology-acquisitions.

64 Max J. Zenglein and Anna Holzmann, 'Evolving Made in China 2025: China's Industrial Policy in the Quest for Global Tech Leadership', Mercator Institute for China Studies No. 8 (Jul. 2019) at 9-10, available at: https://merics.org/en/report/evolving-made-china-2025.

production, employment and economic growth, increased financial support for high-tech sectors,[65] and most notably the commitment to build new infrastructure for both short-term and long-term economic goals and digital transformation (hereinafter 'New Infrastructure Initiative') as envisaged in Premier Li Keqiang's Work Report for the third session of the 13th National People's Congress on 22 May 2020 (hereinafter '2020 Government Work Report').[66] Unlike traditional infrastructure, the New Infrastructure Initiative prominently features high technology, high value-added, extensive coverage of industrial chains and huge development potential. This Initiative originated from the Central Economic Work Conference in December 2018, which endorsed the importance of 'promoting the revolution of manufacturing skills and the update of essential tech-supportive equipment, accelerating and expanding the commercialization of 5G, and strengthening artificial intelligence, industrial internet, and internet of things.'[67] The Initiative is well aligned with, and will play a significant role in, China's ambition to become a superpower in science, technology and innovation and to accelerate the transformation to the new phase of digitalization and industrialization as envisaged in China's policy blueprints such as the MIC 2025.[68]

To implement the New Infrastructure Initiative, the 2020 Government Work Report put forward a new investment and development model which is underpinned by diversification of investment sources and the role of market forces, suggesting a departure from state-led investment in traditional infrastructure. In the short term, however, it is likely that central and local governments and SOEs will remain important players in the Initiative.[69] This has become evident in implementation actions adopted at both national and local levels. Some major projects at the central level have involved China Mobile's RMB 100 billion investment in 5G,[70] State Grid's RMB 181 billion investment in ultra-high-voltage power facilities,[71] and China Southern Power Grid's RMB 25 billion investment in concentrated charging stations in the southern region of China in the coming four years.[72] Sub-national governments have also swiftly localized the Initiative and developed implementation strategies. Examples include Beijing's three-year plan focusing on the construction in six core sectors (i.e. new internet infrastructure, data intelligence infrastructure, ecosystem infrastructure, technological innovation infrastructure, smart application infrastructure

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65 《关于科技创新支撑复工复产和经济平衡运行的若干措施》[Several Measures on Supporting the Resumption of Work and Production and the Stability of Economy with Technology and Innovation], issued by the Ministry of Science and Technology on 21 Mar. 2020, available at: www.gov.cn/zhengce/zhengceku/2020-03/22/content_5494142.htm.

66 Premier Keqiang Li, 2020 Government Work Report [2020 年政府工作报告], 22 May 2020, available at: www.gov.cn/zhuanti/2020lhzfgzbg/index.htm

67 '中央经济工作会议举行习近平李克强作重要讲话' (Speech by President Xi Jinping and Premier Li Keqiang at the Central Economic Working Conference), 12 Dec. 2019, available at:. www.gov.cn/xinwen/2019-12/12/content_5460670.htm.

68 See generally Rebecca Arcesati et al., 'China's Digital Platform Economy: Assessing Developments Towards Industry 4.0', Mercator Institute for China Studies (Jun. 2020), available at: https://merics.org/en/report/chinas-digital-platform-economy-assessing-developments-towards-industry-40.

69 Zhang Dingfa and Liu Cheng, 'SOEs Lead the New Infrastructure and Cultivate New Economic Growth Engines', People.cn (24 Apr. 2020), available at: http://ccnews.people.com.cn/n1/2020/0424/c141677-31686310.html.

70 Zhang Lulu, 'China Eyes New Infrastructure to Shore Up Growth', China.org.cn (22 Mar. 2020), available at: www.china.org.cn/business/2020-03/22/content_75844807.htm.

71 Caijing.com.cn, 'China's Centrally-owned Enterprises' Engagement in New Infrastructure Worth of Trillions RMB and the Avoidance of Repeating Previous Path of 4 Trillion Traditional Infrastructure', 21 Mar. 2020, available at: http://finance.eastmoney.com/a/202003211426920955.html.

72 People.cn, 'State Grid and China Southern Power Grid Embark on the Large Scale Construction of Vehicle Charging Stations', 15 Apr. 2020, available at: http://energy.people.com.cn/n1/2020/0415/c71661-31674815.html.

and trusted and secure infrastructure) and 30 key projects,[73] Shanghai's three-year plan to invest RMB 270 billion in four priority sectors (i.e. new internet, new infrastructure, new platform and new terminals),[74] Guangdong's massive construction plan injecting RMB 5900 billion in 1230 projects prioritizing high-speed railway, ultra-high voltage grid, 5G, and new energy.[75] Notably, private companies have been playing an increasing role. China's tech giants such as Alibaba and Tencent have pledged investments of billions of RMB in cloud infrastructure, artificial intelligence, etc.[76]

On 29 October 2020, the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China adopted a Blueprint for the 14th Five-Year Plan (2021-2025) and the 2035 Long-Term Goals.[77] As anticipated, the Blueprint places even more emphasis on technology and innovation as a critical element in the pursuit of technological independence and global competitiveness which in turn serves the overarching goals of modernization and economic development. While the Blueprint maintains the list of the strategic industries contemplated in the MIC 2025 and the 13th Five-Year Plan, it highlights the vital importance of foundational research in a number of frontier areas including artificial intelligence, quantum information, integrated circuits, life health, neuroscience, biological breeding, aerospace, and deep land and deep sea. These policies and objectives will only lead to more government support including the wide spectrum of subsidies mentioned above and discussed in more detail in Section III. Table 1 below provides a summary of the development of the strategic sectors since the Ninth Five Year Plan.

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73 《北京市加快新型基础设施建设行动方案（2020-2022 年）》[Action Plan for Accelerating the Construction of New Infrastructure in Beijing (2020-2022)], issued by the Beijing Municipal Development and Reform Commission on 2 Jul. 2020, available at: www.beijing.gov.cn/fuwu/lqfw/ztzl/xytxms/zxxx/202006/t20200610_1922075.html.

74 《上海市推进新型基础设施建设行动方案 2020-2022 年》[Action Plan for Accelerating the Construction of New Infrastructure in Shanghai (2020-2022)], issued by the Shanghai Municipal Government on 29 Apr. 2020, available at: http://stcsm.sh.gov.cn/zwgk/ghjh/20200603/a4c074e101374866a619424aae7a3fbd.html.

75 《广东省发展改革委关于下达广东省 2020 年重点建设项目计划的通知》[Notice on the Key Construction Projects for 2020], issued by the Guangdong Municipal Development and Reform Commission on 28 Feb. 2020, available at: http://drc.gd.gov.cn/tjxx5631/content/mpost_2956713.html.

76 Josh Horwitz, 'Alibaba to Invest $28 Billion in Cloud Services after Coronavirus Boosted Demand', Reuters (20 Apr. 2020), available at: www.reuters.com/article/us-china-alibaba-cloud-investment/alibaba-to-invest-28-billion-in-cloud-services-after-coronavirus-boosted-demand-idUSKBN22208E; Arjun Kharpal, 'Tencent Pledges $70 Billion Investment in High-Tech Areas as Beijing Pushes Digital Infrastructure', CNBC (27 May 2020), available at: www.cnbc.com/2020/05/27/china-tech-giant-tencent-pledges-70-billion-investment-in-ai-cloud.html.

77 See《中共中央关于制定国民经济和社会发展第十四个五年规划和二 0 三五年远景目标的建议》[The Advice of the Central Committee of the Communist Party of China on the Formulation of the Outline of the 14th Five-Year Plan for the National Economic and Social Development and the 2035 Long Term Goals] (3 Nov. 2020), available at: www.gov.cn/zhengce/2020-11/03/content_5556991.htm. The Blueprint will need to be adopted by the National People's Congress in early 2021, although no substantive changes should be expected.

Table 1: The Development of China's Strategic Sectors (1996-current)

	Priority/Strategic sectors
9th Five Year Plan (1996-2000)	Information technology; Bio-technology; New materials; New energy; Aviation and Aerospace; Marine technology.
10th Five Year Plan (2001-2005)	High-speed broadband network; High performance computer; Super large-scale integrated circuit; Large scale application software; Information technology including national spatial information application and service; Biochip; Genetically-improved animals and plants; Bio-technology including genetically engineered drugs and vaccines; New materials including nanomaterials, special functional materials, and high-performance structural materials; Advanced manufacturing including contemporary integrated manufacturing systems, robotic manufacturing, and aircraft manufacturing; Aerospace technology.
11th Five Year Plan (2006-2010)	Information industry, including integrated circuit, software, wireless communication, high-performance computing, microelectronics, optoelectronics, and network equipment; Bio industry including biomedicine, bio-agriculture, bioenergy and biomanufacturing; Aerospace and aviation industry including new regional aircraft, large aircraft, helicopter, advanced engine, airborne equipment, satellites, and navigation application; New materials industry including nanomaterials, special functional materials, high-performance structural materials, composite materials and environmental conservation and energy saving materials.
12th Five Year Plan (2011-2015)	Energy saving and environmental protection technology, including key equipment, products and services in highly efficient energy saving, environmental protection and resources recycling areas; Next-generation information technology including internet, internet of things, cloud computing, integrated circuits, high-end software, high-end server, mobile communication, new-type display and information service; Bio-technology including biomedicine, biomedical engineering products, bio-agriculture, bioenergy and biomanufacturing; High-end equipment manufacturing including aviation equipment, satellite application, railway equipment and smart manufacturing equipment; New energy including nuclear energy, solar energy application, photovoltaics heating and electricity; wind power equipment, smart grid and bioenergy; New materials including new functional materials, advanced structural materials, high-performance fiber and composite materials; New energy vehicles ('NEVs') including plug-in hybrid electric vehicles, pure electric vehicles and fuel cell electric vehicles.
Made in China 2025	Information technology; Numerical control tools and robotics; Aerospace equipment; Ocean engineering equipment and high-tech ships; Railway equipment; Energy saving and new energy vehicles; Power or renewable energy equipment; New materials; Bio-medicines and high-performance medical devices; Agricultural machinery.
13th Five Year Plan (2016-2020)	Energy-saving and environmental protection; New-generation information technology; Biology; High-end equipment manufacturing; New energy; New materials; and New-energy automobile.
Blueprint for the 14th Five Year Plan (2021-2025) and 2035 Long-Term Goals	Strategic industries: Information technology, biotech, new energy, new materials, high-end equipment, new energy vehicles, green environmental protection, aerospace, and marine equipment. Frontier areas: artificial intelligence, quantum information, integrated circuits, life health, neuroscience, biological breeding, aerospace, deep land and deep sea.

III. INTERNATIONAL REGULATION OF SUBSIDIES

Subsidies are one of the most perplexing and controversial areas of international trade regulation. The current WTO rules on subsidies have undergone nearly eight decades of development since the 1940s and remain underdeveloped and problematic according to the prevailing views of today.[78] The multilateral negotiations leading to the creation of subsidy rules, and eventually the conclusion of the ASCM in the Uruguay Round, have essentially revolved around a few major competing interests including on the one hand, protecting the value of tariff concessions and disciplining trade-distortive subsidies, and on the other hand, the widespread and persistent need to use subsidies for all kinds of regulatory goals and constraining the abuse of countervailing measures.[79] The fundamental challenge, therefore, has been determining how to strike a balance between the regulation of 'bad' subsidies and the preservation of the right of governments to use 'good' ones in pursuit of chosen policy objectives.[80]

This challenge reflects both the standard economics on trade policies and the political bargain in trade negotiations. Trade economists have shown convincingly that subsidies tend to be a more efficient policy instrument (as compared to trade measures such as tariffs and quotas), and indeed the first-best means in many instances, to address domestic externalities or non-trade policy objectives because they target the source of problems more directly. This is known as the Specificity or Targeting Rule derived from the well-established Theory of Distortions and Welfare.[81] Accordingly, economists have cautioned against excessive or overly intrusive discipline on subsidies which would cause governments to resort to second-best instruments and inefficient outcomes, and have reiterated the need for international rules to distinguish between 'bad' and

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78 See eg. John H. Jackson, *The World Trading System: Law and Policy of International Economic Relations* (Massachusetts: The MIT Press, 2nd Ed., 1997) 293-303; Alan O. Sykes, 'The Questionable Case for Subsidies Regulation: A Comparative Perspective', (2010)2(2) *Journal of Legal Analysis* 473; Gary N. Horlick and Peggy A. Clarke, 'WTO Subsidies Discipline During and After the Crisis', (2010)13(3) *Journal of International Economic Law* 859; Chad Bown and Jennifer Hillman, 'WTO'ing a Resolution to the China Subsidy Problem', (2019)22(4) *Journal of International Economic Law* 557.

79 See eg. above n 78, Jackson, *World Trade and the Law of the GATT*, 367-369; Petros C. Mavroidis, *The Regulation of International Trade: The WTO Agreements on Trade in Goods Vol 2* (Massachusetts: MIT, 2016) 186-191; Richard R. Rivers and John D. Greenwald, 'The Negotiation of A Code on Subsidies and Countervailing Measures: Bridging Fundamental Policy Differences', (1979)11(4) *Law & Policy in International Business* 1447; Gerard Depayre, 'Negotiating Subsidies in the GATT/WTO: The Tokyo Round and the Uruguay Round' in Rubini and Hawkins (eds) What Shapes the Law? Reflections on the History, Law, Politics and Economics of International and European Subsidy Disciplines (European University Institute, 2016) 51-56. For a more comprehensive and sophisticated review of Uruguay Round negotiations of subsidy rules, see Terence P. Stewart (ed.), *The GATT Uruguay Round: A Negotiating History (1986-1992) Vol II* (Deventer: Kluwer Law and Taxation Publishers, 1993) 833-884.

80 See Jan Woznowski, 'The Shape of Things: Few Thoughts on Negotiating Rules on Subsidies in the GATT and WTO' in Rubini and Hawkins (eds) What Shapes the Law? Reflections on the History, Law, Politics and Economics of International and European Subsidy Disciplines (European University Institute, 2016) 45-47; Hugo Paemen, 'Forces that (may) Have Shaped Subsidy Regulation' in Rubini and Hawkins (eds) What Shapes the Law? Reflections on the History, Law, Politics and Economics of International and European Subsidy Disciplines (European University Institute, 2016) 49-50.

81 See generally Jagdish N. Bhagwati, 'The Generalized Theory of Distortions and Welfare' in Jagdish N. Bhagwati et al. (eds.) *Trade balance of payments and growth: papers in International Economics in Honor of Charles P. Kindleberger* (Amsterdam London: North-Holland Publishing Co., 1971) 69-90. For a review of the historical development of the theory and its applications, see generally Jagdish N. Bhagwati, *Free Trade Today* (Princeton and Oxford: Princeton University Press, 2002).

'good' subsidies.[82] Generally speaking, 'bad' subsidies would inflict welfare losses on trading partners and the world economy as a whole whereas 'good' subsidies genuinely serve non-protectionist, trade-unrelated regulatory goals (although they may have unintended side-effects on trade).[83] The economic guidance derived from Theory of Distortions and Welfare for future negotiations and development of global subsidy rules will be further discussed in Section IV.

Although trade negotiators are usually knowledgeable about the above economic principles, they are constrained by internal politics and tend to succumb to the pressures of influential constituents.[84] Consequently, the WTO subsidy rules are not so much concerned about the welfare effects of subsidies as about the impact on competing producer interests.[85] The political compromise embodied in the ASCM largely came out of the insistence of the US on stricter rules on subsidies on the one hand, and the resistance of the EU and others (mainly developing countries) to over-regulation and encroachment on policy space on the other hand.[86] The ASCM reached a middle ground by, *inter alia,* limiting the scope of subsidies and addressing the extraterritorial effects of the covered subsidies. Only two types – export subsidies and local content subsidies, which were commonly regarded as being conspicuously trade-distortive – are prohibited. Domestic subsidies are generally 'actionable' only (as opposed to 'prohibited') meaning that Members may take actions to address the adverse effects of these subsidies. The other important element of this compromise was a category of 'non-actionable' subsidies – including certain subsidies for R&D, environmental protection and regional development – which were permitted and exempted from countervailing actions on a provisional basis for five years.[87] However, this category has expired as WTO Members failed to reach a consensus to renew it by 31 December 1999.[88]

R&D subsidies, which are directly relevant to this article, warrant more observation. The Uruguay Round negotiations started with a disagreement between proponents of making R&D subsidies non-actionable (e.g. the EC, Canada, Switzerland, Japan and Nordic Countries) and the US, which opposed the idea of non-actionability in general and regarded R&D subsidies as being susceptible to abuse in particular.[89] The US changed its position at a later stage of the negotiations due to a domestic policy shift to promoting subsidization of R&D activities under the Clinton

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82 See eg. above n 78, Sykes, 'The Questionable Case for Subsidies Regulation: A Comparative Perspective'; Kyle Bagwell and Robert W. Staiger, 'Will International Rules on Subsidies Disrupt the World Trading System', (2006)96(3) *The American Economic Review* 877; Luca Rubini, 'Rethinking International Subsidies Disciplines: Rationale and Possible Avenues for Reform', E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2015; Keith Maskus, 'Research and Development Subsidies: A Need for WTO Disciplines?', E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2015.

83 However, whether a subsidy produces net welfare gains is often ambiguous and difficult to assess as governments tend to subsidize for political reasons without regard to the welfare effects of the subsidy. See above n 24, WTO, *World Trade Report 2006,* 63-64, 107; John H. Jackson, *The World Trading System: Law and Policy of International Economic Relations* (Massachusetts: The MIT Press, 2nd Ed., 1997) 281-282.

84 This observation is widely received in the international trade community and essentially stems from the Public Choice theory. See generally Weihuan Zhou, 'In Defence of the WTO: Why Do We Need A Multilateral Trading System', (2020)47(1) *Legal Issues of Economic Integration* 9.

85 See eg. above n 79, Mavroidis, *The Regulation of International* Trade, at 193-194; above n 78, Sykes, 'The Questionable Case for Subsidies Regulation: A Comparative Perspective', 501-519.

86 See above n 79, Stewart, *The GATT Uruguay Round: A Negotiating History (1986-1992) Vol II*, at 833-884.

87 Articles 8 and 31 of the ASCM.

88 WTO, Committee on Subsidies and Countervailing Measures, Minutes of the Special Meeting Held on 20 December 1999, G/SCM/M/22 (17 Feb. 2000).

89 See above n 79, Stewart, *The GATT Uruguay Round: A Negotiating History (1986-1992) Vol II*, at 904-914.

Administration since 1993.[90] However, this shift did not fundamentally change the overall position of the US which continued to push for stricter discipline on trade-distortive subsidies including confining the scope and magnitude of R&D subsidies and retaining the flexibility to apply countervailing measures to those beyond the agreed limits.[91] The final compromise was the incorporation of a carefully-crafted list of conditions on R&D subsidies, the provisional application of non-actionability, and other requirements (such as notification). The inclusion of R&D subsidies in the non-actionable category is in line with the economic guidance discussed above that subsidies tend to be the optimal means to correct market failures in R&D activities by bringing such activities to the socially optimal level which in turn generates positive spillovers economy-wide.[92] However, it has been observed that the non-actionability conditions were designed to meet the needs of developed economies (particularly the US)[93] and did not accommodate the interests of developing economies. This explains why developing countries opposed the extension of the non-actionable category unless the conditions could be modified to provide room for them to pursue developmental goals.[94] This call for improvement of the applicability of non-actionable subsidies including R&D subsidies for economic development has continued in the Doha Round negotiations.[95] The expiry of non-actionable subsidies means that there is currently no distinction between "good" and "bad" subsidies based on policy objectives underlying the grant of a subsidy under the ASCM.[96] This, in turn, means that the pursuit of a proper balance between disciplining subsidies and preserving policy space must rely on the interpretation and application of other relevant provisions of the ASCM.

As noted earlier, there have been growing concerns about the effectiveness of WTO subsidy rules in dealing with Chinese subsidies effectuated by a series of ambitious industrial policies.[97] One of the latest criticisms in the work of Bown and Hillman identified a number of loopholes or deficiencies in the ASCM in addressing Chinese subsidies, including, *inter alia*, certain issues relating to the definition of subsidies, the difficulties of satisfying the relevant evidentiary burden, and lack

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90 See George Kleinfeld and David Kaye, 'Red Light, Green Light? The 1994 Agreement on Subsidies and Countervailing Measures, Research and Development Assistance, and U.S. Policy', (1994)28(6) *Journal of World Trade* 43, 51-52.

91 Ibid., at 52-54.

92 See above n 24, WTO, *World Trade Report 2006*, at 55-62.

93 See above n 90, Kleinfeld and Kaye, 'Red Light, Green Light? The 1994 Agreement on Subsidies and Countervailing Measures, Research and Development Assistance, and U.S. Policy', at 51-52.

94 WTO, Committee on Subsidies and Countervailing Measures, Minutes of the Regular Meeting Held on 1-2 November 1999, G/SCM/M/24 (26 Apr. 2000). For a more detailed discussion of the various views, see Sadeq Z. Bigdeli, 'Resurrecting the Dead? The Expired Non-Actionable Subsidies and the Lingering Question of 'Green Space", (2011)8(2) *Manchester Journal of International Economic Law* 2, 8-9.

95 See eg. WTO, Negotiating Group on Rules, Improved Rules under the Agreement on Subsidies and Countervailing Measures – Non-Actionable Subsidies, Proposal by Venezuela, TN/RL/W/41 (17 Dec. 2002); WTO, Negotiating Group on Rules, Comments from Australia on Venezuela's Submission on Non-actionable Subsidies under the Agreement on Subsidies and Countervailing Measures, TN/RL/W/61 (11 February 2003); WTO, Negotiating Group on Rules, Improved Rules under the Agreement on Subsidies and Countervailing Measures – Non-Actionable Subsidies, Proposal by Venezuela and Cuba, TN/RL/W/41/Rev.1 (10 March 2003); WTO, Negotiating Group on Rules, Preliminary Answers to the Questions by Australia Contained in Document TN/RL/W/61, Document Submitted by Venezuela and Cuba, TN/RL/W/70 (18 March 2003); WTO, Negotiating Group on Rules, Preliminary Answers of Cuba and Venezuela to the Questions Provided by Egypt Regarding Document TN/RL/W/41, TN/RL/W/108(13 May 2003).

96 See also Wolfgang Muller, *WTO Agreement on Subsidies and Countervailing Measures: A Commentary* (Cambridge: Cambridge University Press, 2017) 7-8.

97 See eg. above n 15, the US-EU-Japan Joint Statements.

of notification and retrospective remedies.[98] However, Bown and Hillman's analysis has two major shortcomings. They did not provide a detailed discussion of specific types of Chinese subsidies and the potential issues in applying the existing rules to these subsidies in light of the case law. Nor did they distinguish between deficiencies specific to China and those generally applicable to all WTO Members. For example, it is hard to see why the lack of notification and retrospective remedies applies to China only. In discussing the applicability of the existing rules to China's subsidies in the high-tech sector below, we will argue that these rules have provided sufficient flexibility to address these subsidies. Most of the potential challenges in the application of these rules are not China-specific but applicable to all WTO Members. Therefore, linking these challenges exclusively to China's subsidies or characterizing them as "China-specific problems" is highly questionable and would not help resolve these problems in future negotiations.

As shown in Section II.B, China's pursuit of technological advancement has involved wide-ranging supportive policy instruments including different forms of subsidies. It is both unrealistic and unnecessary to cover all these instruments and subsidies in this article. Instead, we will consider typical and major examples to facilitate a discussion of the efficacy of the existing WTO rules which include not only the general rules contemplated in the ASCM but also the China-specific rules codified in the Protocol on the Accession of China[99] (hereinafter 'Accession Protocol') and the Report of the Working Party on the Accession of China[100] (hereinafter 'Working Party Report'). As a fundamental matter, our discussion will draw attention to the balance that needs to be achieved between the regulation of trade-distortive subsidies and the preservation of policy space for the use of subsidies for legitimate regulatory goals.[101]

A. Definition of Subsidies

The ASCM does not cover all government actions or measures that may have the effect of distorting trade. Rather, it only applies to certain types of subsidies as defined in Article 1. For a measure to be a covered subsidy, it must constitute a "financial contribution" (or "any form of income or price support") that is provided by a government, a "public body" or a "private body entrusted or directed" to exercise relevant government functions, and confers a "benefit" to the recipient concerned. Bown and Hillman did not take issue with all these legal elements but focused on the limited scope of covered subsidies and the law on the meaning of "public body". For completeness, we will consider each of these elements below.

i. Financial contributions – direct transfer of funds

Article 1.1(a)(1) of the ASCM encompasses three types of "financial contributions": (1) direct transfer of funds; (2) foregoing or non-collection of government revenue otherwise due; and (3) provision of goods or services (other than general infrastructure) or purchase of goods. Although

98 See above n 78, Bown and Hillman, 'WTO'ing A Resolution to the China Subsidy Problem', at 567-572.

99 Protocol on the Accession of the People's Republic of China ('Accession Protocol'), WT/L/432 (23 November 2001).

100 Report of the Working Party on the Accession of China ('Working Party Report'), WT/ACC/CHN/49 (1 October 2001).

101 Notably, the Appellate Body has also suggested that this balanced approach should inform the interpretation of the ASCM. See Appellate Body Report, *United States – Countervailing Duty Investigation on Dynamic Random Access Memory Semiconductors (DRAMs) from Korea* (hereinafter *US — DRAMs*), WT/DS296/AB/R (adopted 20 Jul. 2005), para. 115.

the coverage of "financial contributions" was intended to be exhaustive and arguably to avoid "a purely effect-based concept of subsidies",[102] it has been interpreted and applied in a flexible and broad manner. Indeed, in one of the earlier disputes under the ASCM, the Appellate Body has observed that "financial contribution" covers "a wide range of transactions" "through which something of economic value is transferred by a government".[103] This broad interpretation may be applied to the major forms of Chinese subsidies in the high-tech sector.

"Direct transfer of funds" covers not only measures such as grants, loans and equity infusion but also "potential direct transfers of funds or liabilities" such as loan guarantees. These measures and their variations have been found to constitute a "financial contribution" in a range of cases. The most straightforward examples could be found in cases such as *Australia – Leather*, in which the Australian government provided financial assistance to the sole Australian producer and exporter of automotive leather in two forms: (1) grant payments up to A$30 million; and (2) a fifteen-year loan of A$25 million without interest or repayment of principal for the first five years.[104] The panel had no difficulty finding that the payments and the non-commercial loan constituted "financial contributions" in the form of direct transfer of funds.[105] In *Korea – Commercial Vessels*, the panel found that debt-for-equity swaps and debt rescheduling by way of interest/debt reductions, deferrals and forgiveness in the course of corporate restructuring fell within the scope of direct transfer of funds.[106] In the panel's view, while "interest reductions and deferrals are similar to new loans" and "interest/debt forgiveness is comparable to a cash grant", debt-for-equity swaps are "a combination of equity infusion and debt forgiveness".[107] In *Japan – DRAMs (Korea)*, the Appellate Body clarified that "direct transfer of funds" extends beyond an incremental flow of money to cover "an accrual of financial resources" and other financial claims that improve the financial position of the recipient.[108] Applying this ruling in *EC – Aircraft*, the panel held that a transfer of equity interests or shares in a company also amounted to a transfer of funds.[109] In *US – Aircraft (2nd complaint)*, the Appellate Body confirmed that "debt forgiveness, the extension of a loan maturity and debt-to-equity swaps" are forms of direct transfer of funds similar to those listed in subparagraph (i).[110] It also found that "equity infusion" may take the form of joint venture

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102 Appellate Body Report, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)* (hereinafter *US — Aircraft (2nd complaint)*), WT/DS353/AB/R (adopted 23 Mar. 2012), para. 613 (holding that "Subparagraphs (i)-(iv) exhaust the types of government conduct deemed to constitute a financial contribution"). See also above n 96, Muller, *WTO Agreement on Subsidies and Countervailing Measures: A Commentary*, at 62, 74; above n 79, Mavroidis, *The Regulation of International Trade*, at 202-203, 215-216.

103 Appellate Body Report, *United States – Final Countervailing Duty Determination with respect to Certain Softwood Lumber from Canada* (hereinafter *US — Softwood Lumber IV*), WT/DS257/AB/R (adopted 17 Feb. 2004), para. 52.

104 WTO Panel Report, *Australia – Subsidies Provided to Producers and Exporters of Automotive Leather*, WT/DS126/R (adopted 16 Jun. 1999), paras. 2.1-2.5.

105 Ibid., paras. 9.43-9.45. This finding was not disputed by the parties.

106 WTO Panel Report, *Korea – Measures Affecting Trade in Commercial Vessels* (hereinafter *Korea — Commercial Vessels*), WT/DS273/R (adopted 11 Apr. 2005), paras. 7.336-7.339, 7.411-412.

107 Ibid., para. 7.413.

108 Appellate Body Report, *Japan – Countervailing Duties on Dynamic Random Access Memories from Korea* (hereinafter *Japan — DRAMs (Korea)*), WT/DS336/AB/R (adopted 17 Dec. 2007), paras. 247, 250-252.

109 WTO Panel Report, *European Communities and Certain Member States – Measures Affecting Trade in Large Civil Aircraft* (hereinafter *EC — Aircraft*), WT/DS316/R (adopted 1 Jun. 2011), para. 7.1291.

110 See above n 102, Appellate Body Report, *US — Aircraft (2nd complaint)*, para. 615.

arrangements whereby funds are provided (by NASA/USDOD) in exchange for some kind of return such as scientific and technical information (from Boeing).[111]

As regards the sub-category of "*potential* direct transfers of funds or liabilities", the *EC – Aircraft* panel held that it involves "a legally binding promise" or "an obligation to make a direct transfer of funds which, *in and of itself*, is claimed and capable of conferring a benefit on the recipient that is separate and independent from the benefit that might be conferred from any future transfer of funds" (original emphasis), and that it is unnecessary for the funds to be actually transferred in the end.[112] Subsequently in *US – Aircraft (2nd complaint)*, the panel imposed a limit on the scope of this category by holding that it does not cover measures that merely create the possibility of transfer of funds when pre-defined conditions (or events) have been fulfilled (or have occurred).[113] This suggests that this type of government actions must involve an undertaking to transfer funds upon the fulfillment of pre-defined conditions.

Finally, it is worth noting that the term "direct" does not require a transfer of funds to be made by a government *directly* but merely that a government through its practice has been involved in such a transfer, according to the Appellate Body in *US – Carbon Steel (India)*.[114] Thus, the Appellate Body rejected India's claim that the provision of a loan through an affiliated entity to a public body was not a "direct" transfer of fund merely due to the involvement of an intermediary or intervening agency.[115] It also clarified that the funds transferred do not have to be "drawn from government resources or result in a charge on the public account."[116]

Contrary to widespread concerns about the potential difficulties of identifying Chinese subsidies on the basis that they may often be provided in a sophisticated and opaque manner, some of the major subsidies in the technology sector fall squarely within the category of direct transfer of funds. For example, to boost the growth of the NEVs industry, both central and local governments have provided a range of financial support[117] mainly in the form of direct payments to NEV manufacturers (including R&D grants in the sector)[118] and consumers,[119] and loans from State

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111 Ibid., paras. 622-624. NASA and USDOD, respectively, stand for United States National Aeronautics and Space Administration and United States Department of Defense.

112 See above n 109, WTO Panel Report, *EC — Aircraft*, paras. 7.302, 7.304, 7.733, 7.1495.

113 WTO Panel Report, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)* (hereinafter *US — Aircraft (2nd complaint)*), WT/DS353/R (adopted 23 Mar. 2012), paras. 7.164-7.166.

114 Appellate Body Report, *United States – Countervailing Measures on Certain Hot-Rolled Carbon Steel Flat Products from India* (hereinafter *US — Carbon Steel (India)*), WT/DS436/AB/R (adopted 19 Dec. 2014), para. 4.90.

115 Ibid., paras. 4.93-4.94.

116 Ibid., para. 4.96.

117 Marika Heller, 'Chinese Government Support for New Energy Vehicles as a Trade Battleground', National Bureau of Asian Research (27 Sep. 2017), available at: www.nbr.org/publication/chinese-government-support-for-new-energy-vehicles-as-a-trade-battleground/.

118 See eg.《关于 2018 年度，2016 年及以前年度新能源汽车推广应用补助资金清算审核和 2018 年度，2019 年度补助资金预拨审核情况的公示》[The Publication of the Liquidation Review of New Energy Vehicles Promotion and Application Subsidies in 2018, 2016 and Previous Years and the Review of Additional Subsidies allocated for 2018 and 2019], issued on 25 March 2020, available at: www.hx-jh.com/n1146295/n7281310/c7930717/content.html;《上海市鼓励购买和使用新能源汽车实施办法》[The Implementing Measures on Encouraging the Purchase and Use of New Energy Vehicles in Shanghai], issued by the Office of the Shanghai Government on 31 Jan. 2018, available at: www.shanghai.gov.cn/nw43336/20200824/0001-43336_55412.html.

119 See eg.《关于开展私人购买新能源汽车补贴试点的通知》[The Notice on Launching Pilot Subsidies for Private Purchases of New Energy Vehicles], issued by the Ministry of Finance on 31 May 2010, available at:

banks.[120] Between 2009 and 2017, the total support in the industry was estimated to be RMB 390 billion ($58.3 billion).[121] While the forms and amounts of these subsidies have been reviewed and adjusted regularly in response to changing needs and situations, the overall support for the sector is likely to grow.[122]

Another longstanding example is the massive industrial investment funds the Chinese government has directed the competent national authorities and local governments to establish for eligible enterprises in priority sectors since 1980s.[123] Over time, these funds have targeted start-ups or technology-oriented small- and medium-sized entities to promote indigenous innovation,[124] as well as the creation of national champions.[125] By the end of 2013, 343 such funds with a total value of

www.mof.gov.cn/gp/xxgkml/jjjss/201006/t20100602_2499641.html. For instance, subsidies for plug-in hybrid vehicles and pure electric vehicles can be RMB 50,000 and RMB 60,000 per car.

120 China's First Automotive Workshop recently obtained huge credit line worth RMB 1015 billion from 16 banks in China, including state banks. See, Xinhuanet, 'China's First Automotive Workshop Collaborates Strategically with 16 Banks to Obtain Credit Line Exceeding RMB 1 Trillion', 25 Oct. 2018, available at: www.xinhuanet.com/auto/2018-10/25/c_1123610511.htm. Another example is Tesla, which secured approximately RMB 20 billion loans from Chinese banks for its Shanghai Gigafactory. See Tongxin Qian, 'Tesla Shanghai Obtained Another RMB 4 Billion Loans from Chinese Banks, Totaling RMB 20 Billion Loans', Yicai (9 May 2020), available at: www.yicai.com/news/100622862.html.

121 See Scott Kennedy, 'China's Expensive Gamble on New-Energy Vehicles', Center for Strategic & International Studies (6 Nov. 2018) available at: www.csis.org/analysis/chinas-expensive-gamble-new-energy-vehicles.

122 《关于完善新能源汽车推广应用财政补贴政策的通知》[Notice on Fiscal Policies for the Popularization and the Application of New Energy Vehicles], issued by the Ministry of Finance on 23 Apr. 2020, available at: www.gov.cn/zhengce/zhengceku/2020-04/23/content_5505502.htm. Notably, the detrimental impacts of US – China trade war on China's NEV industry, together with the outbreak of COVID-19, have propelled Chinese central government to extend some of the existing NEV subsidies, which otherwise would lapse in the end of 2020 to the end of 2022. See Jianhua Zhao, 'Why does China Extend New Energy Vehicle Subsidies?', People.cn (26 Apr. 2020), available at: http://auto.people.com.cn/n1/2020/0426/c1005-31688105.html.

123 The New Technology Venture Capital Company was established in 1986 as China's first venture capital company that provided investments and loans for high-tech sector. The major shareholders were: State Scientific and Technological Commission and Ministry of Finance. The company operated for 13 years. See CCTV.com, 'Ministry of Science and Technology: To Accelerate the Development of Venture Capital with Chinese Characteristics and Build New Engine for Innovation-led Growth', 23 Sep. 2016, available at: http://jingji.cctv.com/2016/09/23/ARTIZR6niGUZ2ajwhbFwoVCH160923.shtml.

124 See eg. 《科技型中小企业创业投资引导基金管理暂行办法》[Interim Measures on the Administration of Start-up and Investment Guiding Fund for Technology-oriented Small- and Medium-Sized Enterprises], issued by the Ministry of Finance and the Ministry of Science and Technology on 6 Jul. 2007, available at: www.most.gov.cn/ztzl/gjzctx/ptzcjrzc/200802/t20080225_59300.htm;《战略性新兴产业发展专项资金管理暂行办法》 [Interim Measures on the Administration of Special Funds for the Development of Strategic Emerging Industries], issued by the Ministry of Finance and the National Development and Reform Commission on 31 Dec. 2012, available at: www.gov.cn/gongbao/content/2013/content_2376208.htm; 《新兴产业创投计划参股创业投资基金管理暂行办法》[Interim Measures on the Administration of the Equity Participation of Emerging Industries Start-up and Investment Plan in the Start-up and Investment Fund], issued by the Ministry of Finance and the National Development and Reform Commission on 17 Aug. 2011, available at: www.gov.cn/zwgk/2011-09/09/content_1944275.htm. The prioritized areas included: energy conservation and environmental protection, information, bio and new medicine, new energy, new materials, aerospace and aviation, marine, advanced manufacturing, new energy vehicles, and high- technology service. In 2015, the State Council announced the plan to create RMB 40 billion National Guiding Fund for Start-up Investment in Emerging Industries. See Jun Ding et al., 'The Establishment of National Guiding Fund for Start-up Investment in Emerging Industries with RMB 40 Billion which can be Multiplied by 5 Times' (15 Jan. 2015), available at: www.gov.cn/zhengce/2015-01/15/content_2804446.htm.

125 See OECD, 'Measuring Distortions in International Markets: The Semiconductor Value Chain', OECD Trade Policy Papers No. 234 (12 Dec. 2019) at 51-52 [hereinafter 'OECD Semiconductor Report'], available at: www.oecd-ilibrary.org/trade/measuring-distortions-in-international-markets_8fe4491d-en.

around RMB 270 billion had been created.[126] The scale and amount of the funds has continued to grow explosively since 2014, especially after the launch of the MIC 2025. Major examples include the National Integrated Circuit Investment Fund (2014) ('IC Fund'), [127] the Advanced Manufacturing Industry Investment Fund (2016),[128] and more recently the National Manufacturing Industry Transformation and Upgrading Fund (2019).[129] All of these funds were created under the leadership of the competent central authorities, particularly the Ministry of Finance ('MOF') and the MIIT, supported by State banks and followed by the creation of similar funds by local governments.[130] They were provided to selected enterprises in the sectors mainly by way of equity injection, loans or loan guarantees.[131] The IC Fund, for example, was initially supported by a State-directed loan of RMB 30 billion from the China Development Bank in addition to equity infusion from the MOF and other government entities.[132] Between 2014 and 2018, the first tranche of the fund had invested over RMB 100 billion in 74 projects and 52 IC companies (with nearly 80% of the investment by equity injection)[133] and had contributed significantly to the creation of a handful

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126 Bank of China Research Institute provided a detailed review of China's Government Guiding Funds, see Bank of China Research Institute, 'The Development, Problems and Solutions of China's Government Guiding Funds' (26 Sep. 2017), available at: https://pic.bankofchina.com/bocappd/rareport/201709/P020170929497812585464.pdf.

127 See Ministry of Industry and Information Technology, 'The Establishment of the National Integrated Circuit Investment Fund' (14 Oct. 2014), available at: www.miit.gov.cn/n1146290/n1146402/n7039597/c7053700/content.html.

128 See State-owned Assets Supervision and Administration Commission of the State Council, 'The Establishment of the Advanced Manufacturing Industry Investment Fund' (12 Jun. 2016), available at: www.sasac.gov.cn/n2588025/n2588124/c3822803/content.html.

129 See YICAI, 'Ministry of Finance, China Railway Rolling Stock Corporation and others Initiated the Establishment of the National Manufacturing Industry Transformation and Upgrading Fund Limited Liability Company with Registered Capital Worth RMB 147.2 Billion' (18 Nov. 2019), available at: www.yicai.com/news/100407324.html.

130 See《创业投资企业管理暂行办法》 [Interim Measures on the Administration of Start-up Investment Enterprises], issued jointly by ten State ministries and departments on 15 Nov. 2005, effective on 1 Mar. 2006, available at: www.gov.cn/flfg/2005-11/15/content_99008.htm. The Measures for the first time encouraged sub-national governments to establish investment funds. The number of funds established by sub-national governments has increased significantly in recent years. For instance, Beijing Municipal Government established Technology Innovation Fund worth RMB 30 billion in 2018 to support new generation information technology, nanotechnology, big data and artificial intelligence areas, see Min Ren, 'The Initiation of Beijing Municipal Technology Innovation Fund Worth Dozens Billions to Support High-end Hard Technologies', Beijing Daily (25 Jun. 2018), available at: www.gov.cn/xinwen/2018-06/25/content_5300997.htm; Guangzhou Municipal Government established RMB 5 billion government guiding fund on the industrialization of scientific and technological achievements in 2020. See《关于印发广州市科技成果产业化引导基金管理办法的通知》 [Measures for Administration of the Guiding Fund on the Industrialization of Scientific and Technological Achievements], issued by Guangzhou Science and Technology Bureau on 19 Jun. 2020, available at: http://kjj.gz.gov.cn/gkmlpt/content/5/5955/post_5955622.html#275.

131 See above n 130, Interim Measures on the Administration of Start-up Investment Enterprises. Article 22 stipulates that national and sub-national governments can establish investment funds by means of equity participation and other forms of financing guarantees.《关于印发广州市科技型中小企业贷款担保资金管理办法的通知》 [Measures for Administration of Loan Guarantee Funds for Small and Medium-sized Technology Enterprises], issued by Guangzhou Department of Finance on 21 Jan. 2020, available at: http://czj.gz.gov.cn/gkmlpt/content/5/5637/post_5637742.html#601.

132 See China Development Bank Capital, 'The Establishment of the National Integrated Circuit Investment Fund and Its Management Company', undated, available at: www.cdb-capital.com/GKJR/dynamic/17081111400611?pidx=1. For the shareholding of the Fund, see YICAI, 'The Second Tranche of the National Big Fund was Established and Where RMB 200 Billion will Go', (28 Oct. 2019), available at: www.yicai.com/news/100380063.html.

133 Sina Finance, 'The Analysis of China's National Integrated Circuit Investment Fund First Tranche's Investment' (13 Mar. 2019), available at: https://finance.sina.com.cn/stock/hyyj/2019-03-13/doc-ihsxncvh2157328.shtml.

of the world's leading IC firms.[134] The fund has recently completed its second tranche capital raising of over RMB 200 billion which will focus on investing in home-grown chips for advanced materials and equipment as well as downstream application (such as 5G).[135] Whether these funds constitute "public bodies" and have conferred a "benefit" to the recipients are separate issues to be addressed later. However, the threshold question of whether they fall within the types of "financial contributions" contemplated in Article 1.1(a)(1)(i) of the ASCM does not seem difficult to resolve based on the case law discussed above.

Notably, some of the subsidies in the form of "direct transfer of funds" may constitute export subsidies, one of the two types of prohibited subsidies. China's use of export credits to promote export of high-tech goods offers a good illustration. In practice, such measures have been employed by most major economies, through loans and other forms of financial support, to assist domestic exporters or foreign buyers to purchase goods and services from these exporters.[136] In China, export credit policies have become a major form of support for high-tech firms and exports since the early 2000s including, amongst others, loan support for the export of a list of high-tech products contemplated in the Catalogue of High and New Tech Products and the Catalogue of Chinese New and High-Tech Export Products,[137] and preferential loans, buyer credit or export credit insurance for specific products or projects such as telecommunications[138] and NEVs.[139]

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134 See above n 125, OECD Semiconductor Report, at 51-54.

135 YICAI, 'Focus on the Outline of the Second Tranche of the Big Fund and Possible Priority Areas for Investment' (19 Mar. 2020), available at: www.yicai.com/news/100556598.html; Sarah Dai, 'China Completes Second Round of US$29 Billion Big Fund Aimed at Investing in Domestic Chip Industry', SCMP (26 Jul. 2019), available at: www.scmp.com/tech/science-research/article/3020172/china-said-complete-second-round-us29-billion-fund-will.

136 See Kristen Hopewell, 'Power Transitions and Global Trade Governance: The Impact of A Rising China on the Export Credit Regime', (2019) *Regulation & Governance* 1, 1, 4-5 (published online 23 Apr. 2019); James Nedumpara and Pankhuri Sharma, 'Treatment of Export Credits in WTO Dispute Settlement and Domestic CVD Proceedings', Centre for WTO Studies Working Paper CWS/WP/200/7 (Mar. 2013), 1, 7-9, available at: http://wtocentre.iift.ac.in/workingpaper/Export%20Credit%20CWS%20WP.pdf.

137 《中国进出口银行出口卖方信贷中短期额度贷款管理办法》[The Administration Measures of the Exim Bank of China on Export Sellers' Credit and Short to Medium Term Line of Loan], issued by Exim Bank of China on 4 Feb. 2002, available at: http://pkulaw.cn/fulltext_form.aspx?Db=alftwotitle&Gid=cb00095e263c71c1bdfb. 《中国高新技术产品指导目录》 [The Guiding Catalogue of China's New and High- Tech Products], issued by the Ministry of Science and Technology on 27 Sep. 2009, available at: www.most.gov.cn/tztg/200910/t20091009_73551.htm; 《中国高新技术产品出口目录》[The Catalogue of China's New and High-Tech Export Products], issued by the Ministry of Science and Technology on 9 Jan. 2006, available at: http://most.cn/fggw/zfwj/zfwj2006/200512/t20051220_55439.htm.

138 《大型成套电信设备出口项目协调管理实施细则》[Detailed Rules on the Implementation of Coordination and Management of Large-Scale Complete Set Telecommunication Export Items], issued by the Ministry of Commerce on 5 Jun. 2006, available at: http://file.mofcom.gov.cn/article/gkml/200804/20080499611491.shtml. As alleged by Fred Hochberg, the ex-Chairman and President of the Export-Import Bank of the US, Huawei received USD 30 billion credit line from China Development Bank that allowed the company to "reduce its cost of capital and to offer financing to their buyers at rates and terms better than their competitors." See Fred Hochberg, 'How the US Can Lead the World in Exports: Retooling Our Export Finance Strategy for the 21st Century', Remarks at the Center for American Progress (15 Jun. 2011), available at: www.exim.gov/sites/default/files/newsreleases/CAP_Speech.pdf.

139 《国务院关于印发节能与新能源汽车产业发展规划（2012-2020）的通知》[Notice on Plan for Energy Conservation and New Energy Vehicles Industry Development], issued by the State Council on 28 Jun. 2012, available at: www.gov.cn/gongbao/content/2012/content_2182749.htm.

Such measures are widespread at both central and local levels,[140] making China one of the world's largest providers of export credits.[141] These measures obviously constitute a "financial contribution" and fall within the ambit of items (j) and (k) of ASCM's illustrative list of export subsidies, although the extent to which the ASCM leaves space for the use of export credit remains controversial.[142] However, to the extent that such policy space may cause insufficiencies in the current subsidy rules in dealing with trade-distortive export credit policies, such insufficiencies apply to all WTO Members.

ii. Financial contributions – foregoing or non-collection of government revenue otherwise due

A financial contribution may be granted if a government foregoes or does not collect "revenue that is otherwise due". To date, the WTO case law has predominantly concentrated on tax revenues and has developed a sophisticated legal test which apparently pays due deference to Members' sovereignty "in determining the structure and rates of their domestic tax regime".[143] A major case on this issue is *US – FSC* which concerned the exemption of a foreign sales corporation ('FSC')'s export-related foreign-source income from US income tax. The Appellate Body observed that a determination of "otherwise due" requires a comparison between "the revenues due under the contested measure and revenues that would be due in some other situation" based on "the rules of taxation of each Member".[144] It upheld the panel's finding that the US government had not collected the revenue that it was entitled to collect under its own general rules of taxation.[145] In the compliance proceedings of this dispute, the Appellate Body further clarified that the fact that "a government does not raise revenue which it could have raised" is not, in itself, conclusive as to whether the revenue foregone is "otherwise due".[146] The appropriate benchmark for comparison must be identified and examined based on "the fiscal treatment of the relevant income

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[140] For an example of local export credit policy, see People.cn, 'Shanghai Exim Bank Provides Export Credit to Support the Export of Technology Intensive Integrated Circuit', 17 Oct. 2018, available at: http://sh.people.com.cn/n2/2016/0421/c376039-28193462.html.

[141] See above n 136, Hopewell, 'Power Transitions and Global Trade Governance: The Impact of A Rising China on the Export Credit Regime', at 7-8; Export-Import Bank of the United States, 'Report to the U.S. Congress on Global Export Credit Competition', Jun. 2020, at 38, available at: www.exim.gov/sites/default/files/reports/competitiveness_reports/2019/EXIM_2019_CompetitivenessReport_FINAL.pdf.

[142] For instance, one major controversy concerns the exemption of export credits permitted under "an international undertaking on official export credits" from being treated as an export subsidy under item (k). In practice, this exemption points to the *OECD Arrangement on Officially Supported Export Credits*. However, it remains debatable as to whether WTO Members may still take countervailing actions against such export credits. See generally Dominic Coppens, 'How Much Credit for Export Credit Support under the SCM Agreement?', (2009)12(1) *Journal of International Economic Law* 63; above n 136, Nedumpara and Sharma, 'Treatment of Export Credits in WTO Dispute Settlement and Domestic CVD Proceedings'. A related, ongoing debate has been whether China's export credits comply with the conditions contemplated in the OECD Arrangement. This would require a separate and detailed study on the specific Chinese measures, which seems lacking in the existing literature and falls outside of the scope of this article. See eg. Export-Import Bank of the United States, 'Report to the U.S. Congress on Global Export Credit Competition', Jun. 2020, at 40-44 (the report identified major Chinese export credit measures during 2019 without assessing their compliance with the OECD Arrangement); Gregory Shaffer et al., 'Can Informal Law Discipline Subsidies?', (2015)18(4) *Journal of International Economic Law* 711, 725-729 (observing that the OECD Arrangement has served as multilateral discipline of export credit policies and may be effective in constraining the practices of all countries including China).

[143] See above n 102, Appellate Body Report, *US — Aircraft (2nd complaint)*, para. 811.

[144] Appellate Body Report, *United States – Tax Treatment for 'Foreign Sales Corporations'* (hereinafter *US – FSC*), WT/DS108/AB/R (adopted 20 Mar. 2000), para. 90.

[145] Ibid., paras. 7, 95.

[146] Appellate Body Report, *United States – Tax Treatment for 'Foreign Sales Corporations' – Recourse to Article 21.5 of the DSU by the European Communities* (hereinafter *US – FSC (Article 21.5 – EC)*), para. 88.

for taxpayers in comparable situations".[147] Accordingly, it found that while foreign-source income of US citizens and residents was generally taxable, the contested measure exempted certain foreign-source income from tax amounting to foregoing revenue otherwise due.[148] This legal test was refined in *US – Aircraft (2nd complaint)* where the Appellate Body explained that the comparison should involve "the tax treatment that applies to the alleged subsidy recipients and the tax treatment of comparable income of comparably situated taxpayers" in the jurisdiction concerned.[149] The Appellate Body upheld the panel's affirmative finding of foregoing of revenue otherwise due on the ground that the Washington State Business and Occupation Tax regime applied a lower tax rate to commercial aircraft and component manufacturers compared to the rates applicable to general manufacturing, wholesaling and retailing activities in the state.[150] Finally, if a government does not collect the tax revenue in full at the time that it normally would under the comparable benchmark, that would also amount to foregoing of revenue otherwise due as the government effectively gives up the entitlement to "enjoy the cash available to it and earn interest on it".[151]

Preferential tax treatment has been a well-known source of government support in China's high-tech sector.[152] China's new Corporate Income Tax Law 2008, for example, provides for a reduced tax rate of 15% (as opposed to the standard rate of 25%) for so-called High-New Technology Enterprises ('HNTEs') and permissible reductions of costs and expenses for the research and development of new technology, products and design more generally.[153] To qualify as an HNTE, an entity must undertake R&D in one of the priority high-tech sectors[154] and satisfy a list of conditions including ownership of the proprietary IP rights of the core technology used in its production of goods or services.[155] The law also directs local governments to provide other forms of tax preferences for newly-established HNTEs in designated regions.[156] The Shanghai Pudong

147 Ibid., paras. 90-92.

148 Ibid., paras. 98-105.

149 See above n 102, Appellate Body Report, *US — Aircraft (2nd complaint)*, paras. 812-813.

150 Ibid., paras. 816-831.

151 Appellate Body Report, *Brazil – Certain Measures Concerning Taxation and Charges*, WT/DS472/AB/R, WT/DS497/AB/R (adopted 11 Jan. 2019), paras. 5.220-221.

152 See Ross Buckley and Weihuan Zhou, 'Navigating Adroitly: China's Interaction with the Global Trade, Investment, and Financial Regimes', (2013)9(1) *University of Pennsylvania East Asia Law Review* 1, 20-23.

153 《中华人民共和国企业所得税法》[Corporate Income Tax Law of People's Republic of China], adopted by the National People's Congress on 16 March 2007, effective on 1 January 2008.

154 These sectors are consistent with the national policy plans discussed in Section II and may continue to change accordingly. The most updated criteria can be found in 《高新技术企业认定管理办法》[The Measures on the Administration of the Qualification of High-New Technology Enterprises], issued by the Ministry of Science and Technology, the Ministry of Finance and the State Taxation Administration on 29 Jan. 2016, available at: www.most.gov.cn/tztg/201602/t20160204_123994.htm. 《高新技术企业认定管理工作指引》[The Guidance on the Administration of the Qualification of High-New Technology Enterprises], issued by the Ministry of Science and Technology, the Ministry of Finance and the State Taxation Administration on 22 Jun. 2016, available at: www.chinatax.gov.cn/n810341/n810755/c2200380/content.html.

155 《关于实施高新科技企业所得税优惠政策有关问题的公告》[The Notice on Several Questions Relating to the Implementation of Corporate Income Tax Incentives Policies for High-New Technology Enterprises], issued by the State Taxation Administration on 19 Jun. 2017, available at: www.chinatax.gov.cn/n810341/n810755/c2684881/content.html.

156 See above n 153, Article 57 of Corporate Income Tax Law. Also see clarifications made by the State Taxation Administration on the application of this provision, available at: www.chinatax.gov.cn/chinatax/n810341/n810765/n812176/n812748/c1193020/content.html. The designated regions include four Special Economic Zones in Shenzhen, Zhuhai, Shantou, Xiamen and Hainan, and the Shanghai Pudong New Zone.

New Zone, for instance, provides for a tax exemption for the first two years of operation of HNTEs and a reduced tax rate of 12.5% for the following three years.[157] More recently, similar tax incentives have been extended to the services sector to stimulate investment in so-called Advanced Technology Services Enterprises ('ATSEs').[158] Qualified services include, amongst others, software development and technical support, IC design and test platform, information system and maintenance, business operation and database. Like HNTEs, ATSEs are eligible for a reduced tax rate of 15% and reductions of expenses associated with the education and training of employees. Applying the WTO case law set out above, these tax incentives may be easily found to constitute "foregoing of government revenue otherwise due". One may argue that the benchmark for comparison would be the Chinese tax rules (e.g. corporate income tax rate and deductions) applicable to other entities in the same or comparable industries. Such industries may include those which produce the same or similar goods or services[159] or more broadly, the entire manufacturing sector.[160] To the extent that the reduced tax rate and favorable tax reductions are not applicable to the comparably situated entities, the tax incentives for HNTEs and ATSEs constitute "financial contributions". This analysis may apply to other tax preferences for the selected high-tech sectors.

In addition, it is worth noting that Footnote 1 of the ASCM excludes "duty and tax exemptions or remissions for *exported* products" from being treated as a "financial contribution" in the form of "foregoing of government revenue otherwise due". Therefore, value-added tax ('VAT') rebates are generally permitted under ASCM (as long as the level of rebates does not go beyond the corresponding VAT rates) and have been widely used by WTO Members.[161] This exception does not apply to *import* duty exemptions.[162] However, a duty drawback scheme, i.e. an import duty remission for inputs imported for the production of goods destined for export, falls within the

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157 《国务院关于经济特区和上海浦东新区新设立高新技术企业实行过渡性税收优惠的通知》 [Notice on the Application of Transitional Tax Incentives for Newly-Established High-New Technology Enterprises in Special Economic Zones and Shanghai Pudong New Zone], issued by the State Council on 26 Feb. 2007, available at: www.gov.cn/gongbao/content/2008/content_871687.htm.

158 《关于在服务贸易创新发展试点地区推广技术先进型服务企业所得税优惠政策的通知》[Notice on the Application of Corporate Income Tax Incentives for Advanced Technology Service Enterprises in Pilot Areas for Innovative Development of Service Trade], issued by the Ministry of Finance, the State Taxation Administration, the Ministry of Commerce, the Ministry of Science and Technology and the National Development and Reform Commission on 10 Nov. 2016, available at: www.chinatax.gov.cn/n810341/n810755/c2399212/content.html. The initial 15 pilot areas include Tianjin, Shanghai, Shenzhen, Hangzhou, Hainan, Wuhan, Guangzhou, Chengdu, Suzhou, Weihai, Harbin New Zone, Jiangbei New Zone, Liangjiang New Zone and Guian New Zone.《关于将技术先进型服务企业所得税政策推广至全国实施的通知》[The Notice on the Nationwide Application of Corporate Income Tax Incentives for Advanced Technology Service Enterprises], issued by the Ministry of Finance, the State Taxation Administration, the Ministry of Commerce, the Ministry of Science and Technology and the National Development and Reform Commission on 2 Nov. 2017, available at: www.chinatax.gov.cn/n810341/n810755/c2908867/content.html.

159 Appellate Body Report, *United States – Definitive Anti-Dumping and Countervailing Duties on Certain Products from China* (hereinafter *US – Anti-Dumping and Countervailing Duties (China)*), WT/DS379/AB/R (adopted 25 Mar. 2011), para. 373.

160 See above n 102, Appellate Body Report, *US — Aircraft (2nd complaint)*, paras. 816-831.

161 See generally Youssef Benzarti and Alisa Tazhitdinova, 'Do Value-Added Taxes Affect International Trade Flows? Evidence from 30 Years of Tax Reforms', NBER Working Paper 26195 (Aug. 2019), available at: www.nber.org/system/files/working_papers/w26195/w26195.pdf.

162 The WTO case *Canada – Autos* involved the exemption of import duties for motor vehicles imported by certain Canadian car manufacturers who met prescribed conditions. In upholding the panel's findings, the Appellate Body ruled that this duty exemption led to a situation in which the Canadian government had given up the entitlement to collect revenue from an import duty of 6.1% which was generally applicable to the imports of motor vehicles. See Appellate Body Report, *Canada – Certain Measures Affecting the Automotive Industry*, WT/DS139/AB/R, WT/DS142/AB/R (adopted 19 Jun. 2000), paras. 91-92.

exception provided that the remission does not exceed the import duty actually levied.[163] VAT rebates and duty drawbacks have been a major component of and contributor to China's export promotion policies.[164] Recently, China made some adjustments to its VAT rebate scheme by increasing the rebate rates for eligible exports in general[165] and allowing high-tech firms to use excess input VAT credits.[166] Since the rebate rates are not in excess of the current VAT rate (i.e. 13%), the Chinese VAT scheme remains immune from the subsidy rules, just like similar policies applied by other WTO Members. Nonetheless, it should be noted that such policies are subject to the WTO non-discrimination rules (e.g. GATT Articles I and III). In *China – Value-Added Tax on Integrated Circuits*, for example, China had to cease its discriminatory application of VAT rebates for domestic enterprises in the software and IC industry, allegedly affecting around $2 billion worth of US exports to China.[167] Thus, while the ASCM largely leaves out VAT rebate policies from its coverage, there are other rules that may be applied to restrain the use of such policies. In this regard, the WTO dispute settlement mechanism has proved effective in restraining China's use of subsidies in the high-tech sector and hence should continue to be used for that purpose. To the extent that VAT rebates may distort trade and hurt trading partners, it is for WTO Members to decide whether more discipline would be desirable via negotiations. The current lack of discipline on VAT rebates under the ASCM was agreed by WTO Members and does not cause a deficiency problem specific to China.

iii. Provision of goods or services (other than general infrastructure) or purchase of goods

The third category of "financial contributions" concerns in-kind contributions in two forms: (1) the provision of goods or services to, and (2) the purchase of goods from, an enterprise by governments. While the former may "lower artificially the cost of producing a product by providing … inputs having a financial value", the latter may "increase artificially the revenues gained from selling the product."[168] A series of decisions have shown that goods or services may be provided through the grant of relevant rights leading to the use or enjoyment of the goods or services. For example, in *US – Softwood Lumber IV*, the Appellate Body found that Canada's

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163 WTO Panel Report, *European Union – Countervailing Measures on Certain Polyethylene Terephthalate from Pakistan*, WT/DS486/R (adopted 25 May 2018), paras. 7.29-30; Appellate Body Report, *European Union – Countervailing Measures on Certain Polyethylene Terephthalate from Pakistan*, WT/DS486/AB/R (adopted 25 May 2018), paras. 5.68, 5.97-5.134. PET stands for polyethylene terephthalate. This dispute concerned Pakistan's duty drawback scheme whereby domestic producers of PET were entitled to obtain remissions of import duties otherwise payable on the importation of production inputs provided that such inputs were used for the production of PET destined for export. The Appellate Body ruled that as long as the remission or drawback of import duties did not exceed the duties actually levied on the imported inputs, a duty drawback scheme as such was exempted from being treated as "government revenue foregone" or a "financial contribution" under Footnote 1.

164 See generally Chi-Chur Chao et al., 'China's Import Duty Drawback and VAT Rebate Policies: A General Equilibrium Analysis', (2006)17(4) *China Economic Review* 432.

165 《关于提高部分产品出口退税率的公告》[Notice on Increasing Tax Rebate Rates for Certain Exports], issued by Ministry of Finance and State Taxation Administration on 17 Mar. 2020, available at: www.chinatax.gov.cn/chinatax/n810341/n810755/c5146338/content.html.

166 《关于 2018 年退还部分行业增值税留抵税额有关税收政策的通知》[Notice on Refunds to Excess VAT Credits in Certain Industries in 2018], issued by Ministry of Finance and State Taxation Administration on 27 Jun. 2018, available at: www.chinatax.gov.cn/n810341/n810755/c3556358/content.html. The Notice provided that the ten strategic sectors identified in the MIC 2025 should be prioritized for the refund of excess VAT credits.

167 For an official summary of this dispute, see WTO, *China — Value-Added Tax on Integrated Circuits* (DS309), available at: www.wto.org/english/tratop_e/dispu_e/cases_e/ds309_e.htm. For a discussion of the facts and settlement of the dispute, see Weihuan Zhou, *China's Implementation of the Rulings of the World Trade Organization* (Oxford and Portland, Oregon: Hart Publishing, 2019) 17-19.

168 See above n 103, Appellate Body Report, *US – Soft Lumber IV*, para. 53.

provincial stumpage arrangements amounted to a provision of goods by giving the eligible enterprises the right to cut standing timber and enjoy exclusive rights over the timber harvested.[169] It ruled that the term "provide" requires "a reasonably proximate relationship between the action of the government … and the use or enjoyment of the good or service by the recipient", and also the government to "have some control over the availability of" the thing being provided.[170] Applying this reasoning in *US – Carbon Steel (India)*, the Appellate Body held that the grant of mining rights for iron ore and coal by the Indian government had a "reasonably proximate relationship" with "the use or enjoyment of the minerals by the beneficiaries of those rights."[171] In *US – Aircraft (2nd complaint)*, the Appellate Body ruled that the provision of goods or services may be "done gratuitously or in exchange for consideration" and hence captured the provision of access to NASA/USDOD facilities, equipment and employees in exchange for scientific and technical information produced by Boeing.[172] In the compliance proceedings of this dispute, however, the panel refused to expand the scope of "goods" to cover intangible things – i.e. IPRs – and rejected the EU's claim that the transfer of patent and other IPRs to Boeing constituted provision of goods.[173]

The provision of goods or services in the form of "general infrastructure" is explicitly excluded from the coverage of subparagraph (iii). Thus, a distinction must be made between "infrastructure of a *general* nature" and other infrastructure.[174] In *EC – Aircraft*, the panel observed that "general infrastructure" refers to "infrastructure that is not provided to or for the advantage of only a single entity or limited group of entities, but rather is available to all or nearly all entities."[175] Therefore, even the provision of railroads or electrical distribution systems, for example, may fall within the ambit of subparagraph (iii) if they are made available only to a limited group of entities.[176] Such limitations on access to or use of the infrastructure may arise in law (e.g. where the infrastructure is created for the particular needs of certain entities) or in effect (e.g. where in the absence of an explicit limitation, only certain entities actually have access to the infrastructure).[177] Based on these observations, the panel found sufficient evidence to show that the facilities involved in this case were created for use by Airbus although they were also intended to serve certain public policy goals and may be open for public use in the future.[178]

The provision of production inputs, particularly land and electricity, at preferential rates has been prevalent in the Chinese high-tech sector. For example, the miraculous growth of China's solar

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169 Ibid., paras. 68-76.

170 Ibid., para. 71.

171 See above n 114, Appellate Body Report, *US — Carbon Steel (India)*, paras. 4.60-4.74.

172 See above n 102, Appellate Body Report, *US — Large Civil Aircraft (2nd complaint)*, paras. 616, 623-624.

173 WTO Panel Report, *United States — Measures Affecting Trade in Large Civil Aircraft (2nd complaint) – Recourse to Article 21.5 of the DSU by the European Union*, WT/DS353/RW (adopted 11 Apr. 2019), paras. 8.381-8.390. This finding was not appealed.

174 Appellate Body Report, DS257, para. 60.

175 See above n 109, WTO Panel Report, *EC – Aircraft*, para. 7.1036.

176 Ibid., para. 7.1039.

177 Ibid., para. 7.1043.

178 Ibid., paras. 7.1080-1084. On appeal, the EU contended that the *creation* of infrastructure by a government does not qualify as a "financial contribution". The Appellate Body ruled that the creation of infrastructure is a precondition for the provision of that infrastructure and is relevant to a proper characterization of the infrastructure provided, although a "financial contribution" would not exist if the infrastructure is not ultimately provided to the recipient concerned. See Appellate Body Report, *European Communities and Certain Member States – Measures Affecting Trade in Large Civil Aircraft* (hereinafter *EC — Aircraft*), WT/DS316/AB/R (adopted 1 Jun. 2011), paras. 964-965.

photovoltaics ('PV') sector, at least at its early development stage, was mainly attributable to a large scale of government subsidies including access to cheap lands provided by local governments.[179] In order to attract the world's leading tech firms to establish research centres in the Guangxi Zhuang Autonomous Region, the local government currently provides land use right for free for the first three years and at half price for another two years.[180] Similarly, to accelerate the growth of the Linyi High-Tech Zone in Shandong province, the local government offers a 15% discount of land use fees, preferential access to electricity, water and other essential resources and facilities, amongst a variety of other supportive policies.[181] In Wuhan province, high-tech companies in the Guanggu Future Tech-City are entitled to discounted electricity rates leading to an annual cost saving of approximately RMB 150 million.[182] The Guizhou provincial government has recently reduced the electricity rate to RMB 0.35/Kilowatt hour for big data companies in Guian New Zone and for all 5G base stations in the region (in light of the New Infrastructure Initiative discussed in Section II) while the standard rate for industrial use is between RMB 0.48-0.64/Kilowatt hour.[183] There is little doubt that these measures are input subsidies in the form of provision of goods or services (i.e. electricity distribution and water allocation). Although these subsidies involve land and electricity generation and distribution, only selected industries, projects or companies are eligible for preferential access and discounted rates.

Another major form of input subsidies has been the provision of input materials, such as steel, aluminum, and a range of raw materials and rare earths (e.g. bauxite, iron ores, coking coal) that are essential for the high-tech sector.[184] The key concern here has related to the significant market distortions in these upstream industries which have long been subject to industrial policies and dominated by SOEs. However, this concern is not so much about whether the provision of input

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179 See generally Yongqing Xiong and Xiaohan Yang, 'Government Subsidies for the Chinese Photovoltaic Industry', (2016)99 *Energy Policy* 111; Gang Chen, 'China's Solar PV Manufacturing and Subsidies from the Perspective of State Capitalism', (2015)33(1) *Copenhagen Journal of Asian Studies* 90, 98; Mandy Meng Fang, 'A Crisis or An Opportunity? The Trade War between the US and China in the Solar PV Sector', (2020)54(1) *Journal of World Trade* 103, 107.

180 《广西壮族自治区人民政府关于实施创新驱动发展战略的决定》[Decision on Implementing the Plan of Innovation Driven Development], issued by the Guangxi Zhuang Autonomous Region Government on 22 Sep. 2016, available at: http://gzw.gxzf.gov.cn/ztzl/rdzt/yqgxx/tzzc/t5577064.shtml.

181 《临沂高新技术产业开发区招商引资的有关规定》 [Several Regulations on the Business and Investment Invitation in Linyi High-tech Industrial Development Zone], undated, available at: www.lytoday.com/kfly/yhzc/2013-12/17/content_1600.htm.

182 Hubei Government, 'Provincial Pricing Bureau Actively Uses Pricing Policies to Support High-Tech Industry Development in Hubei', 20 May 2014, available at: www.hubei.gov.cn/xxbs/bmbs/swjj/201405/t20140520_1204265.shtml.

183 It is reported that Huawei, Apple and Tencent will establish their big data centres in Guian New Zone as planned. See People.cn, 'New Infrastructure Brings New Development Opportunities for Big Data Industry in Guizhou', 22 Apr. 2020, available at: http://scitech.people.com.cn/n1/2020/0422/c432330-31683603.html; Guizhou Communications Administration,《贵州出台政策降低 5G 用电成本，推助 5G 产业发展》 [Guizhou Autonomous Prefecture Issued Policy to Reduce the Cost of Electricity Generation for 5G Industry and Promote the Industrial Development', 23 Jul. 2020, available at: http://gzca.miit.gov.cn/xwdt/gzdt/art/2020/art_3b5055f9baab4c5693b7c730ad2edaac.html.

184 See generally OECD, 'A First Look at the Steel Industry in the Context of Global Value Chains', DSTI/SC(2017)4 (16 Mar. 2017), available at: https://one.oecd.org/document/DSTI/SC(2017)4/en/pdf; OECD, 'Measuring Distortions in International Markets: the Aluminum Value Chain', OECD Trade Policy Papers No. 218 (7 Jan. 2019) [hereinafter OECD Aluminum Report], available at: www.oecd-ilibrary.org/trade/measuring-distortions-in-international-markets-the-aluminium-value-chain_c82911ab-en; Wayne M Morrison and Rachel Tang , 'China's Rare Earth Industry and Export Regime: Economic and Trade Implications for the United States' (Congressional Research Service , 30 April 2012) 1-4, available at: https://fas.org/sgp/crs/row/R42510.pdf.

materials constitutes a type of "financial contributions" but about (1) whether the input suppliers are "public bodies" and (2) whether these inputs are supplied at less than adequate remuneration so that a benefit is conferred to the downstream users in the high-tech sector. These two issues will be discussed in the relevant sub-sections below. In practice, energy and material input subsidies have been some of the most frequent targets in countervailing actions against China.[185]

The other category of in-kind contributions under subparagraph (iii) concerns governments' purchase of goods. The case law has clarified that such purchases are usually for consideration[186] and may involve a government acquiring things for own use or for others to use (such as resale to end users of electricity).[187] However, although the text of subparagraph (iii) does not include purchases of "services", in *US – Aircraft (2nd complaint)* the Appellate Body did not endorse the panel's decision that the drafters of the ASCM intended to exclude purchases of services, thereby leaving this question open for discussion in future disputes.[188]

Government procurement has been an important driver of indigenous innovation in China. A series of national policies and regulatory documents, which are also implemented through numerous local government policies, have mandated or encouraged preferential government procurement of high-tech products and services supplied by qualified Chinese entities.[189] The NEV industry, for instance, has been a major beneficiary of such policies which set specific NEV purchase targets for government entities and public institutions at both national and local levels.[190] One of the most recent policy developments is an Opinion issued by the State Council which encourages government entities to increase purchases of innovative technologies, goods and

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185 See generally, Capital Trade Incorporated, 'An Assessment of China's Subsidies to Strategic and Heavyweighted Industries', Submission to the U.S.-China Economic and Security Review Commission (23 Mar. 2009), available at: www.uscc.gov/research/assessment-chinas-subsidies-strategic-and-heavyweight-industries.

186 See above n 102, Appellate Body Report, *US — Large Civil Aircraft (2nd complaint),* para. 620.

187 WTO Panel Report, *Canada – Certain Measures Affecting the Renewable Energy Generation Sector/Measures Relating to the Feed-in Tariff Program* (hereinafter *Canada – Renewable Energy/Feed-in Tariff Program*), WT/DS412/R, WT/DS426/R (adopted 24 May 2013), paras. 7.225-227; Appellate Body Report, *Canada – Certain Measures Affecting the Renewable Energy Generation Sector/Measures Relating to the Feed-in Tariff Program* (hereinafter *Canada – Renewable Energy/Feed-in Tariff Program*), WT/DS412/AB/R, WT/DS426/AB/R (adopted 24 May 2013), para. 5.124.

188 See above n 102, Appellate Body Report, *US — Large Civil Aircraft (2nd complaint)*, para. 620.

189 See eg. 《国家中长期科学和技术发展规划纲要（2006-2020）》[The National Medium- and Long-Term Science and Technology Development Plan for 2006-2020], issued by the State Council on 9 Feb. 2006, available at: www.gov.cn/gongbao/content/2006/content_240244.htm;《自主创新产品政府采购评审办法》[Notice on the Assessment Criteria of Government Procurement of Home-Grown Innovation Products], issued by the Ministry of Finance on 3 Apr. 2007, available at: www.gov.cn/ztzl/kjfzgh/content_883671.htm;《自主创新产品政府采购预算管理办法》[Notice on the Measures of Administrating the Budget of Government Procurement of Home-Grown Innovation Products], issued by the Ministry of Finance on 3 Apr. 2007, available at: www.gov.cn/ztzl/kjfzgh/content_883710.htm. However, it is noted that the latter two policies were phased out in 2011 by the Ministry of Finance. For a summary of some of the national and local policies, see The US-China Business Council, 'Update: China's Innovation & Government Procurement Policies', May 2015, available at: www.uschina.org/reports/update-chinas-innovation-government-procurement-policies. For a general discussion of government procurement in the high-tech sector, see Daniel C.K. Chow, 'China's Indigenous Innovation Policies and the World Trade Organization', (2013)34(1) *Northwestern Journal of International Law & Business* 81 (noting that this study deliberately left out an analysis of whether China's government procurement policies in the high-tech sector may be challenged under the WTO subsidy rules).

190 《关于印发政府机关及公共机构购买新能源汽车实施方案的通知》[Notice on Issuing the implementation Plan of Government Agencies and Public Institutions' Purchases of New Energy Vehicles], issued by the Government Offices Administration of the State Council, the Ministry of Finance, the Ministry of Science and Technology, the Ministry of Industry and Information Technology and the National Development and Reform Commission on 14 Jul. 2014, available at: www.caam.org.cn/chn/9/cate_99/con_5124489.html.

services from medium and small-sized tech firms in High-Tech Industrial Development Zones.[191] It is anticipated that this policy will be implemented in the 168 high-tech zones currently listed by the Ministry of Science and Technology.[192] Like government provision of goods or services, the major issue relating to the preferential public procurement of high-tech goods is not whether it constitutes a "financial contribution" but whether the purchases are made at more than adequate remuneration. Although the issue of whether government purchases of services may be treated as "financial contributions" remains unsettled, this lack of clarity does not create a problem that is specific to China, and any further development of the case law will apply to all WTO Members.

In the meantime, it is worth noting that China is actively negotiating to join the WTO Agreement on Government Procurement which sets forth rules (e.g. non-discrimination) on government procurement activities that are not available under the existing WTO multilateral agreements.[193] Most recently, China has proposed to enhance its market access commitments by broadening the scope of covered procurement such as procuring entities and goods and services sectors including some of the strategic sectors.[194] These rules and commitments would provide additional, more specific discipline on China's government procurement activities, thereby reducing the need to resort to the ASCM.

In addition, China is subject to an even broader WTO-plus obligation regarding the purchase and sale activities of SOEs and State-invested enterprises ('SIEs'). Section 6.1 of the Accession Protocol, as elaborated by paragraph 46 of the Working Party Report, requires the Chinese government to ensure that

> … *all state-owned and state-invested enterprises would make purchases and sales based solely on commercial considerations, e.g. price, quality, marketability and availability*, and that the enterprises of other WTO Members would have an adequate opportunity to compete for sales to and purchases from these enterprises on non-discriminatory terms and conditions. *In addition, the Government of China would not influence, directly or indirectly, commercial decisions on the part of state-owned or state-invested enterprises, including on the quantity, value or country of origin of any goods purchased or sold*, except in a manner consistent with the WTO Agreement. (emphasis added)

While this obligation has never been utilized before (and hence its exact scope remains debatable), it seems to go beyond a mere non-discrimination rule and provide a more comprehensive restriction on the anti-competitive conduct of SOEs and SIEs including government purchases and sales of goods and services.[195] Thus, the ASCM is not, nor is it intended to be, the sole source

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[191] See 《关于促进国家高新技术产业开发区高质量发展的若干意见》 [Several Opinions on Enhancing the High Quality Development of National High-tech Industrial Zones], issued by the State Council on 17 Jul. 2020, available at: www.gov.cn/zhengce/content/2020-07/17/content_5527765.htm.

[192] The catalogue of the High-tech Zones listed in the Ministry of Science and Technology website can be found: www.most.gov.cn/gxjscykfq/.

[193] The Agreement on Government Procurement is a plurilateral agreement that applies to signatories only. Under Article III:8 of the GATT, government procurement is explicitly exempted from the requirement of national treatment. For an official introduction of the agreement, see WTO, 'WTO and Government Procurement', undated, available at: www.wto.org/english/tratop_e/gproc_e/gproc_e.htm. For a discussion of the application of the relevant WTO rules on government procurement in China's high-tech sector, see above n 189, Chow, 'China's Indigenous Innovation Policies and the World Trade Organization', at 98-104.

[194] WTO, 'China Submits Revised Offer for Joining Government Procurement Pact', 23 Oct. 2019, available at: www.wto.org/english/news_e/news19_e/gpro_23oct19_e.htm.

[195] For a more detailed discussion of this obligation (in comparison to GATT Article XVII:1 on State Trading Enterprises), see Weihuan Zhou, Henry Gao and Xue Bai, 'Building A Market Economy Through WTO-Inspired

of discipline on government procurement and sales activities that may cause market distortions and adversely affect other WTO Members.

iv. Income or price support

Article 1.1(a)(2) sets out a residual category, namely, "any form of income or price support" within the meaning of Article XVI of the GATT. According to the Appellate Body, this category has further broadened the "range of government measures capable of providing subsidies".[196] However, the issue of how broad the category would be remains unsettled. In *China – GOES*, the panel rejected an effect-based approach to the determination of "price support". The contested measure was the voluntary restraint agreements ('VRAs') concluded under the *US Steel Import Stabilization Act* 1984 which restricted the volume of steel imports into the US market. China contended that the VRAs effectively raised domestic steel prices, thereby causing a transfer of wealth from steel purchasers to the US steel industry.[197] The panel held that whether a government action constitutes a covered subsidy should be "determined by reference to the action … concerned, rather than … the effects of the measure on a market."[198] More specifically, the term "price support", in the panel's view, "does not include all government intervention that may have an effect on prices, such as tariffs and quantitative restrictions."[199] Rather, it concerns "*direct government intervention in the market with the design to fix the price of a good at a particular level*, for example, through purchase of surplus production when price is set above equilibrium" as opposed to "a random change in price merely being a side-effect of any form of government measure" (emphasis added).[200] Since the VRAs did not involve direct control of price by the US government, the panel rejected China's claim that they constituted a subsidy in the form of price support.[201] To date, this ruling remains the only detailed consideration of the meaning of "income or price support". Nevertheless, the effect-based approach to the determination of subsidies has been consistently rejected in other disputes. For example, in *US – Export Restraints*, the panel refused to treat export restraints as a "financial contribution" (despite their potential trade-distorting effect).[202] Although this interpretation has been criticized for being too narrow,[203] it appears to reflect the balanced approach to the regulation of subsidies as contemplated in the negotiations.[204]

We did not identify any measure that *directly* sets price or income levels in China's high-tech sector. As a result of the case law above, measures that may cause price distortions *indirectly* may not be captured by this residual category. One such measure that has been hotly debated in recent years concerns China's export restraints, mainly in the form of export quotas and taxes, on raw materials

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Reform of State-Owned Enterprises in China', (2019)68(4) *International and Comparative Law Quarterly* 977, 997-1001, 1011-1012.

196 See above n 103, Appellate Body Report, *US – Softwood Lumber IV*, para. 52.

197 WTO Panel Report, *China – Countervailing and Anti-Dumping Duties on Grain Oriented Flat-rolled Electrical Steel from the United States* (hereinafter *China – GOES*), WT/DS414/R (adopted 16 Nov. 2012), paras. 7.35, 7.79.

198 Ibid., para. 7.85.

199 Ibid., para. 7.85.

200 Ibid., para. 7.86.

201 Ibid., para. 7.88.

202 Based on a review of the negotiating record, the panel observed that the coverage of "financial contributions" is confined to the types of measures discussed above. See WTO Panel Report, *United States – Measures Treating Exports Restraints as Subsidies* (hereinafter *US – Export Restraints*), WT/DS194/R (adopted 23 Aug. 2001) paras. 8.62-8.75. Also see above n 102.

203 See eg. above n 97, Muller, *WTO Agreement on Subsidies and Countervailing Measures: A Commentary*, at 125.

204 See above n 101, Appellate Body Report, *US – DRAMs*, para. 115.

and rare earths.[205] While these measures are apparently adopted to protect the security of exhaustible natural resources and the environment,[206] they may cause domestic input prices to fall, thereby conferring a cost advantage on downstream entities in the high-tech sector (such as semiconductors, NEVs).[207] Despite the potential price effects, export restraints do not amount to a government's direct control of price in light of the panel decision in *US – Export Restraints*. Therefore, whether they may constitute a covered subsidy remains debatable.[208]

However, as discussed above, the ASCM is not the sole source of discipline that may be employed to tackle trade-distortive export measures or price distortions. Under the general WTO rules, all export restrictions other than duties, taxes or other charges are prohibited under GATT Article XI:1. Anti-dumping duties have been routinely applied to address price distortions derived from the raw materials market affecting the price of final goods.[209]

In addition, China has undertaken two relevant WTO-plus obligations. Under Section 11.3 of its Accession Protocol, China agrees to "eliminate all taxes and charges applied to exports" except for a list of 84 tariff items including various commodities (such as certain raw materials for the making of steel) which are subject to a bound export duty from 20% to 50%. Many raw materials, such as bauxite, coke, fluorspar, magnesium, silicon metal, zinc, and a wide spectrum of rare earths, are not included in the exception list and hence must not be subject to export taxes. This WTO-plus obligation has been applied to successfully challenge China's export taxes on raw materials and rare earths in two consecutive disputes.[210] This obligation has significantly limited China's policy space in using export taxes for legitimate regulatory goals while other WTO Members are free to and do apply such taxes for similar goals.[211]

Even more broadly, China undertakes to "allow prices for traded goods and services in every sector to be determined by market forces" under Section 9.1 of the Accession Protocol. Only a short list of exempted goods and services – which does not cover the strategic high-tech sectors –

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205 More generally, Bown and Hillman have argued that the lack of discipline on government policies leading to indirect subsidization of downstream industries such as export restraints and rebates of value-added tax should be addressed. See above n 78, Bown and Hillman, 'WTO'ing A Resolution to the China Subsidy Problem', at 568-569, 574.

206 Information Office of the State Council,《中国的稀土状况与政策》[Situations and Policies of China's Rare Earth Industry] (20 Jun. 2012), available at: www.gov.cn/zhengce/2012-06/20/content_2618561.htm.

207 See Marco Bronckers and Keith Maskus, 'China — Raw Materials: A Controversial Step Towards Evenhanded Exploitation of Natural Resources', (2014)13(2) *World Trade Review* 393, 402-404.

208 But see above n 78, Jackson, *World Trade and the Law of the GATT*, at 383-384 (arguing that the negotiating history of GATT Article XVI:1 has suggested that the definition of subsidy may be broadly interpreted to cover indirect subsidies that increase the export of any products).

209 For an illustration, see Appellate Body Report, *European Union – Anti-Dumping Measures on Biodiesel from Argentina*, WT/DS473/AB/R (adopted 26 Oct. 2016). For a detailed discussion of this report, see Weihuan Zhou, 'Appellate Body Report on *EU−Biodiesel*: The Future of China's State Capitalism under the WTO Anti-Dumping Agreement', (2018)17(4) *World Trade Review* 603.

210 See WTO Panel Report, *China – Measures Related to the Exportation of Various Raw Materials*, WT/DS394/R, WT/DS395/R, WT/DS398/R (adopted 22 Feb. 2012); Appellate Body Report, *China – Measures Related to the Exportation of Various Raw Materials*, WT/DS394/AB/R, WT/DS395/AB/R, WT/DS398/AB/R (adopted 22 Feb. 2012). WTO Panel Report, *China – Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum*, WT/DS431/R, WT/DS432/R, WT/DS433/R (adopted 29 Aug. 2014); Appellate Body Report, *China – Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum*, WT/DS431/AB/R, WT/DS432/AB/R, WT/DS433/AB/R (adopted 29 Aug. 2014).

211 Jeonghoi Kim, 'Recent Trends in Export Restrictions on Raw Materials' in OECD, *The Economic Impact of Export Restrictions on Raw Materials* (Paris, OECD Publishing, 2010) 15-20.

may be subject to government pricing or government guidance pricing.[212] Apparently, this obligation has the potential to extend beyond "price or income control" to capture Chinese government intervention in all sectors (other than the few exemptions) where it affects prices directly or indirectly, although its exact scope of application will need to be tested in future disputes.[213] Despite its potential, this obligation has never been utilized by WTO Members to challenge the allegedly wide-ranging activities of the Chinese government, including those through SOEs and SIEs, that may have prevented prices from being "determined by market forces". Therefore, while it is worthwhile for there to be further discussion about whether the ASCM may or should be expanded to apply to export restraints or other types of price-distortive measures that do not explicitly take the form of the covered subsidies, it is also important to recognize that the other WTO rules, particularly the broad China-specific obligations, already offer certain solutions to the challenges arising from State intervention and market distortions in China.

B. Public Body

The interpretation of what constitutes a "public body" under Article 1.1(a)(1) of the ASCM is critical to ensuring that only the conduct of governments is captured. In its landmark decision in *US – Anti-dumping and Countervailing Duties (China)*, the Appellate Body developed a "function/authority-based" approach to the determination of "public body" while rejecting an "ownership-based" approach proposed by the US and adopted by the panel to decide that China's State-owned commercial banks were "public bodies" just because these entities were majority owned or controlled by the Chinese government.[214] More specifically, the Appellate Body ruled that a "public body … must be an entity that possesses, exercises or is vested with governmental authority" to exercise governmental functions.[215] Such authority may be established based on evidence showing "an explicit statutory delegation" or "a sustained and systematic practice".[216] The existence of mere formal links between an entity and government, such as the government holding a majority interest in the entity, in itself is unlikely to be sufficient evidence.[217] However, "where the evidence shows that the formal indicia of government control are manifold, and there is also evidence that such control has been exercised in a meaningful way, then such evidence may permit an inference that the entity concerned is exercising governmental authority."[218] In any event, the determination of whether an entity is a "public body" requires consideration of all relevant characteristics or features of the entity and its relationship with government, and must not be exclusively or unduly based on any single characteristic.[219] While rejecting the panel's interpretative

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[212] See Section 9.2 and Annex 4 of the Accession Protocol. The exemptions include four categories of goods (ie, tobacco, edible salt, natural gas, and certain pharmaceuticals) and four types of services (ie, public utilities, and postal and telecommunication services, entrance fee for tour sites, and education services) subject to government prices; and six categories of goods (ie, grain, vegetable oil, processed oil, fertilizer, silkworm cocoons, cotton) and six types of services (ie, transport services, professional services, commission agents' services, certain banking services, certain prices of residential apartments, and health-related services) subject to government guidance pricing.

[213] For a more detailed discussion of this obligation, see above n 195, Zhou et al., 'Building A Market Economy Through WTO-Inspired Reform of State-Owned Enterprises in China', at 1012-1014.

[214] See above n 159, Appellate Body Report, *US – Anti-dumping and Countervailing Duties (China)*, paras. 277-278.

[215] Ibid., paras. 317-318.

[216] Ibid., para. 318.

[217] Ibid., para. 318.

[218] Ibid., para. 318.

[219] Ibid., para. 319.

approach, the Appellate Body upheld the panel's ultimate finding that the Chinese State-owned commercial banks constituted "public bodies" based on evidence relating to (1) state ownership, (2) laws that mandate or request implementation or consideration of government policies, and (3) influence of the government or the Communist Party of China (hereinafter 'CPC' or 'Party') on management and decision-making.[220]

Most recently, the Appellate Body revisited the "function/authority-based" approach in detail in *US – Countervailing Measures (China) (Article 21.5)*. This dispute arose out of the US's continuous application of the "ownership-based" approach in finding that Chinese SOEs and SIEs providing inputs for the production of certain goods (i.e. certain pipes, steel and aluminium products, wind powers, and solar panels) were "public bodies" in a range of countervailing investigations.[221] The US was found to be in breach of Article 1.1(a)(1) in the original proceedings. In the compliance proceedings, the US primarily relied on a Public Bodies Memorandum (accompanied by a CPC Memorandum) and China's responses to the Public Body Questionnaire, which included evidence to support the "authority-based" approach. In addition to government ownership, the evidence also included, *inter alia*, China's national industrial policies, the role of the Chinese government and the CPC in the firms' management and governance, the provision of direct and indirect benefits to incentivize the firms to follow the policy directives, and the influence of these policies, government/Party role and incentives on the firms' behaviour and activities.[222] The Memorandum concluded to the effect that (1) all SOEs are "public bodies"; (2) SIEs may be subject to government industrial policies, hence exercising governmental functions; (3) entities with little or no formal government ownership may be controlled or influenced by the Chinese government in a meaningful manner; and (4) the control of the Party is equivalent to the control of the State.[223] China's core contention was that the US authorities failed to apply the correct legal test. More specifically, China submitted that the "authority-based" test "require[s] a particular degree or nature of connection in all cases between an identified government function and the particular financial contribution at issue", and hence cannot be satisfied by "an abstract review of China's system of governance and state functions".[224] Both the compliance panel and the Appellate Body disagreed. The Appellate Body clarified that the focus of the test is on the *entity* concerned and its relationship with government as opposed to the *conduct* alleged to give rise to a "financial contribution" (although evidence relating to conduct may be indicative of the underlying functions of the entity).[225] Therefore, it is unnecessary to show that the entity is "meaningfully controlled" by the government in the *specific* conduct.[226] Once an entity is found to be a "public body", then all its conduct "is *directly* attributable to" the government of the Member concerned (original emphasis).[227] Although the Appellate Body refused to consider whether the Public Bodies

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220 Ibid., paras. 350, 355.

221 WTO Panel Report, *United States – Countervailing Duty Measures on Certain Products from China* (hereinafter *US – Countervailing Measures (China)*), WT/DS437/R (adopted 16 Jan. 2015), para. 7.1.

222 WTO Panel Report, *United States – Countervailing Duty Measures on Certain Products from China – Resources to Article 21.5 of the DSU by China* (hereinafter *US – Countervailing Measures (Article 21.5 – China)*), WT/DS437/RW (adopted 15 Aug. 2019), paras. 7.39-7.48.

223 Ibid., paras. 7.49-7.52; Appellate Body Report, *United States – Countervailing Duty Measures on Certain Products from China – Resources to Article 21.5 of the DSU by China* (hereinafter *US – Countervailing Measures (Article 21.5 – China)*), WT/DS437/AB/RW (adopted 15 Aug. 2019), paras. 5.56-5.58.

224 See above n 223, Appellate Body Report, *US – Countervailing Measures (Article 21.5 – China)*, paras. 5.65, 5.77-5.78.

225 Ibid., paras. 5.100-5.101.

226 Ibid., para. 5.103.

227 Ibid., para. 5.103.

Memorandum is *as such* in violation of Article 1.1(a)(1),[228] its decision suggested that evidence showing a sufficient degree of government control of the activities of an entity in general leading to the exercise of governmental functions by the entity would satisfy the "authority-based" test.[229]

The "authority-based" test has been one of the most criticized elements of the current subsidy rules. Many believe that given China's State-led economic model and the dominant role of SOEs in economic activities, this test has created a substantial hurdle to the finding of "public bodies" and hence a striking deficiency in tackling subsidies granted via SOEs.[230] This issue is a major ground for reforms of the subsidy rules proposed by the US-EU-Japan joint statement[231] and by Bown and Hillman.[232]

As one of the authors has argued in detail elsewhere, the "authority-based" approach is preferable to the "ownership-based" approach. This is because under the "authority-based" approach, the definition of "public body" does not overreach so as to cover all SOEs or SIEs regardless of whether an entity exercises a public policy function as an agent of governments or purely engages in commercial activities.[233] Given the fact that State sectors remain significant in many countries,[234] an adoption of the "ownership-based" approach may well attract the same degree of criticisms as its counterpart has received. More importantly, the WTO tribunals' application of the "authority-based" approach has been reasonably balanced by requiring some evidence beyond ownership without imposing excessively high evidentiary standards. China's industrial policies, directives and other regulatory instruments as well as information on the involvement of the State/Party in corporate management and governance, as the major evidence required under the legal test, have been widely documented and are readily accessible nowadays. In addition, China's ongoing SOE reforms have explicitly classified certain entities as Public Welfare SOEs and Special Commercial SOEs to undertake governmental functions, and have mandated the creation of a Party Committee in all SOEs to influence the decision-making of these entities.[235] These recent developments have provided more positive evidence to support findings of "public bodies". In reality, investigating authorities in major jurisdictions have already collected abundant evidence and have often resorted to other relevant evidence collected by each other in countervailing investigations. Significantly, the Appellate Body's ruling that the "public body" determination does not require one to show

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228 Ibid., paras. 5.121-126.

229 Ibid., paras. 5.121-126, 5.245-248. One Member of the Appellate Body had a dissenting view on the legal test. The point of disagreement concerned the rigidity and lack of clarity of the "authority-based" approach, which in the view of this Member, "seemed to undermine of the role of that element." In an attempt to relax and broaden the legal test, this Member believed that an entity that has a "sufficiently close" relationship with government should be found to be a "public body", and that the exercise of government authority or function is merely one way to establish such relationship and should not be treated as "*the* essential criterion in every case". (original emphasis) More specifically, as long as "the government has the ability to control that entity and/or its conduct to convey financial value", the entity should be found to be a "public body" regardless of whether it is vested with an authority to exercise governmental functions.

230 See eg. Michel Cartland, Gerard Depayre and Jan Woznowski, 'Is Something Going Wrong in the WTO Dispute Settlement?', (2012)46(5) *Journal of World Trade* 979, 1001-1005; Mark Wu, 'The "China, Inc." Challenge to Global Trade Governance', (2016)57(2) *Harvard International Law Journal* 261, 301-305.

231 See above n 15.

232 See above n 78, Bown and Hillman, 'WTO'ing A Resolution to the China Subsidy Problem', at 567-574.

233 See above n 195, Zhou et al., 'Building A Market Economy Through WTO-Inspired Reform of State-Owned Enterprises in China', at 1017-1020.

234 See OECD, 'State-Owned Enterprises as Global Competitors: A Challenge or an Opportunity?' (Paris: OECD Publishing, 2016) 21-26.

235 See above n 195, Zhou et al., 'Building A Market Economy Through WTO-Inspired Reform of State-Owned Enterprises in China', at 984-986.

that specific conduct of the entity concerned is "meaningfully controlled" by the Chinese government has further reduced the evidentiary burden on investigating authorities. Therefore, the totality of the evidence above would be sufficient to establish a *prime facie* case which would be difficult for the Chinese government to rebut. As shown above, in both of the disputes in which the "authority-based" approach was developed and applied, the tribunals did not disagree with the investigating authorities on the findings that the evidence on the record was sufficient to show China's State banks and SOEs/SIEs providing inputs to manufacture were meaningfully controlled by the Chinese government to exercise governmental functions. Similarly, it would not be hard to establish that the investment funds discussed in sub-section A(i) above are "public bodies" based on the majority ownership of the Chinese government,[236] the relevant industrial policies, and other evidence showing that they are essentially government investment vehicles vested with the authority to promote the growth of the selected industries. In short, while one may continue to debate the legitimacy and efficacy of the "authority-based" test, the case law seems to have evolved in a direction that makes "public bodies" easier to prove than to defend.

C. Private Entities "Entrusted or Directed"

While the ASCM is primarily concerned with the conduct of governments, it does not ignore the possibility that Members may circumvent their obligations by making a financial contribution *indirectly* through a private entity. To prevent such circumvention, Article 1.1(a)(1)(iv) provides that the conduct of a private entity may also constitute the provision of subsidies if it is "entrusted" or "directed" by governments to do so.[237] The key interpretative issue, therefore, concerns the meaning of "entrustment" and "direction". In *US – DRAMs*, the Appellate Body observed that these terms, respectively, involve the giving of responsibility to (i.e. entrustment) or exercise of authority over (i.e. direction) an entity, as a proxy of government, in both formal and informal ways "in order to effectuate a financial contribution."[238] Both terms require "a demonstrable link between the government and the conduct of the private body" and "a more active role [of the government] than mere acts of encouragement", and hence do not cover any government intervention which may or may not lead to the conduct of the private entity.[239] In this regard, the panel found that despite (1) the existence of a bailout policy seeking to prevent the financial collapse of Hynix and (2) the fact that the Korean government had some capacity to influence the private body creditors, the evidence did not demonstrate that the Korean government "availed itself of that capacity to entrust or direct" the creditors to participate in the bailout.[240] The Appellate Body overturned the panel's finding on the ground that the panel examined individual

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236 For example, the major shareholders of the first tranche of the IC Fund included the Ministry of Finance (25.95%), China Development Bank Finance (23.07%), China National Tobacco (14.42%), and Beijing E-Town International Investment and Development (7.21%), and China Mobile (7.21%). See Yanpeng Chen, 'The Second Tranche of the National IC Fund Continues to Focus on Semiconductors and May Attract More Than 1 Trillion Private Investment', Sina News (16 Jun. 2020), available at: https://finance.sina.com.cn/roll/2020-06-16/doc-iirczymk7375390.shtml.

237 See above n 103, Appellate Body Report, *US – Softwood Lumber IV*, para. 52.

238 See above n 101, Appellate Body Report, *US – DRAMs*, paras. 110-111, 113.

239 Ibid., paras. 112, 114.

240 WTO Panel Report, *United States – Countervailing Duty Investigation on Dynamic Random Access Memory Semiconductors (DRAMs) from Korea* (hereinafter *US — DRAMs*), WT/DS296/R (adopted 20 Jul. 2005), para. 7.177. Hynix Semiconductor Inc. ('Hynex'), the successor of Hyundai Electronics, was one of the two major producers of semiconductors (including dynamic random access memory semiconductors ('DRAMs')) in Korea, the other being Samsung Electronics Co., Ltd.

pieces of evidence in isolation rather than the totality of the evidence.[241] However, the Appellate Body did not consider whether the evidence before the panel, in its totality, was sufficient to substantiate "entrustment or direction".

Subsequent decisions have offered more guidance on the evidentiary standard for "entrustment" and "direction". For example, in dealing with similar issues relating to the participation of private body creditors in the bailout of Hynix in *Japan – DRAMs (Korea)*, the Appellate Body dismissed the panel's observation that entrustment or direction cannot be established if a financial transaction (such as a loan) is undertaken on commercial terms, although "the commercial unreasonableness of the financial transactions is a relevant factor".[242] Instead, the Appellate Body opined that a "government could entrust or direct a creditor to make a loan, which that creditor then does on commercial terms."[243] This suggests that the establishment of "entrustment" or "direction" does not rely on whether the financial contribution concerned has conferred a benefit (which is a separate legal element). Moreover, in the context of interpreting "public body" in *US – Anti-dumping and Countervailing Duties (China)*, the Appellate Body confirmed that like the term "public", the term "private" also "encompass[es] notions of authority as well as of control".[244] The major difference, as suggested by the Appellate Body in *US – Countervailing Measures (China) (Article 21.5)*, is that if conduct is carried out by a private entity, then it must be demonstrated that there is a "link between the government and that [specific] conduct" in the form of "entrustment or direction" (which is not required in the determination of "public body" as discussed above).[245] Accordingly, in *US – Supercalendered Paper*, the panel held that a measure that merely imposed a general obligation on an entity to provide electricity service did not amount to an "entrustment or direction" of the entity to provide such service to a specific customer at any given rate.[246] This ruling has confirmed that "entrustment or direction cannot be inadvertent or a mere by-product of governmental regulation"[247] and that additional evidence is needed to show the *conduct* concerned is entrusted or directed by a government.

The concern about the role of private entities in China has two major, related claims. The more extreme claim is that given the complicated web of relationships between the State, the Party and firms in China, all firms may be influenced by the government.[248] This claim indicates that the entire Chinese economy is distorted by State intervention. While one cannot deny that such State/Party-Firm relationships or networks exist, evidence on the actual (or even potential) impact on the decisions of private firms is much less robust compared with the evidence on such impact on SOEs.[249] In contrast, recent studies tend to suggest the opposite. As leading China expert Nicholas Lardy has observed, with the increasingly significant role of private firms in the Chinese

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241 See above n 101, Appellate Body Report, *US – DRAMs*, paras. 141-158.
242 See above n 108, Appellate Body Report, *Japan – DRAMs (Korea)*, para. 138.
243 Ibid., para. 138.
244 See above n 159, Appellate Body Report, *US – Anti-dumping and Countervailing Duties (China)*, para. 292.
245 See above n 223, Appellate Body Report, *US – Countervailing Measures (Article 21.5 – China)*, para. 5.103.
246 WTO Panel Report, *United States – Countervailing Measures on Supercalendered Paper from Canada* (hereinafter *US – Supercalendered Paper*), WT/DS505/R (adopted 5 Mar. 2020), paras. 7.57-63.
247 See above n 101, Appellate Body Report, *US – DRAMs*, para. 114; above n 246, WTO Panel Report, *US – Supercalendered Paper*, para. 7.61.
248 See above n 230, Wu, 'The "China, Inc." Challenge to Global Trade Governance', at 264-265.
249 See eg. Li-Wen Lin, 'A Network Anatomy of Chinese State-Owned Enterprises', (2017)16(4) *World Trade Review* 583.

economy, "most markets are now competitive".[250] Even with the recent resurgence of the role of the State and SOEs, State influence has remained concentrated in selected sectors and private firms have continued to maintain financial performance and efficiency at levels considerably higher than those of SOEs.[251] Moreover, State-firm relationships also exist in developed countries and some major emerging markets. For example, the US National Aeronautics and Space Administration ('NASA') has collaborated with selected US firms to advance space technologies and maintain the US's world leadership in this sector.[252] The government of South Korea has long had a close relationship with firms in the semi-conductor sector, in addition to the provision of subsidies, which has contributed to fostering the country's global competitiveness in this sector.[253] Thus, it is unjustified to regard all business activities of private firms as being directed by the Chinese government. Rather, whether such activities may be so directed or influenced must be established on a case-by-case basis. This view lends support to the interpretative approach developed by the Appellate Body requiring the demonstration of "entrustment" or "direction" of the specific conduct concerned.

The other claim is that given the industrial policies and the significant involvement of the State in market activities in selected sectors including the high-tech sector, private firms are incentivized to increase business activities in these sectors and even to grant financial or other support to certain firms or projects pursuant to the instructions of governments in exchange for business opportunities and other commercial benefits. This claim is not illegitimate if one considers China's New Infrastructure Initiative and government-led investment funds in the high-tech sector which have promoted massive and growing private investment in the selected industries as discussed earlier.[254] However, the possibility that private actors may be so incentivized does not necessarily mean they are acting in the interest of the government instead of their own. Maintaining a good relationship with governments, making an investment based on policy and regulatory developments, or running a short-term loss for long-term benefits are typical examples of reasonable commercial decisions. Such conduct, in itself, is by no means conclusive as to whether a private entity exercises a governmental function. Again, an inquiry into whether the contested conduct is entrusted or directed by governments would be needed.

To this end, one may remain concerned about the "invisible hand" of the State/Party in the Chinese economy which may effectively influence the conduct of private firms in similar ways to how it influences State entities.[255] However, whether the degree, breadth and effectiveness of such influence is actually similar requires more solid empirical evidence. In reality, the Chinese government is significantly more inclined to use SOEs, rather than private entities, for policy

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250 See Nicholas Lardy, *Markets over Mao: The Rise of Private Business in China* (Washington DC: Peterson Institute for International Economics, 2014) 17, 23-51.

251 See Nicholas Lardy, *The State Strikes Back: The End of Economic Reform in China* (Washington DC: Peterson Institute for International Economics, 2019) 1-80.

252 See NASA, 'NASA Announces US Industry Partnership to Advance Moon, Mars Technology', 31 Jul. 2019, available at: www.nasa.gov/press-release/nasa-announces-us-industry-partnerships-to-advance-moon-mars-technology/.

253 See generally S. Ran Kim, 'The Korean System of Innovation and the Semiconductor Industry: A Governance Perspective', (1998)7(2) *Industrial and Corporate Change* 275.

254 It is estimated that the IC Fund (first tranche and second tranche) can lead to private investment exceeding RMB 1 trillion. See above n 236, Chen, 'The Second Tranche of the National IC Fund Continues to Focus on Semiconductors and May Attract More Than 1 Trillion Private Investment'.

255 See generally Curtis J. Milhaupt and Wentong Zheng, 'Beyond Ownership: State Capitalism and the Chinese Firm', (2015)103 *Georgetown Law Journal* 665.

purposes, hence the extensive support for the former to the detriment of the latter.[256] This also suggests that the conduct of private entities must not be presumed to be entrusted or directed by governments. Accordingly, it is submitted that the current law on subsidies strikes a proper balance by including private entities as potential suppliers of subsidies but in the meantime imposing a higher evidentiary standard for establishing that such entities actually act for the government (compared with the evidence required in establishing SOEs as "public bodies"). This balanced approach reasonably reflects the focus of WTO rules on the conduct of governments as opposed to that of corporate entities especially private ones.[257] The more remotely an entity is related to a government, the higher the evidentiary standard should be in establishing that the conduct of the entity is attributable to the government. To the extent that this higher evidentiary standard makes it more difficult for a complainant to prove "entrustment" or "direction" than for a respondent to defend, this difficulty applies to all WTO Members as amply demonstrated in past disputes such as those involving Korea's bailout of Hynix through private creditors. Therefore, even accepting that the current legal test has created certain problems (due to the high evidentiary standard) in tackling the provision of subsidies through private entities, they are not specific to China.

D. Benefits Conferred

A government action that constitutes a "financial contribution" (or "price or income support") would not be regarded as a "subsidy" unless it has conferred a benefit to the recipient under Article 1.1(b) of the ASCM. In developing the legal test of "benefit conferred", WTO tribunals have relied on Article 14 as an immediate context. In essence, Article 14 states that the calculation of benefit shall be based on the extent to which a financial contribution has been made "on terms more favourable than those available to the recipient in the market."[258] Accordingly, the test of "benefit conferred" focuses on the "recipient" or "benefit to the recipient" rather than the government/subsidy provider or "cost to government".[259] Thus, in *EC – Aircraft*, the mere fact that government investment in infrastructure exceeded its return on that investment, though relevant, was not determinative of whether a benefit had been conferred.[260] Rather, one needs to compare the situations with or without the government action, that is, whether the action has made the recipient "better off" than it would have been in the absence of it.[261] The benchmark for comparison is the marketplace such that the central inquiry is whether a financial contribution is provided "on terms more advantageous than those [that would have been] available to the recipient in the market" at the time the contribution is made.[262] Therefore, for example, if the financial

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256 See eg. Benn Steil and Benjamin Della Rocca, 'Does China's "Invisible Hand" Steer Funds to State-Owned Firms', Council on Foreign Relations (16 Apr. 2019), available at: www.cfr.org/blog/does-chinas-invisible-hand-steer-funds-state-owned-firms.

257 See John H. Jackson, William J. Davey, and Alan O. Sykes, *Legal Problems of International Economic Relations – Cases, Materials and Text* (St. Paul, Minn.: West Group, 4th ed., 2002) at 402; Ernst-Ulrich Petersmann, "GATT Law on State Trading Enterprises: Critical Evaluation of Article XVII and Proposals for Reform" in Thomas Cottier and Petros Mavroidis (eds), *State Trading in the Twenty-First Century* (The University of Michigan Press, 1998) 71-96 at 71-72.

258 Appellate Body Report, *Canada – Measures Affecting the Export of Civilian Aircraft* (hereinafter *Canada – Aircraft*), WT/DS70/AB/R (adopted 20 Aug. 1999), paras. 155, 158.

259 Ibid., paras. 154-156.

260 See above n 178, Appellate Body Report, *EC – Aircraft*, paras. 980-981.

261 See above n 258, Appellate Body Report, *Canada – Aircraft*, para. 157.

262 Ibid.; above n 178, Appellate Body Report, *EC – Aircraft*, para. 706; above n 102, Appellate Body Report, *US — Large Civil Aircraft (2nd complaint)*, para. 636.

contribution is in the form of a government loan, then it would constitute a subsidy only if it has been granted on terms more favourable than those of a comparable commercial loan in the market at the time the loan is provided.[263] This timing requirement means that "the determination of benefit … is an *ex ante* analysis that does not depend on how the particular financial contribution actually performed after it was granted."[264] The benchmark analysis requires consideration of all relevant evidence including, *inter alia*, "the terms that would result from unconstrained exchange in the relevant market", and/or the commercial rationality of the financial contribution concerned (that is, whether the contribution is made based on commercial considerations).[265]

One of the most controversial issues in the benefit/benchmark analysis concerns the determination of an appropriate benchmark, especially when a market is dominated or heavily influenced by governments.[266] In *US – Softwood Lumber IV*, the US authority found that Canadian stumpage fees did not reflect competitive market prices and hence used external benchmarks to determine the magnitude of benefit under Article 14(d) (which sets forth the guideline for assessing whether government provision/purchase of goods is made "less/more than adequate remuneration").[267] The Appellate Body ruled that while the private prices in arm's length transactions in the market of provision provide the primary benchmark, such prices may be replaced by an alternative benchmark if they are distorted because the government plays a *predominant* role in providing those goods.[268] In such circumstances, private suppliers would be induced to align their prices to the government price.[269] However, government predominance in the market does not necessarily mean all prices are distorted; hence, whether that predominance has induced price alignment must be assessed on a case-by-case basis.[270] The Appellate Body observed that alternative benchmarks may include the prices of similar goods in world markets (i.e. out-of-country benchmark) or proxies constructed on the basis of production costs (i.e. constructed benchmark).[271] Where an alternative benchmark is employed, adjustments must be made to ensure the benchmark reflects the prevailing market conditions in the country of provision/purchase.[272] These rulings have been applied and further developed in subsequent cases.

While the benefit/benchmark test is still evolving, it clearly involves two major steps: (1) determining an appropriate benchmark, and if an external benchmark is employed,[273] (2) making adjustments to that benchmark to ensure it reflects the prevailing conditions in the market of the

263 See above n 178, Appellate Body Report, *EC – Aircraft*, paras. 834-835.
264 Ibid., para. 706.
265 See above n 108, Appellate Body Report, *Japan – DRAMs (Korea),* para. 172.
266 See generally Wentong Zheng, 'The Pitfalls of the (Perfect) Market Benchmark: The Case of Countervailing Duty Law', (2010)19 *Minnesota Journal of International Law* 350; Julia Qin, 'Market Benchmarks and Government Monopoly: The Case of Land and Natural Resources under Global Subsidies Regulation', (2019)40(3) *University of Pennsylvania Journal of International Law* 575. For a more general critique of the benchmark analysis, see Andrew Lang, 'Governing 'As If': Global Subsidies Regulation and the Benchmark Problem', (2014)67(1) *Current Legal Problems* 135.
267 See above n 103, Appellate Body Report, *US – Softwood Lumber IV*, para. 77.
268 Ibid., para. 90.
269 Ibid., para. 100.
270 Ibid., para. 102.
271 Ibid., para. 106.
272 Ibid., para. 108.
273 Note that a constructed benchmark may involve the use of out-of-country cost information if the in-country production cost is found to be distorted due to government intervention in the relevant upstream market.

subsidizing Member. These two steps may pose challenges for the establishment of "benefit conferred".

The first step requires evidence to show that the primary benchmark, such as prices of final goods or inputs or commercial loan rates in the market of the subsidizing Member, is distorted and hence needs to be replaced with an external benchmark. This evidentiary requirement concerns whether the role of governments in the market is so significant as to render the primary benchmark distortive and unreliable. While governments do play such a significant role in some markets, their role is less significant in other markets. For example, in *US – Anti-dumping and Countervailing Duties (China)*, the WTO tribunal was requested to consider whether the provision of hot-rolled steel ('HRS') inputs to certain Chinese HRS producers via SOEs had conferred a benefit. For the tribunal, the fact that the Chinese government accounted for 96.1% of HRS production in China was sufficient to justify the use of alternative benchmarks.[274] The tribunal also found that the interest rates for commercial loans in China were distorted based on the totality of the following evidence: (1) the government's influence in the banking sector and on interest rates; (2) lending rates were largely undifferentiated and close to the government-set benchmark rate for most loans; (3) both domestic and foreign banks were subject to the same government controls; and (4) the dominant role of State-owned banks in lending activities while privately-owned banks only accounted for a very small percentage of total lending.[275] In making these findings, the Appellate Body emphasized that it is price distortion that would allow the use of alternative benchmarks, not the role of the government *per se*.[276] It also clarified that the evidence required to prove such distortion may vary depending on the degree of government intervention, and such intervention "does not refer exclusively to market shares, but may also refer to market power".[277] These rulings suggest that in sectors in which private actors are more significant than State actors, more compelling evidence on market distortion would be needed. This would be the case in China's high-tech sector, such as semiconductors, NEVs, 5G, big data, AI, etc. in which private firms have been increasing both market shares and market power through myriads of investments.[278] This market situation, compared with the situation in the industries dominated by State actors (such as the steel industry and the energy and resources sector), would entail a higher burden in substantiating that the provision of goods or services or equity infusion by the private entities, for example, is based on distorted terms and conditions due to government influence so that recourse to alternative benchmarks is warranted. The potential difficulties in proving in-country price distortion may only increase if one considers the general position of the Appellate Body that the circumstances that would permit the replacement of in-country private prices are "very limited" under the ASCM,[279] and consequently a series of cases in which the use of an external benchmark

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274 See above n 159, Appellate Body Report, *US – Anti-Dumping and Countervailing Duties (China),* paras. 454-458.

275 Ibid., paras. 503, 508.

276 Ibid., para. 446.

277 Ibid., paras. 443-444.

278 A recent report of China Semiconductor Industry Association on 'The Ten Most Competitive Chinese Companies in the Semi-conductor Industry in 2019' shows that private companies have made up a significant portion in the sector, including design of integrated circuit, semi-conductor manufacturing, semi-conductor testing and packaging, semi-conductor materials, etc. The list is available at: www.csia.net.cn/Article/ShowInfo.asp?InfoID=95565. In the NEV sector, private companies such as BYD, Geely are becoming the leaders in the market. See China Daily, 'China's Top 10 Selling New Energy Cars' (12 Oct. 2018), available at: www.chinadaily.com.cn/a/201810/12/WS5bbfd4c5a310eff303281e78_4.html.

279 See eg. above n 223, Appellate Body Report, *US – Countervailing Measures (Article 21.5 – China)*, para. 5.137. In this dispute, the WTO tribunal found that the US had failed to adduce sufficient evidence to establish that the in-

was difficult to justify even when a government held a monopolistic position in the relevant market.[280]

The second step requires adjustments to be made to a selected external benchmark to reflect the prevailing market conditions in the subsidizing Member. This requirement is explicitly set out in Article 14(d) which contemplates certain factors for adjustments including price, quality, availability, marketability, transportation and other conditions of purchase or sale of goods or services in the country of provision or purchase. Such adjustments are also required under the other sub-paragraphs of Article 14. For example, in *US – Anti-dumping and Countervailing Duties (China)*, the Appellate Body held that for the purpose of Article 14(b) a benchmark may be employed if "loans in a given market and in a given currency are distorted by government intervention"; however, such a benchmark must be adjusted to approximate "a comparable commercial loan which the firm could actually obtain on the market", taking into account factors "such as date of origination, size, maturity, currency, structure, or borrower's credit risk."[281] The difficulties in making these adjustments do not lie in the need to ensure that the comparison between the selected benchmark and the contested financial contribution is at the same level of trade.[282] Rather, the difficulties relate to how to make an adjustment which reflects the prevailing conditions of a market so distorted by government intervention as to render the terms and conditions of private transactions in that market unreliable. In other words, if the use of an out-of-country benchmark is intended to remove the in-country market distortions, then making an adjustment to reflect the in-country market conditions may reintroduce such distortions into the benchmark, at least to some extent. In this regard, the Appellate Body has explained that "prevailing market conditions" refer to the terms and conditions determined by market forces, which may include commercial activities of both private and government-related entities.[283] This confirms that the adjustments would need to distinguish between market-based terms and conditions and those distorted by government intervention or even to establish a counterfactual market in the absence of such distortions. This would be a formidable task for which the case law has not provided sufficient guidance. To make it even worse, the Appellate Body opined, in *US – Softwood Lumber IV*, that the adjustments must reflect and maintain the comparative advantage of the subsidizing Member so that countervailing measures are not imposed to "offset differences in comparative advantages between countries."[284] While this is an enlightening remark, it tends to make the legal requirements on the adjustments of benchmarks even more obscure and difficult to apply, and may drag WTO Members into endless debate about what constitutes a comparative advantage, to what extent such an advantage may be created by governments, etc.[285]

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country private prices in the Chinese steel and PV sectors were distorted by government intervention (paras. 5.163-5.203).

280 See above n 266, Qin, 'Market Benchmarks and Government Monopoly: The Case of Land and Natural Resources under Global Subsidies Regulation', at 587-606.

281 See above n 159, Appellate Body Report, *US – Anti-Dumping and Countervailing Duties (China)*, paras. 484-486.

282 For example, in *US – Carbon Steel (India)*, the Appellate Body considered that when ex-factory benchmark prices are used, an adjustment must be made to include the transportation costs generally applicable in the country of origin. See above n 114, Appellate Body Report, *US – Carbon Steel (India)*, paras. 4.246-4.249.

283 Ibid., paras. 4.150-151.

284 See above n 103, Appellate Body Report, *US – Softwood Lumber IV*, para. 109.

285 See above n 266, Qin, 'Market Benchmarks and Government Monopoly: The Case of Land and Natural Resources under Global Subsidies Regulation', at 613-615.

These challenges associated with the application of the benefit/benchmark test are, again, not specific to China but have arisen in disputes between other WTO Members, as demonstrated above. As far as China is concerned, however, these challenges may be addressed through China's WTO-plus commitment under Section 15(b) of the Accession Protocol. That provision states:

> In proceedings under Parts II, III and V of the SCM Agreement, when addressing subsidies described in Articles 14(a), 14(b), 14(c) and 14(d), relevant provisions of the SCM Agreement shall apply; however, *if there are special difficulties in that application, the importing WTO Member may then use methodologies for identifying and measuring the subsidy benefit which take into account the possibility that prevailing terms and conditions in China may not always be available as appropriate benchmarks*. In applying such methodologies, where practicable, the importing WTO Member should adjust such prevailing terms and conditions before considering the use of terms and conditions prevailing outside China. (Emphases added.)

Although this provision has never been applied before, it arguably has the potential to considerably soften the legal requirements for the benchmark analysis under the ASCM, precisely in the two major steps. In the first step, it provides the flexibility for investigating authorities to employ an external benchmark as long as they find it difficult to decide the magnitude of benefits by reference to the terms and conditions in the Chinese market. The scope of "special difficulties" is not circumscribed in any way, thereby leaving wide latitude for the authorities to decide that such difficulties exist.[286] For example, one may argue that given the massive government investment fund in a particular high-tech sector, it would be difficult to ascertain whether equity infusion by private entities is based on terms and conditions unaffected by the activities of governments. In any event, the evidentiary requirements under the test of "special difficulties" would be much less onerous than those under Article 14 of the ASCM. In the second step, the obligation to make adjustments to a selected benchmark is reduced to a non-obligatory best-endeavours requirement which merely encourages authorities to do so "where practicable". Like in the first step, no matter how the term "practicable" is interpreted, it would be less onerous leaving room for investigating authorities to exercise discretion. Applying the example above, if a "special difficulty" is established due to the involvement of the government investment fund in a high-tech sector, the same difficulty may be used to show that adjustments are not "practicable" as it is practically difficult to identify undistorted terms and conditions. Even in cases where China adduces sufficient evidence to show that such adjustments are practically doable, one would have to decide whether the best-endeavours language should otherwise be mandatory. Overall, it is submitted that Section 15(b) of the Accession Protocol has significantly relaxed the high standards developed by WTO tribunals in determining "benefits conferred", making it much easier for WTO Members to tackle Chinese subsidies through countervailing actions.

E. Specificity

A subsidy that is not "prohibited"[287] is not actionable or countervailable unless it is "specific" within the meaning of Article 2. This specificity requirement is intended to exclude subsidies that are "broadly available and widely used throughout an economy" from the ASCM.[288] It essentially

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286 See above n 195, Zhou et al., 'Building A Market Economy Through WTO-Inspired Reform of State-Owned Enterprises in China', at 1015.

287 Export subsidies and local content subsidies are deemed "specific" under Article 2.3 of the ASCM.

288 WTO Panel Report, *United States – Subsidies on Upland Cotton*, WT/DS267/R (adopted 21 Mar. 2005), para. 7.1143.

concerns whether a subsidy is made available only to "certain enterprises" or "geographical regions" in law or in fact, with a focus on "limitations on eligibility".[289] Thus, a subsidy is *de jure* specific if the access to or eligibility for it is *explicitly* limited to certain enterprises (Article 2.1(a)). In contrast, if the eligibility is automatic based on objective criteria or conditions, then the subsidy is ostensibly non-specific (Article 2.1(b)). However, an ostensibly non-specific subsidy may be found to be, in fact, specific in a particular case.[290] *De jure* specificity would usually rely on a written instrument whereas unwritten subsidy measures would typically trigger an inquiry into *de facto* specificity.[291] To establish *de facto* specificity, one would need to demonstrate "a systematic series of actions pursuant to which financial contributions that confer a benefit have been provided to certain enterprises."[292] All evidence/factors relating to "specificity" and "non-specificity" must be considered.[293]

Under the chapeau of Article 2.1, "certain enterprises" include "an enterprise or industry or group of enterprises or industries". While an enterprise refers to a firm or business, an industry generally "relates to producers of certain products".[294] A subsidy is specific if eligible beneficiaries are limited to "certain enterprises", regardless of whether similar subsidies are also granted to certain other enterprises.[295] In *US – Anti-dumping and Countervailing Duties (China)*, for example, the Appellate Body upheld the panel's finding that the provision of State loans by the Chinese government to the off-the-road (OTR) tyres industry was specific based on the following evidence: (1) the Eleventh Five-Year Plan which set forth an overarching initiative to support the auto parts industry; (2) the foreign investment regime which categorized certain relevant projects in the industry as "encouraged", thereby directing government support for those projects; and (3) corresponding planning documents at local levels which explicitly mandated the grant of policy loans to such projects.[296] This finding of specificity was not affected by the fact that these planning documents and the "encouraged" category also encompassed other selected industries or projects to which policy loans and other types of subsidies were granted by central and local governments.

Therefore, it would not be difficult to establish that many of China's high-tech subsidies discussed above are *de jure* specific. The relevant national policy documents, such as the Five-Year plans and the MIC 2025, and their implementing regulatory instruments at both national and local levels, explicitly set out the priority sectors and projects and the development goals, and direct the provision of a variety of financial contributions to these sectors. For instance, these policies have led to the creation and continuous expansion of the government investment funds to which only enterprises in the selected sectors (e.g. semiconductors, NEVs) are eligible. Likewise, the preferential tax treatment for HNTEs and for R&D activities in general, as discussed in Section III.A(ii) above, is also specific. While eligibility for the preferential treatment is assessed based on certain criteria and conditions, one of the criteria explicitly requires an applicant to undertake R&D in one of the priority high-tech sectors. Where such preferential treatment is applied at local levels, it may be regionally specific, as discussed below.

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289 See above n 159, Appellate Body Report, *US – Anti-Dumping and Countervailing Duties (China)*, para. 368.
290 Ibid., para. 367.
291 Appellate Body Report, *United States – Countervailing Duty Measures on Certain Products from China* (hereinafter *US – Countervailing Measures (China)*), WT/DS437/AB/R (adopted 16 Jan. 2015), para. 4.129.
292 Ibid., para. 4.141.
293 See above n 159, Appellate Body Report, *US – Anti-Dumping and Countervailing Duties (China)*, paras. 370-371.
294 Ibid., para. 373.
295 See above n 178, Appellate Body Report, *EC – Aircraft*, para. 949.
296 See above n 159, Appellate Body Report, *US – Anti-Dumping and Countervailing Duties (China)*, paras. 386-400.

Regional specificity concerns the eligibility for a subsidy being limited to "certain enterprises" in a designated geographical region. WTO panels have ruled that this type of specificity merely requires that a subsidy is limited to a designated region without the need to establish further that it is also limited to a subset of enterprises within the region.[297] In other words, even if the subsidy is available to all enterprises in the region, the fact that it is limited to the region is sufficient to show specificity. In contrast, a subsidy granted by a local government to enterprises throughout its jurisdiction, i.e. not limited to a specific segment of the local jurisdiction, would not be regionally specific.[298] Thus, to the extent that China's high-tech subsidies are provided by a local government to enterprises in the selected sectors in its entire jurisdiction, such subsidies would be enterprise/industry-specific, not regionally specific.[299]

Complexities may arise where the designated area is a segment of a local jurisdiction. In *US – Anti-dumping and Countervailing Duties (China)*, the panel considered the provision of land-use rights to certain enterprises in an Industrial Park within the jurisdiction of a local government in China (i.e. the Huantai County). It ruled that a designated geographical region may encompass "any identified tract of land within the jurisdiction of a granting authority" and hence the Industrial Park.[300] However, the panel observed that the subsidy is not specific just because the land was physically located in the designated area. Further evidence was required to show that the land-use rights in the area constituted a "distinct regime" for the provision of that financial contribution compared with the general provision of land-use rights by the local government in its jurisdiction. In this regard, the panel suggested that the subsidy may not be regionally specific if "all purchasers of land-use rights throughout the jurisdiction of the granting authority paid exactly the same below-market price for land".[301] As shown above, industrial parks, high-tech zones and the like are widespread in local jurisdictions in China. According to the current case law, the facts that they constitute designated areas, and that subsidies are provided to these areas, are insufficient to prove regional specificity. A further step must be taken to show that a subsidy program provided to such a segment of a jurisdiction is distinct. In practical terms, this program would be distinct if it is only available to the designated area or offers preferential terms and conditions compared to those provided to enterprises outside the area. This further step would not be a hurdle to establishing that China's high-tech subsidies are regionally specific. For example, as discussed in Section III.A(iii), the provision of land-use rights and energy inputs to designated areas such as high-tech zones by local governments has been generally based on preferential rates compared to the standard rates applicable in the relevant jurisdictions. This has to do with the fact that these areas are created to fulfill the policy objectives and mandates envisaged by the central government, and more specifically to promote the growth of the priority sectors within the jurisdictions according

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297 See eg. above n 109, WTO Panel Report, *EC – Aircraft*, para. 7.1223; WTO Panel Report, *United States – Definitive Anti-Dumping and Countervailing Duties on Certain Products from China* (hereinafter *US – Anti-Dumping and Countervailing Duties (China)*), WT/DS379/R (adopted 25 Mar. 2011), para. 9.135. For a discussion of this approach, see above n 96, Muller, *WTO Agreement on Subsidies and Countervailing Measures: A Commentary*, at 194-195.

298 See above n 291, Appellate Body Report, *US – Countervailing Measures (China)*, para. 4.165.

299 However, a subsidy provided by the central government to certain regions would be regionally specific. Ibid., para. 4.165.

300 See above n 297, WTO Panel Report, *US – Anti-Dumping and Countervailing Duties (China)*, paras. 9.140-9.144, 9.156.

301 Ibid., paras. 9.158-160. This finding was appealed; however, the Appellate Body did not consider the substance of this ruling, that is, the requirement of consideration of whether a subsidy granted to a specific area constituted a distinct regime.

to local strengths and advantages. Thus, these subsidies constitute a distinct regime and are regionally specific.

Where there is no written instrument, difficulties may arise in establishing *de facto* specificity. The case law requires the demonstration of "a systematic series of actions" pointing to "the existence of an unwritten 'subsidy programme'".[302] Recall that the *US – Countervailing Measures (China)* dispute involved the provision of production inputs such as HRS by Chinese SOEs to downstream industries for less than adequate remuneration. Due to the lack of any written instrument creating such a subsidy program, the US authority found these alleged subsidies to be *de facto* specific in a range of countervailing investigations. While these findings were endorsed by the panel in the original proceedings, the Appellate Body rejected the panel's ruling that the consistent provision of the relevant input by the SOEs was sufficient to show the existence of "a systematic series of actions".[303] However, the Appellate Body was unable to complete the analysis for lack of factual findings, leaving the issue of *de facto* specificity unresolved.[304] In the compliance proceedings, the Appellate Body, in upholding the findings of the compliance panel, elaborated that *de facto* specificity cannot be established merely based on "repeated transactions" but requires an assessment of how such transactions have constituted "a systematic subsidy programme".[305] In its findings of *de facto* specificity, the US authority merely requested information on the industry providing the relevant input and the number of recipients for three and four years respectively, without explaining how such information substantiated the existence of an unwritten subsidy programme.[306] Only during the compliance proceedings had the US adduced additional evidence relating to various Chinese policy mandates leading to the provision of the relevant input for nearly 50 years. Both the compliance panel and the Appellate Body regarded the additional evidence as "an *ex post* rationale" and refused to accept it. In any event, the Appellate Body stressed that the existence of such policy mandates, in itself, would not suffice and "a reasoned and adequate explanation" must be provided to show the existence of "a systematic subsidy programme".[307]

Thus, compared with *de jure* specificity, the showing of *de facto* specificity requires a higher evidentiary standard and level of analysis. This would make it more difficult for investigating authorities to tackle hidden or unwritten subsidies through countervailing measures. Although this difficulty applies to all WTO Members, China's longstanding practice of using SOEs to supply input at low costs to selected sectors[308] and entrenched commitment and ambitions to promote

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302 See above n 291, Appellate Body Report, *US – Countervailing Measures (China)*, para. 4.141; above n 223, Appellate Body Report, *US – Countervailing Measures (Article 21.5 – China)*, para. 5.233.

303 See above n 291, Appellate Body Report, *US – Countervailing Measures (China)*, paras. 4.148-4.151.

304 Ibid., paras. 4.152-4.157.

305 See above n 223, Appellate Body Report, *US – Countervailing Measures (Article 21.5 – China)*,, paras. 5.231-5.233. In the view of the Appellate Body, this latter requirement serves to avoid "that mere repeat action of upstream producers providing inputs to downstream recipients invariably leads to a finding of *de facto* specificity, which would circumvent the legal disciplines of Article 2.1(c)."

306 Ibid., para. 5.237.

307 Ibid., paras. 5.219, 5.240.

308 For instance, Chinese SOEs have provided stable supply of alumina, a key input to electronics products, at below-market or even below-cost prices to local companies. See above n 184, OECD Aluminum Report, at 93. Chinese steel SOEs also have received government subsidies over the years, which have enabled them to supply low-priced steel products to downstream industries, such as high-end equipment manufacturing. See Yibo Zhao, 'Profits-Losing BaoSteel Received RMB 1.7 Billion Government Subsidies and Analysis Points Out the Lack of Chance in Stop Losing on Its Own', Sina Finance (30 Dec. 2015), available at: http://finance.sina.com.cn/chanjing/gsnews/2015-12-30/doc-ifxmxxst0778361.shtml.

the high-tech industry have understandably generated considerable concerns. However, one may argue that at the end of *US – Countervailing Measures (China)*, the Appellate Body was no longer concerned about the sufficiency of evidence after the US had provided the additional information in the compliance proceedings. Such information was not accepted by the WTO tribunals simply because it did not form the basis of US findings of *de facto* specificity in its countervailing investigations. In contrast, the remaining concern of the Appellate Body seems to be the lack of "a reasoned and adequate *explanation*" that links the various policy documents to the existence of an unwritten subsidy program. Admittedly, more guidance would be needed to fully understand the degree of explanation required. As far as China's high-tech sector is concerned, however, it would not be unreasonably difficult to offer such an explanation given the existence of the wide range of policy documents that explicitly direct all governments to support the selected high-tech sectors through all means, the dominant role of SOEs in the critical upstream industries (such as steel, aluminium, energy, raw materials and rare earths), and the fact that these SOEs have long benefited from government subsidies and other preferential regulatory treatment to be financially capable of supplying lower-priced input for production.[309] In reality, authorities may well utilize the ambiguities and hence flexibilities left in the *US – Countervailing Measures (China)* decision to treat the provision of production input by Chinese SOEs for less than adequate remuneration as being specific. Such practice has been widely adopted in numerous countervailing investigations against China. More often than not, authorities have also resorted to concurrent anti-dumping actions to address the market distortion and adverse impact caused by Chinese subsidies on domestic industries.

In addition, one may argue that the source of the distortions lies in the subsidies and preferential treatment provided to SOEs, enabling them to supply production input for less than adequate remuneration. Therefore, one way to deal with the subsidies to downstream industries would be to address the source of the problem, that is, to push China to reduce or remove the subsidies to SOEs. In this regard, Section 10.2 of China's Accession Protocol allows WTO Members to deem Chinese subsidies to SOEs as being "specific" if the SOEs "are the predominant recipients of such subsidies or … receive disproportionately large amounts of such subsidies." Given the dominant role of SOEs in the upstream industries mentioned above and the large amount of subsidies they receive, this WTO-plus commitment would mean that any subsidies provided to SOEs in these sectors would be "specific".[310] More broadly, as discussed in Section III.A(iii), paragraph 46 of the Working Party Report requires Chinese SOEs and SIEs to make purchases and sales solely based on commercial considerations. It may be argued that the longstanding and consistent practice of Chinese SOEs and SIEs selling input to selected downstream industries for less than adequate remuneration has precluded them from making reasonable returns that would generally be expected in commercial transactions. This obligation, therefore, provides an extra tool to address the problem concerned without the need to resort to the ASCM, thereby avoiding the potential difficulties in establishing *de facto* specificity.

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309 See eg. above n 184, OECD Aluminum Report; Morrison and Tang, 'China's Rare Earth Industry and Export Regime: Economic and Trade Implications for the United States', at 13-14; Julia Ya Qin, 'WTO Regulation of Subsidies to State-Owned Enterprises (SOEs) – A Critical Appraisal of the China Accession Protocol', (2004)7(4) *Journal of International Economic Law* 863, 875-882.

310 For further discussions of this commitment, see above n 309, Qin, 'WTO Regulation of Subsidies to State-Owned Enterprises (SOEs) – A Critical Appraisal of the China Accession Protocol', at 890-891.

F. Concluding Remarks

In summary, the ASCM does not cover all kinds of government actions, especially those which may be regarded as indirect subsidization. This limited coverage may well reflect the politically desirable balance between the disciplining of subsidies and the protection of regulatory space. However, the scope of "financial contributions" is apparently broad enough to capture the major subsidies in China's high-tech sector. Government measures, such as export restraints, VAT rebates, regulatory preferences or incentives, that seem to fall outside the reach of the ASCM are used widely in the high-tech and other industries across many jurisdictions and may cause market distortions detrimental to trading partners.[311] Other existing WTO rules including China's WTO-plus obligations may and should be employed to tackle these measures and distortions more directly. Likewise, contrary to the dominant view that the existing WTO rules are inadequate to tackle Chinese subsidies, the other major legal conditions (i.e. public body, entrusted or directed private body, benefits conferred and specificity) which must be satisfied for a financial contribution to be actionable or countervailable are not so difficult to establish either. Where difficulties may arise in establishing some of these conditions, such difficulties generally apply to all WTO Members. If anything, China's WTO-plus obligations have provided important additional discipline on Chinese subsidies and market-distortive behaviour and conduct more broadly, leaving significantly less policy space for China. Since these extra rules have been strikingly under-utilized to date, the claim that the current rules are inadequate is unpersuasive and misleading. Finally, where new and better rules may be needed, they can only be created by WTO Members through negotiations, not by WTO tribunals through adjudication.

IV. THE FUTURE OF INTERNATIONAL REGULATION OF SUBSIDIES

As an essential policy tool, industrial subsidies had been on the rise before the pandemic and have become even more crucial as governments around the globe pursue economic recovery.[312] There is, therefore, a growing and imminent need for governments to find a way to address the detrimental effects of subsidies on trade and avoid tit-for-tat subsidization. There are at least three options. One is for each government to unilaterally reduce or remove the pandemic-induced subsidies as they become dispensable. This option, however, will unlikely affect subsidies less related to the pandemic such as those in high-tech industries. The second option would be for governments to challenge these subsidies at the WTO. While this option may cover all industrial subsidies regardless of whether they are pandemic-related, it may not be effective in the absence of a functioning Appellate Body as losing parties may simply 'appeal into the void',[313] which would

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311 See generally above n 125, OECD Semiconductor Report 2019; above n 184, OECD Aluminum Report 2019; above n 234, OECD, 'State-Owned Enterprises as Global Competitors: A Challenge or an Opportunity?', at 27-30.

312 See eg. Dessie Ambaw et al., 'Lessons from the Pandemic for Future WTO Subsidy Rules' in Simon Evenett and Richard Baldwin (eds) *Revitalising Multilateralism: Pragmatic Ideas for the New WTO Director-General* (London: CEPR Press, 2020) 203-211, 203-208; Lisa McGuirk et al., 'The Use of Industrial Subsidies by Major Economies: Economic and Legal Perspectives', Report of the National Board of Trade Sweden (2020) 1, 10-14, available at: www.kommerskollegium.se/en/publications/reports/2020/the-use-of-industrial-subsidies-by-major-economies/.

313 See generally Joost Pauwelyn, 'WTO Dispute Settlement Post 2019: What to Expect?', (2019)22(3) *Journal of International Economic Law* 297.

gradually disincentivize governments from resorting to the dispute settlement mechanism. There is, therefore, an urgency for WTO Members to revive the Appellate Body. In the case of China, the dispute settlement mechanism has proven effective in enforcing compliance and influencing domestic policymaking and has prompted gradual and systematic adjustments of China's complex regulatory regime.[314] It will become increasingly difficult to do so, such as by using the system to push China to reduce or remove trade-distortive high-tech subsidies, if the other major players continue to abuse the right of appeal to avoid binding decisions and implementation.[315] The third option is negotiation which may start among major economies to lay the groundwork for more inclusive negotiations at the multilateral level. To do so, governments will need to leverage the impacts of the pandemic and the global (ab)use of subsidies to generate sufficient political will. Despite the difficulties in such negotiations and the time they may take, this is the only way to address any perceived deficiencies in the current subsidy rules. The rest of this section, thus, seeks to develop some general principles and approaches for future negotiations of industrial subsidies after a brief discussion of the major proposals in the literature.

Existing proposals for the reform of WTO subsidy rules largely reflect the competing interests between strengthening the current rules and preserving policy space. One major proposal calling for more onerous discipline is the latest US-EU-Japan joint statement released on 14 January 2020.[316] Amongst others, the joint statement proposes to expand the list of prohibited subsidies, specify the circumstances in which external benchmarks may be used for the determination of "benefit conferred", and reverse the Appellate Body's "authority/function-based" approach to "public body". We have discussed why the current laws on the use of external benchmarks and the determination of "public body" are not inadequate to address Chinese subsidies in the high-tech sector in Section III. This discussion is applicable to subsidies in other Chinese industries. As regards the proposed prohibited subsidies, the joint statement is concerned about only a few selected types of subsidies: unlimited guarantees, subsidies aiming to rescue an insolvent enterprise or to finance an enterprise in sectors or industries in overcapacity, and certain direct forgiveness of debt. The fundamental problem in this proposal is the lack of any rationale for the treatment of the selected subsidies more strictly than other subsidies. This problem has to do with the fact that the joint statement targets China and hence some of the Chinese subsidies that have attracted considerable criticisms. As such, this proposal has ignored many other equally or even more controversial subsidies in the economies of other WTO Members including the parties to the joint

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314 See generally above n 167, Zhou, *China's Implementation of the Rulings of the World Trade Organization*.

315 For example, the US, in two recent cases, 'appealed into the void' a panel ruling against the trade war tariffs it imposed on China and another panel ruling against its anti-subsidy tariffs on softwood lumber originated in Canada, both of which were found in breach of WTO rule. See U.S. Mission to International Organizations in Geneva, Statements by the United States at the October 26, 2020, DSB Meeting (26 Oct. 2020) at 12, available at: https://geneva.usmission.gov/2020/10/26/statements-by-the-united-states-at-the-october-26-2020-dsb-meeting/; WTO, *United States – Countervailing Measures on Softwood Lumber from Canada*, Notification of An Appeal by the United States under Article 16 of the Understanding on Rules and Procedures Governing the Settlement of Disputes, WT/DS533/5 (29 Sep. 2020). The EU recently appealed the panel's findings against its anti-dumping actions against Russia. See WTO, *European Union – Cost Adjustment Methodologies and Certain Anti-Dumping Measures on Imports from Russia (Second Complaint)*, Notification of An Appeal by the European Union under Article 16.4 and Article 17.1 of the Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU), and under Rule 20(1) of the Working Procedures for Appellate Review, WT/DS494/7 (1 Sep. 2020).

316 See above n 15, 2020 Joint Statement. For a more detailed discussion of the joint statement, see generally Robert Howse, 'Making the WTO (Not So) Great Again: The Case Against Responding to the Trump Trade Agenda Through Reform of WTO Rules on Subsidies and State Enterprises', (2020)23(2) *Journal of International Economic Law* 371.

statement. Another major problem of this proposal is the lack of consideration of the policy space needed for governments to use the named subsidies for legitimate regulatory goals. Accordingly, the joint statement is flawed, biased and infeasible. Future negotiations will need to address subsidies in the economies of all negotiating parties in ways that strike a balance between further regulation of subsidies and protection of legitimate use of subsidies.

Indeed, proposals of developing countries in the Doha round have gone in the opposite direction calling for more policy space by reintroducing non-actionable subsidies, as mentioned in Section III.[317] More recently, China's proposal on WTO reforms also sought to reinstate and expand the coverage of non-actionable subsidies as a way to curb the abuse of countervailing measures.[318] In line with these proposals, leading commentators have put forward recommendations for developing an improved mechanism to provide sufficient room for the application of subsidies for environmental,[319] R&D,[320] and other legitimate goals, particularly those envisaged under the pre-existing non-actionable scheme.[321] These proposals speak strongly to the importance of maintaining flexibility for the use of subsidies in pursuit of legitimate regulatory goals and the need to broaden the scope of permitted subsidies.[322]

Drawing on our discussions throughout the paper so far, we put forward three general principles for future negotiations of subsidy rules. First, the negotiations must not be disproportionately focused on China and instead must focus on addressing trade-distortive subsidies in all economies involved. Given the widespread use of industrial subsidies, a China-focus would be perceived by China as discriminatory treatment, thereby adding unnecessary complexities to the already difficult negotiations and undermining the chances of reaching a positive outcome.

Second, the negotiations need to strike a balance between tightening the regulation of subsidies and maintaining the flexibility to use subsidies for legitimate policy objectives. As mentioned in Section III and argued in detail elsewhere, the Theory of Distortions and Welfare provides well-established economic guidance for how to achieve this balance.[323] In essence, the theory establishes that for trade liberalization to remain welfare-enhancing, trade rules must allow governments the freedom to address their own domestic externalities or non-protectionist policy goals. However, the theory suggests that the policy instruments that governments employ to achieve a chosen goal would need to be regulated. In this regard, the theory ranks different policy instruments according to their economic efficiency and develops the Targeting Rule whereby the efficiency of an

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317 See above n 95.

318 See WTO, General Council, China's Proposal on WTO Reform, WT/GC/W/773 (13 May 2019) at 5.

319 See generally Steve Charnovitz, 'Green Subsidies and the WTO', World Bank Policy Research Working Paper 7060 (Oct. 2014), available at: https://openknowledge.worldbank.org/handle/10986/20500.

320 See generally above n 82, Maskus, 'Research and Development Subsidies: A Need for WTO Disciplines?'; Matthew Kennedy, 'The Adverse Effects of Technological Innovation under WTO Subsidy Rules', (2020)19(4) *World Trade Review* 511 (showing how subsidies for technological innovation may be subject to more challenges under the current rules).

321 See generally above n 82, Rubini, 'Rethinking International Subsidies Disciplines: Rationale and Possible Avenues for Reform'.

322 But see Gary Horlick and Peggy A. Clarke, 'Rethinking Subsidy Disciplines for the Future', E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2016 (proposing that non-actionable subsidies must be narrowly defined and subject to clear boundaries).

323 See above n 81. For a discussion of this theory and its applications to resolving trade disputes and facilitating trade negotiations particularly involving trade and non-trade values, see respectively above n 84, Zhou, 'In Defence of the WTO: Why Do We Need A Multilateral Trading System'; Weihuan Zhou and Henry Gao, 'US-China Trade War: A Way Out?', (2020)19(4) *World Trade Review* 605.

instrument enhances as it tackles the chosen objective more closely. This general rule is subject to the by-product costs associated with the use of an optimal instrument. For instance, while direct subsidization tends to be an optimal means to address domestic externalities on many occasions, it may become sub-optimal as the costs of disbursement may outweigh the efficiency gains generated by the use of subsidies as opposed to other means.[324] These propositions suggest that one way to distinguish "good" and "bad" subsidies, from an economic perspective, would be to inquiry into whether a chosen subsidy targets a given objective directly at the source and if not, why a sub-optimal subsidy is adopted, taking into account the effectiveness of the subsidies in pursuing the objective and their by-product costs. For example, if the externality concerns the lack of consumption of certain goods or an objective to stimulate that consumption, then a subsidy to consumers would be generally more efficient than other types of subsidies. Where the externality concerns an inefficient capital market or an objective to promote finance for R&D, then a direct subsidization (eg. in the form of tax incentives) in the capital market would be preferable. Overall, the significance of the theory lies in the distinction between policy objectives and policy instruments and the emphasis on regulating the latter while leaving room for consideration of the effectiveness and reasonable availability of less efficient means. In doing so, the theory also offers a way to discipline protectionist use of subsidies without unduly impairing the capacity of governments to use subsidies for legitimate goals.[325]

Third, while the negotiations should generally follow the economic guidance above, they need to pursue an outcome that is politically achievable. In subsidy negotiations, as shown in Section III, governments may be more concerned about the impacts of a foreign subsidy on their domestic industries than the welfare effects of the subsidy. Recently, two major proposals have stressed the need to target subsidies with negative spillover effects from a global perspective.[326] To do so, however, governments will need to be provided with sufficient data and other information to assess the actual or potential global welfare effects of numerous types of subsidies. And even if such data is made available, governments would be likely to remain more concerned about the impacts of subsidies on domestic industries than their global welfare effects. In addition, just like negotiations in other areas of trade, future subsidy negotiations will necessarily leave some trade-distortive subsidies un-addressed or under-addressed for political reasons. Taken together, the above means that reforms of subsidy rules will be affected by political considerations (although it is advisable for negotiators to follow the economic guidance and data) and will only progress incrementally.

In light of the principles above, we propose the following general approaches to future negotiations of industrial subsidies. Governments should be allowed to choose their own policy objectives but should be asked to provide information about the objective(s) behind an existing

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[324] See Max W. Corden, *Trade Policy and Economic Welfare* (Oxford: Clarendon Press, 2d ed., 1997) 33-44. Corden concluded that whether the disbursement costs may render direct subsidization sub-optimal requires robust empirical evidence. This is not further considered in this paper.

[325] For a detailed discussion on this point, see above n 84, Zhou, 'In Defence of the WTO: Why Do We Need A Multilateral Trading System'.

[326] See Peter Draper et al., 'Industrial Subsidies As A Major Policy Response Since the Global Financial Crises: Consequences and Remedies', Task Force 1 Trade, Investment and Growth, T20 Policy Brief (14 Sep. 2020) [hereinafter 'T20 Proposal'], at 9-10, available at: https://t20saudiarabia.org.sa/en/briefs/Pages/Policy-Brief.aspx?pb=TF1_PB3; Bernard Hoekman and Douglas Nelson, 'Subsidies, Spillovers and Multilateral Cooperation', EUI Working Papers RSCAS 2020/12 (2020) at 13-15, available at: https://cadmus.eui.eu/handle/1814/66209.

or potential subsidy. In this regard, Article 25.3(iii) of the ASCM already requires WTO Members to do so in their notifications of subsidies, which could be used as a basis for the negotiations. The identification of policy objectives is necessary for a discussion about whether a subsidy is the optimal means to pursue a given objective and if not, whether it is because an optimal subsidy is not reasonably available so that a different type of subsidy is needed. This discussion will also involve consideration of the impact of a subsidy on trading partners, its global welfare effects and political implications for both subsidizing and affected foreign countries. Through this approach, the outcome of negotiations would reflect a balance which allows room for governments to use economically preferable and politically feasible subsidies for any preferred objectives while at the same time reducing the impacts of these subsidies on trading partners.

To enhance the achievability of a political compromise, it is necessary for the negotiations to deviate from the conventional approach to the regulation of industrial subsidies whereby all governments are subject to the same set of rules on, *inter alia*, prohibited and non-actionable subsidies, the conditions for the use of non-actionable subsidies including the magnitude of such subsidies. Instead, the negotiations must recognize that each country has different regulatory priorities/needs and different economic, political, social and other situations and constraints in terms of the use of subsidies, the level of support, etc. especially in the post-pandemic era. While the conventional approach may still be used to set out rules that are generally applicable, it must be supplemented by an approach that allows country-specific commitments and exceptions. For this purpose, the negotiations should adopt a scheduling approach to produce an Industrial Subsidy Schedule for each country. This approach is nothing new to the WTO and has already been adopted in negotiations of tariff concessions and commitments in trade in services, although it may be more complex for subsidy negotiations. An Industrial Subsidy Schedule should set out the sectors that may require subsidization, the objective(s) that a subsidy serves, the magnitude of subsidies (which may include an upper limit and/or a phase-down or phase-out period), and any foreseeable circumstances in which similar or new subsidies may need to be re-introduced or the magnitude may need to be increased. To give effect to the schedule, a provision will need to be added to the ASCM to require governments not to grant subsidies that go beyond their scheduled commitments. A provision on renegotiation of the commitments or modification of schedules would also be desirable.

In addition, governments should have the right to use subsidies for legitimate policy objectives that are commonly accepted. This requires an additional provision in the ASCM to explicitly allow recourse to the general exceptions and security exceptions set out in GATT Articles XX and XXI.[327] This provision may simply reproduce Article 3 of the Agreement on Trade-Related Investment Measures which states: "All exceptions under GATT 1994 shall apply, as appropriate, to the provisions of this Agreement." This addition is important and necessary as it would ensure that the exceptions are consistently applied to different kinds of policy instruments and would incentivize governments to use subsidies, as opposed to less efficient and more trade-restrictive means (such as quantitative restrictions and tariffs), for these regulatory goals.

[327] See above n 319, Charnovitz, 'Green Subsidies and the WTO', at 18 (noting that Article XX does not apply to the ASCM as per the mainstream view); above n 316, Howse, 'Making the WTO (Not So) Great Again: The Case Against Responding to the Trump Trade Agenda Through Reform of WTO Rules on Subsidies and State Enterprises', at 374 (observing that a breach of the ASCM cannot be justified by the legitimate goals contemplated in Article XX).

Finally, it is worth noting that our proposals are not intended to cover all aspects of future negotiations on industrial subsidies. For example, there is a need for institutional settings of the negotiations at a sub-multilateral level,[328] and for an improvement of subsidy notifications and transparency. Our purpose is to contribute to the ongoing discussions of how best to re-invigorate and facilitate international cooperation on the regulation of industrial subsidies.

V. CONCLUSION

For decades, the multilateral trading system has played a critical role in promoting international cooperation on trade policymaking and dispute resolution, making significant contributions to maintaining peace and prosperity for the international community. Amongst other factors, China's rise has caused growing concerns about whether the system is effective and should remain relevant. These concerns have led to dramatic trade policy changes in the US, taking unilateral actions against China and strangulating multilateral cooperation while in the meantime calling for reforms of the WTO. While the outbreak of COVID-19 has intensified the crisis in the multilateral trading system, none of these China-related concerns are caused by the pandemic and will not subside with it.

China's economic growth has relied heavily on industrial policies and subsidies which have been increasingly applied to foster China's technological capability, indigenous innovation and global competitiveness. US unilateral actions have proven to be futile and will remain so if the purpose is to fundamentally change China's economic model or curb its technological advancement. Like all other countries, China should and has every right to upgrade its economic growth model and promote innovation and digital transformation. Whether China has done so in ways that violate its international obligations must be assessed by WTO tribunals based on evidence and detailed legal examination rather than by unsubstantiated allegations. Likewise, whether new rules may be needed to deal with China requires a careful assessment of the existing rules and jurisprudence, and eventually must be determined by all WTO Members via negotiations. Both the negotiation of new rules and the adjudication of trade disputes require a functional system for international cooperation which China has consistently advocated for.[329] Therefore, it is only reasonable to anticipate that it is through the multilateral approach, rather than unilateral actions, that one may effectively address so-called 'China issues', including industrial policies and subsidies. Fortunately, there seem to be some positive signs of moves in that direction under the Biden Administration.[330]

Although China's industrial policies and subsidies have been at the core of the US's concerns and global trade policy debate, such policies are widely used by all economies for a variety of domestic regulatory goals. Both the application of the current WTO rules on subsidies and the development

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328 See eg. above n 326, Draper et al., 'Industrial Subsidies As A Major Policy Response Since the Global Financial Crises: Consequences and Remedies' (proposals for negotiations of industrial subsidies among G20 members).

329 See eg. 《中国与世界贸易组织》白皮书 [White Paper on China and the World Trade Organization], published by the Information Office of the State Council on 28 June 2018, available at www.scio.gov.cn/zfbps/32832/Document/1632334/1632334.htm; WTO, 'Joint Statement by the European Union, China, Canada, Norway, New Zealand, Switzerland, Australia, Republic of Korea, Iceland, Singapore, Mexico, Costa Rica and Montenegro', WT/GC/197 (14 Dec. 2018).

330 See eg. William Mauldin, 'GOP Report, Like Biden, Urges Multilateral Approach to China', The Wall Street Journal (18 Nov. 2020), available at: www.wsj.com/articles/gop-report-like-biden-urges-multilateral-approach-to-china-11605703493.

of new rules in the future must strike a balance between regulation of trade-distortive subsidies and protection of policy space for the legitimate use of subsidies. In this regard, one must note that China's WTO obligations have extended significantly beyond the general WTO rules and have the potential to constrain Chinese industrial subsidies and government intervention in the economy more broadly. The efficacy of most of these China-specific rules has remained untested to date. Yet, the view that the current rules are inadequate to tackle Chinese subsidies has (unjustifiably) dominated the international trade community.

Using China's subsidization in the high-tech sector as an illustration, we have challenged this dominant view by showing that even the general WTO rules on subsidies do not create any substantive hurdles to tackling the major types of Chinese technology subsidies. Where difficulties may arise in a few circumstances, these are not specific to China but generally apply to all WTO Members. In addition, the China-specific rules have been drafted in a broad manner so as to provide not only flexibilities to overcome these difficulties but also extra tools to constrain other modes of state intervention that may adversely affect the interests of China's trading partners. Given China's good record of complying with the rulings of WTO tribunals, one should be optimistic about using the dispute settlement system to push China to reduce or remove subsidies and other WTO-illegal laws and practices. This, however, will be difficult to achieve in the absence of a functional Appellate Body. Although we have focused on technology subsidies in this paper, our discussions and observations may be applied to other industrial policies and subsidies in China.

Faced with the widespread and increasing use of industrial subsidies triggered by the pandemic, policymakers, scholars and other stakeholders have been developing mechanisms for international cooperation. To contribute to this discussion, we put forward some general principles and approaches for future negotiations of industrial subsidies emphasizing the need to target trade-distortive subsidies rather than China, to balance between strengthening subsidy rules and preserving policy space, to follow economic guidance and data while accommodating political considerations, and most innovatively, to shift from the 'one-size-fits-all' approach to a country-specific approach through a scheduling method whereby an Industrial Subsidy Schedule is created to record policy objectives, commitments and exceptions of each nation. Our recommendations are not intended to be exhaustive but to develop ideas that may facilitate international cooperation on industrial subsidies in the post-pandemic era.