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ROBOTS, THE INTERNET OF THINGS AND THE FUTURE OF TRADE

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Abstract

Will robots and the Internet of Things falter at national borders?

If the Internet of Things offers eyes and ears and robots add arms and legs, both these revolutionary technologies often depend on brains and memories located far away. This is the nature of the remote sensor/server architecture utilized by both the Internet of Things and cloud robotics. Thus, both the Internet of Things and robots rely on the free flow of information across national borders. But this global free flow of data is increasingly at risk to claims that such flows jeopardize privacy and security. Increasingly, national laws restrict the transfer of information outside the home country. A Dropcam, a Fitbit, a Nest thermometer and even a Google car all depend on the flow of data to the home country of their creators. The Internet of Things and cloud robotics may thus find themselves foiled by national borders, victim to a new privacy-based non-tariff barrier to trade.

Can international trade law, which after all seeks to liberalize trade in both goods and services, help stave off attempts to erect border barriers to this new type of trade? The smart objects of the 21st century consist of both goods and information services, and thus are subject to multiple means of government protectionism, but also trade liberalization. This paper is the first effort to locate and analyze the Internet of Things and modern robotics within the international trade framework.

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Fast forward a decade and imagine your morning routine.

You wake up gently at a time carefully selected by a bracelet monitoring your sleep patterns after drawing on weeks of data stored on a server that lives somewhere in the American west. You trudge to the bathroom and step on to the scales, which quickly shoots your weight to that same server and helps determine just how long and how strenuous your next session on the treadmill will be. … Later, your toothbrush sends updates to a dental service and, spotting the early signs of a cavity, books an appointment.

Welcome to the "internet of things", [which is]… now perplexing trade negotiators and experts on digital trade.

Were you to live in Europe those sleep records stored on a US server could easily violate data localisation and privacy laws. The same applies to the incriminating information shared by your bathroom scales.

Your fridge and coffee pot might well be communicating via a server in South Korea or China, which in turn is liaising with a Google server in Ireland to check on your calendar. The first six months of your dental service came free with the Chinese-made toothbrush you bought at a local chemist but renewing it means paying your fees to the service in Germany that relays your data to a virtual clinic staffed by experts in Bangalore, who send your particulars to the local dentist.[1]

Science fiction does not often grace the pages of the *Financial Times*. But the thought experiment draws attention to an emerging reality—the burgeoning digital ephemera of our lives that are now flowing across the world. The sensors embedded in household robots and in the Internet of Things transmit information across the world to be recorded and analyzed. It should come as no surprise then that alarms are being sounded about the privacy implications of devices that both sense and communicate. The dream of a new era of smart objects that improve our lives stands imperiled by claims that personal information cannot be trusted to foreigners. The rise of cloud robotics and the Internet of Things stands at risk of falling victim to a new type of non-tariff barrier to trade, *privacy as trade barrier*.[2]

The thought experiment also demonstrates that the stuff that flows across borders no longer arrives on container ships alone. The traditional dyad of

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[1] Shawn Donnan, *Digital Trade: Data Protectionism*, FINANCIAL TIMES, Aug. 5, 2014.

[2] Elsewhere Uyen Le and I describe current efforts across the world to prevent data from being exported outside a country. Anupam Chander & Uyen P. Le, *Data Nationalism*, 63 EMORY L. J. 639 (2015).

international trade—goods versus services—is being rendered obsolete. With the rise of robotics and the Internet of Things, goods increasingly incorporate services, confounding the standard dichotomy.

The Internet of Things is characterized by objects with sensors to understand features of their environment and an ability to communicate. Those that are classified as robots also have the power to directly affect their environment. Where the Internet of Things has eyes and ears, robots add arms and legs. Both robots and the Internet of Things often depend on brains and memories located far away in large data centers that efficiently process and store information.[3] Robots increasingly depend on analytics made possible in large cloud computing infrastructure. In this way, both robots and the Internet of Things depend on crossborder flows of data, which become the lifeblood of these objects.

Scholars writing about the Internet of Things have focused on the radical implications for privacy and security of a world where the objects around us noiselessly gather and process data—call these Smart Objects. For the Smart Objects that are classified as robots, the scholarly focus has been on issues of liability. In either case, scholars have thus far confined themselves to the domestic regulatory implications of the age of intelligent objects. In this article, I wish to expand the lens to examine intelligent objects as part of the international legal order.

The doctrinal confusion that attends Smart Objects obscures a more fundamental problem: the coming of the Smart Objects increases opportunities for protectionism. Now, even if a good cannot be refused at the border *qua good* because of international trade commitments, it may still be rejected because of its embedded data flows. In particular, because smart devices raise serious concerns about privacy and security, countries might reject such objects because they may entail the transfer of information abroad.[4] The international trade in goods that flourished after war and that powered global growth may thus be at risk, a casualty of the increasing sophistication of the goods themselves. Concerns for privacy and security may lead to new barriers to the free flow of information across borders, but also to the flows of goods across borders.

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[3] The Google automated car depends, for example, on remote data processing. Alexis C. Madrigal, *The Trick That Makes Google's Self-Driving Cars Work*, ATLANTIC.COM, May 15 2014, http://www.theatlantic.com/technology/archive/2014/05/all-the-world-a-track-the-trick-that-makes-googles-self-driving-cars-work/370871/#disqus_thread.

[4] Countries might also reject goods for all sorts of other reasons, of course. Security based concerns include not only whether data is transmitted abroad, but whether the device itself is insecure. One study found that seventy percent of Internet of Things devices are insecure. HP, *HP Study Reveals 70 Percent of Internet of Things Devices Vulnerable to Attack*, http://www8.hp.com/us/en/hp-news/press-release.html?id=1744676 (July 29, 2014).

This is but another evolution in the ever shape-shifting nature of protectionism. As tariffs fell to trade liberalization obligations, nations turned to non-tariff barriers to keep out foreign goods,[5] modifying these in turn as earlier forms were brought under international trade disciplines. Jagdish Bhagwati colorfully labels this dynamic the "Law of Constant Protection"—"If you reduce one kind of protection, another variety simply pops up elsewhere."[6]

This transmutation of barriers from one form to another is not mere hypothetical. In August 2014, China banned its ministries and federal agencies from purchasing Apple iPads and MacBooks.[7] China represent Apple's second-largest market, after the US.[8] The exclusion came not because of the hardware, but apparently following a review of computer equipment for issues of security and privacy. Whatever the rationale, the decision had the effect of bolstering domestic competitors.[9] Indeed, shares in the Chinese computer maker Lenovo rose after the ban.[10]

Everyday brings another announcement of a new device that will connect with the Internet and intersect with our lives. Apple is expected to introduce a "Healthkit" with future devices, collecting and analyzing the user's health information. This will likely involve the storage and processing of data, potentially across national borders.[11] Cheaper and smaller computer chips and sensors, wider access to Internet, and vast improvements in battery technology—all mean that more and more commonplace objects will recognize aspects of the world around them and will process, communicate and store information remotely. Our interaction with international trade will be even more intense than it is now, with continuous streams of information flows passing, Matrix-like, invisibly around us.

This article, the first to consider the Internet of Things and robotics from an international trade perspective, begins by trying to define these hybrid artifacts

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[5] Edward John Ray, *Changing Patterns of Protectionism: The Fall in Tariffs and the Rise in Non-Tariff Barriers*, 8 NW. J. INT'L L. & BUS. 285 (1987).

[6] JAGDISH BHAGWATI, PROTECTIONISM 53-54 (1988).

[7] *China Said to Exclude Apple From Procurement List*, BLOOMBERG NEWS, Aug 6, 2014, http://www.bloomberg.com/news/2014-08-06/china-said-to-exclude-apple-from-procurement-list.html; Charles Clover, *China bans federal officials from buying Apple products*, FINANCIAL TIMES, Aug. 6, 2014.

[8] China accounted for 15.86% of global sales in the third quarter of Apple's 2014 fiscal year, and 20.35% in the previous quarter.

[9] China is not a party to the plurilateral Agreement on Government Procurement, so this action might not trigger WTO scrutiny because government procurement is exempted from the national treatment obligations in GATT and GATS. See GATT Art. III:8(a); GATS Art. XIII:1.

[10] Bloomberg, *supra* note 7.

[11] *Apple Prepares Healthkit Rollout Amid Tangled Regulatory Web*, N.Y. TIMES, Aug. 12, 2014, http://www.nytimes.com/reuters/2014/08/12/technology/12reuters-apple-healthcare-exclusive.html?hp&action=click&pgtype=Homepage&version=WireFeed&module=pocket-region&region=pocket-region&WT.nav=pocket-region.

and to situate them in existing trade law. Using a hypothetical *Australia—Fitness Trackers* dispute involving a Smart Object banned because of its foreign data flows, the article tries to understand contemporary trade law's likely response to a measure that might be seen as protecting consumer data on the one hand, or protectionist on the other. [TO COME: Finally, it sketches possible transnational and international law approaches to the era of Smart Objects.]

I. Ontology: Goods, Services, and Flows

Is a smart object a good or a service, or both? Or is it perhaps something else entirely? Classification matters because trade in goods is far more liberalized than trade in service.[12] Thus, those who favor protection would prefer to classify the object as a service. Those who favor trade liberalization would accordingly prefer to treat the object as a good. That is the standard view, following cases such as *Canada--Periodicals*. Yet, our analysis in Part II will reveal that there may be cases in which trade in a particular service is more liberalized than trade in goods.

International trade law has proved reticent in seeking to define a service with precision. The General Agreement on Trade in Services merely offers a recursive definition: "For the purposes of this Agreement, trade in services is defined as the supply of a service…."[13] For its part, the Dispute Resolution Body has not sought to define services abstractly, but rather simply identified a particular measure as one affecting services when faced with real world challenges that required a classification. Given technological changes that are creating new kinds of services or enabling for the first time international trade in existing kinds of services, such reluctance to ordain a strict definition seems prudent.

The classic WTO case deciding between a good and a service is *Canada—Periodicals*.[14] There the United States challenged a special Canadian tax on periodicals that adversely affected United States periodicals such as *Sports Illustrated*. The United States argued that the Canadian tax violated Canada's national treatment obligation for U.S. products under GATT. Canada countered that the tax was directed towards advertising in the magazines, and thus was a measure affecting a *service*, not a *good*. Since Canada had not promised national

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[12] Tani Fukui & Christine McDaniel, 4 J. INTL. COMMERCE & EC. 1 (Mar. 2012, web version Feb. 2010) ("a number of careful studies using different methodologies … have shown up to an order of magnitude of difference between barriers to services trade and barriers to goods trade"); Bernard Hoekman & Aaditya Mattoo, *Liberalizing Trade in Services: Lessons from Regional and WTO Negotiations*, Dec. 13, 2012, at http://globalgovernanceprogramme.eui.eu/wp-content/uploads/2012/11/Hoekman-Mattoo-Services-Cooperation_International_Negotiation_final.pdf ("[R]ecent World Bank research documents that barriers to trade in services in both high-income and developing countries remain high…").

[13] GATS Art. I:1.

[14] Appellate Body Report, *Canada–Periodicals*, WT/DS31/AB/R (Jun. 30, 1997).

treatment for advertising services under GATT, the Canadian characterization of the measure as one affecting a service would have defeated the U.S. challenge to the discriminatory tax. The Appellate Body rejected this argument, observing, "The entry into force of the GATS … does not diminish the scope of the application of the GATT 1994."[15] The Appellate Body found that the periodical in question definitely implicated services—but that the final product was a good which comprised services: "[A] periodical is a good comprised of two components: editorial content and advertising content. Both components can be viewed as having services attributes, but they combine to form a physical product -- the periodical itself."[16]

Applying *Canada—Periodicals* to our hypothetical *Australia—Fitness Trackers* dispute, should we not conclude that the fitness tracker is a good, which is comprised in part of services? Are not Smart Objects best understood as goods, the successor to computerized objects such as the Casio smartwatches of the early 1980s?[17] After all, the Casio Databank watch stored an address book and calendar, alongside calculator functions. It certainly held a computer chip.

But the smartwatches of today are far more Dick Tracy than the devices of the era that brought us Back to the Future. Today's smartwatches connect user information to the Internet, storing and accessing information held on Internet servers around the world. This is true generally of today's Smart Objects as well: the continuous, real-time, evolving information flows emanating from and to the Internet of Things and the robots of today distinguish them from most earlier computerized objects. While computers have long been embedded in devices, from Casio smartwatches to a Tickle-Me-Elmo, the new devices also continuously communicate with the world.

Even if they communicate with the world, does that necessarily involve a service? Perhaps we should consider the data flows as communications, not as services at all? While it is easy to see the "good" aspect of a Smart Object, it can be more difficult to recognize the services embedded within. Services now provided across borders include such abstract concept as thinking, analyzing, recommending, and remembering. In many cases, the data flows entailed by these products cannot be found in traditional tariff classification schemes.[18]

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[15] *Id.* at 19.

[16] *Id.* at 17.

[17] http://en.wikipedia.org/wiki/Calculator_watch.

[18] *Cf.* Fiona Smith & Lorna Woods, *A Distinction without a Difference: Exploring the Boundary between Goods and Services in the World Trade Organization and the European Union*, 12 COLUMBIA J. EURO.L. 463, 510 (2005/06) ("[N]ew products may not fit easily into the existing coding systems with disagreement arising over the correct classification of the product. There is a risk of discrepancies arising in two contexts: either products can be classified differently within the HS or W/120/CPC code, or, more radically, products can be classified as goods in one scheme and services in another. This problem is acute for

Some of the data flows are easy to recognize as services. Take for example the home monitoring service offered by makers of modern surveillance cameras. The Dropcam home surveillance system offers a $149 camera, the major feature of which—permitting the user to see who entered the premises after the fact--only works with a $9.95 per month video recording service.[19] That service consists in cloud recording and replaying of the surveillance video. Dropcam itself describes the recording option (which records events around your home and stores the recording in a cloud for easy access) as a "service."

In many cases, the economic value of the service will over the long term overwhelm the value of the good. Again, this is evident in smart objects such as a Dropcam, for which the monthly video recording service cost exceeds the cost of the camera in little more than a year's time.

But what of a Samsung home monitoring camera, which offers an option to send the video home surveillance recording to a private channel on YouTube? (This might well involve the flow of data from a house in California to a data server in South Korea and then back to Google's data servers in California or elsewhere on the West Coast.) And all of this for free. Perhaps the *sine qua non* of a service should be whether it is provided for a cost? Under such a rule, Wikipedia would not be a service under international trade, even though it largely replaced the expensive encyclopedias of earlier generations. For Smart Goods like the Samsung camera, it seems better to treat the service as bundled with the good itself at the point of sale. Indeed, one of the key selling points distinguishing the Samsung home surveillance camera is the fact that one does not have to pay ongoing fees for the monitoring service, by employing free services instead. Thus, rather than seeing the data services provided for the lifetime of the object as free, we might see them instead as prepaid. After all, it costs Samsung money to provide the data processing for such cameras.

Thus, it makes sense to see a Smart Object as both a good and an ongoing service, and any regulation thereof thus subject to both GATT and GATS disciplines. In *China – Audiovisual, the* Appellate Body affirmed that "a measure can regulate both goods and services and that, as a result, the same measure can be subject to obligations affecting trade in goods and obligations affecting trade in services."[20]

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products traded online although more established products, such as those of the communications industry, have also given rise to problems.").

[19] https://www.dropcam.com/cloud-recording. A user can prepay to obtain a $99/year price.

[20] Appellate Body Report, *China – Audiovisual*, paragraph 194, WT/DS363/AB/R (Dec. 21, 2009).

In *China – Electronic Payment Systems*, the WTO panel embraced a broad view of data operations as services. Consider the wide array of functions performed electronically that the panel recognized as services:

> The Panel recalls that the services at issue, as defined in the panel request, consist of a "system" that "typically includes" five elements, namely (i) the processing infrastructure, network, and rules and procedures that facilitate, manage, and enable transaction information and payment flows and which provide system integrity, stability and financial risk reduction; (ii) the process and coordination of approving or declining a transaction, with approval generally permitting a purchase to be finalized or cash to be disbursed or exchanged; (iii) the delivery of transaction information among participating entities; (iv) the calculation, determination, and reporting of the net financial position of relevant institutions for all transactions that have been authorized; and (v) the facilitation, management and/or other participation in the transfer of net payments owed among participating institutions.[21]

The data storage and processing required for a fitness tracker seem of a kind with the operations recognized as services in *China – Electronic Payment Systems*. Rather than supporting financial transactions, the data services from a fitness tracker support health monitoring and analysis.

In sum, it seems likely that the Dispute Resolution Body would conclude that fitness trackers were goods with embedded services, subject to both GATT and GATS disciplines. We turn next to the question of whether a rule distinguishing Smart Objects connected to foreign services could be barred because of the foreign nature of the services.

II. Privacy as Trade Barrier

Can a Smart Object be turned back at a national border because of its smarts? Or can such an object be rendered dumb, its smarts outlawed under local law? What challenges might a country have to a foreign measure that effectively barred its Smart Objects?

We consider here two challenges, one based on the national treatment obligation under GATT, and the other under the market access obligation in GATS. Other claims may well be available—e.g., under other GATT and GATS provisions, such as the most-favored-nations or non-violation claims, or the Agreement on Technical Barriers to Trade (which interestingly restricts itself to

[21] *China – Electronic Payment Systems*, para. 7.41.

goods). We focus here on the GATT national treatment and GATS market access claims because they present the most direct challenge to the crossborder data flow-based prohibitions of Smart Objects.

Take as our hypothetical two fitness trackers, one made by an American company and other by an Australian company. Both devices transmit information across the world, to servers in the United States and Australia, respectively.[22] Posit a ruling by the Australian Information Commissioner barring health information about Australian persons contained in such devices from being transmitted to the United States on grounds that such information would not be sufficiently protected under United States law. Note that such a regulation would not require barring the American fitness device at border checkpoints, the typical means of discriminating against foreign goods, but could be implemented through a rule requiring that the American tracker be reprogrammed to keep data within Australia. Posit that both fitness trackers are identical in observing, monitoring, communicating and recording the health information of the person wearing the device, but with one crucial difference--the location where information is stored and processed. The American fitness tracker transmits information to a server in California, where that information is processed and made available to the user, wherever he or she resides. The Australian tracker, on the other hand, uses only computers based in that country. We might note that while no U.S. fitness trackers have been outlawed thus far, this scenario is not entirely hypothetical. Australia in fact currently bars the offshoring of personally identifiable health information.[23] Moreover, the popular U.S. fitness tracker, Fitbit, makes it plain

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[22] This is consistent with the current practices of companies such as Dropcam, Fitbit, Nest, and Samsung. Privacy Policy, Dropcam, https://www.dropcam.com/privacy (last visited Oct. 14, 2014) ("When you use the Services, you are consenting to have your data transferred to and processed in the United States. . . . [W]e aren't able to process your information within the borders of any other country"). Fitbit Privacy Policy, Fitbit, http://www.fitbit.com/privacy (last visited Oct. 14, 2014) ("Fitbit's Services are hosted and operated entirely in the United States . . . . Any personal information that you provide to Fitbit . . . will be hosted on United States servers. You consent to the transfer of your personal information to the United States."). Privacy Statement, Nest, https://nest.com/legal/privacy-statement/ (last visited Oct. 14, 2014) ("Your personal information may be collected, processed and stored by Nest or its service providers in the United States and other countries where our servers reside.").

[23] Personally Controlled Electronic Health Records Act, 2012, § 77 (COM.LAW.GOV.AU), http://www.comlaw.gov.au/Details/C2012A00063/Html/Text#_Toc327957207 (last visited March 8, 2014) ("The System Operator … must not: (a) hold the records, or take the records, outside Australia; or (b) process or handle the information relating to the records outside Australia; or (c) cause or permit another person (i) to hold the records, or take the records, outside Australia; or (ii) to process or handle the information relating to the records outside Australia."). Subsection 2 permits the transfer, processing, or handling of data outside of Australia if such records do not include "personal

that data from users outside the United States is nonetheless stored in the United States, and its privacy policy requires that "You [the user] consent to the transfer of your personal information to the United States."[24] The similarly popular U.S. fitness tracker, Jawbone Up, also informs its global users that their data "may be processed by us in the United States."[25]

A. GATT—National Treatment

Would such an Australian requirement applied to American fitness trackers violate the national treatment obligation under GATT? GATT Article III:4 provides the basic rule that products from one member state "shall be accorded treatment no less favourable than like products" produced domestically. The United States will argue that the Australian measure is not "origin-neutral," by barring fitness trackers that utilize United States servers. Australia will respond that the measure is indeed origin-neutral because it requires that the data be stored and processed in a jurisdiction with adequate data protection, and that it does not prefer Australia on its face. Australia would likely contest two parts of any American case against its measure, arguing that the health privacy measure treated both products alike, and that in any case the two products are not alike.[26]

Charged with the burden of proof for the affirmative case, the United States would seek to show, with respect to the first issue, that the regulation preventing health information from being transferred overseas is discriminatory on its face by preferring objects that employ Australian data service providers. Australia, on the other hand, would argue that it grants both formal and effective equality to the American device, permitting its importation and operation as long as it complies with facially neutral domestic law. While formally different

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information in relation to a consumer" or "identifying information of an individual or entity." *Id.* § 77(2).

[24] Fitbit, Fitbit Privacy Policy, http://www.fitbit.com/privacy (last visited Aug. 15, 2014). South Korea-based Samsung, which makes a popular competitor device, informs users that: "The data that we collect from you may be transferred to, stored at or otherwise processed in a destination outside the European Economic Area ('EEA'), including but not limited to South Korea." Samsung, Electronics Privacy Policy (last visited Aug. 15, 2014).

[25] https://jawbone.com/legal/privacy (last visited Aug. 17, 2014).

[26] Thus, Australia's defense would likely be that two of the three elements of a violation under Article III:4, as set out by the Appellate Body, are absent: "For a violation of Article III:4 to be established, three elements must be satisfied: that the imported and domestic products at issue are 'like products'; that the measure at issue is a 'law, regulation, or requirement affecting their internal sale, offering for sale, purchase, transportation, distribution, or use'; and that the imported products are accorded 'less favourable' treatment than that accorded to like domestic products." Appellate Body, *Korea — Various Measures on Beef*, para. 113.

treatment alone is not sufficient to establish less favorable treatment,[27] here the good with the foreign component is clearly disfavored. Because goods made abroad are more likely to employ data services based abroad, a rule that prefers goods that employ data services at home effectively disfavors foreign goods suppliers. Australia might counter that the American company need merely to use local servers for its data storing and processing, but this advantages the Australian product manufacturers who are more likely to already employ local data services, and it disadvantages American competitors who will likely need to spend more money to deploy local data infrastructures.

The United States will argue that the American product is "like" the Australian product, along all the relevant dimensions. The "nature and extent of a competitive relationship"[28] between the two products is plain, the Americans will press. The United States will point to the physical properties, end-uses, consumer preferences, and customs classification as pointing to likeness, though these factors enunciated by the Working Party in *Border Tax Adjustments*[29] and elaborated upon by the Appellate Body in *EC—Asbestos*[30] should not be applied formalistically.

It is unclear whether the privacy and security concerns can be considered in the "likeness" inquiry, or in the exceptions inquiry alone (we turn to the exceptions below). In *EC—Asbestos*, the Appellate Body observed that consumer attitudes towards the safety of a product would be relevant to the determination of likeness.[31] The security of health information in the respective fitness trackers might factor into the analysis at this juncture. Australian will likely argue that consumers care deeply about their privacy and believe it best protected by keeping information in Australia, while the Americans argue that Australians are likely to believe that their health information is safe in the United States. Will the location of the data services used by two fitness trackers have bearing in the marketplace?

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[27] Appellate Body, *Korea—Various Measures on Beef* at para. 135.

[28] Appellate Body Report, EC — Asbestos, para. 99 ("a determination of 'likeness' under Article III:4 is, fundamentally, a determination about the nature and extent of a competitive relationship between and among products.").

[29] Border Tax Adjustments, 2 Dec. 1970, GATT BISD (18th Supp.), at 97 (1972). The Working Party did not include customs classification as a factor in *Border Tax Adjustments*, but

[30] EC—Asbestos, WT/DS135/AB/R, para. 101; China—Audiovisual Services, WT/DS363/R, para. 7.1445

[31] *Appellate Body Report, EC — Asbestos, para. 122* ("[C]onsumers' tastes and habits regarding *fibres*, even in the case of commercial parties, such as manufacturers, are very likely to be shaped by the health risks associated with a product which is known to be highly carcinogenic. A manufacturer cannot, for instance, ignore the preferences of the ultimate consumer of its products.").

Does "physical characteristics" include the physical location of the data services that the object employs? Or is it limited to the four corners of the object itself? In *EC—Asbestos*, the Appellate Body advised that "In particular, panels must examine those physical properties of products that are likely to influence the competitive relationship between products in the marketplace."[32] This seems to lead back to consumer tastes. But what if the Australian public is largely unconcerned, but the Australian authorities more worried about supposed risks to health privacy from offshoring?

It seems likely that the Dispute Resolution Body would conclude that the treatment accorded to the American product would be less favorable than that provided to the Australian product, but it is unclear whether the Dispute Resolution Body would rule that they are like products.

If the goods are determined to be alike, and the foreign supplier disadvantaged by the Australian measure, then Australia would have the burden to show that the derogation from the GATT obligation was justified under an Article XX exception, either as "necessary to protect public morals," or as "necessary to protect human … health."

The WTO has interpreted "public morals" as "standards of right and wrong conduct maintained by or on behalf of a community or nation."[33] Australia will argue that standards of privacy are culturally driven and reflect a public consensus on morals. The United States will argue that the use of American fitness trackers does not implicate Australian public morals.

Australia will seek to show alternatively that the measure is justified to protect public health. It will argue that individuals will be reluctant to obtain diagnosis of an illness, for example, if that diagnosis might be made public. A threat to health privacy, under this analysis, becomes a threat to health. The United States will argue that health privacy and health should not be conflated, and that release of the kinds of information held by a fitness tracker would not deter individuals from using such devices.

The United States will not challenge the expressed Australian desire to protect the privacy of health information,[34] though it will challenge the necessity

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[32] EC—Asbestos, para. 114.

[33] This was initially enunciated in the context of GATS Article XIV by the panel in *US – Gambling*, para. 6.465, and then extended to GATT Article XX by the Appellate Body in *China-Publications and Audiovisual Products,* para. 7.759. For a discussion of the earlier case, see Note, Mark Wu, *Free Trade and the Protection of Public Morals: An Analysis of the Newly Emerging Public. Morals Clause Doctrine*, 33 YALE J. INT'L L. 215 (2008).

[34] EU – Seals, Appellate Body, note 1253 ("We note that the panel in *EC – Asbestos* took a similar position in the context of Article XX(b) when it stated that, although it must examine the particular health risk posed by chrysotile asbestos fibres, it was not required to assess France's choice to protect its population against that risk. (Panel Report, EC – Asbestos, paras. 8.170 and 8.171).").

of barring American fitness trackers to achieve that goal. The United States will argue that both American law and enforcement provide adequate protections for Australian citizens, and therefore barring United States servers cannot be necessary to protect either morals or health.

In *China-Publications and Audiovisual Products*, the Appellate Body concluded that China had failed to demonstrate the necessity of its measures protecting public morals via censorship because less trade restrictive alternatives were reasonably available to achieve those goals. The United States will offer a similar argument—perhaps offering an alternative such as privacy protecting model clauses that American fitness trackers could abide by to ensure health privacy.

B. GATS—Market Access

The United States challenge under GATS would certainly include both market access and national treatment claims, but we focus on market access here.

The initial question will be whether Australia has in fact committed to liberalize trade in the particular services at issue in the case. The answer will depend on how one classifies the particular services: Australia has committed to liberalize "[c]omputer and related services—data processing services,"[35] but has not committed to liberalize most health services. Australia has also committed to liberalize "[c]ommunication [s]ervices: telecommunication services: On-line information and database retrieval—None, modes 1 -3.[36] The WTO Secretariat recognized the "considerable overlap" between the categories of computer and related services and telecommunications services: "Given the interplay between the two sector's listed activities, it may not be clear when telecommunications services, computer services, or both are being supplied."[37]

Australia will argue that the data storage and processing conducted by the fitness tracker's offshore computers constitute a health service—specifically, monitoring health—and that therefore Australia has made no trade commitment in that regard. The United States will argue that the services that are being barred are technical computer services consisting in data processing and online information and database retrieval, and thus clearly encompassed by Australia's commitments. A note from the European Union seeks to read "computer and related services" narrowly, excluding, for example, accounting, architectural, audiovisual and educational services—but that note is not necessarily binding on

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[35] GATS/SC/6, page 11.

[36] Id. at page 24.

[37] World Trade Organization, Background Note by the Secretariat on Computer and Related Services, S/C/W/45, 14 July 1998. For a discussion of overlapping classifications in the GATS schedules, see ROLF A. WEBER & MIRA BURRI, CLASSIFICATION OF SERVICES IN THE DIGITAL ECONOMY 91-96 (2012).

the WTO.[38] The United States will further argue that if there are overlaps between service classifications, choosing the less liberalized classification would erode the free trade commitments in the schedule.

If the Dispute Resolution Body concludes that Australia has scheduled the services involved in the dispute, it will then readily conclude that Australia has violated its market access commitment. After all, as the Appellate Body decision in *United States—Gambling* demonstrated, the obligation to provide market access for mode 1 includes the ability of the supplier to do so cross-border from their home country. Again, under *United States—Gambling*, a flat prohibition operates as a zero quota, impermissible under market access.

The key will be whether Australia is successful in relying on a GATS Article XIV exception to defend its measure. Australia will argue that the measure is necessary to protect public order, public morals, and health, but also to protect privacy. With the addition of the public order and privacy exceptions, GATS offers more exceptions than GATT. While it might seem to be written precisely for such occasions, the language of the privacy exception is relatively narrow; the measure must be:

> necessary to secure compliance with laws or regulations which are not inconsistent with the provisions of this Agreement including those relating to: … the protection of the privacy of individuals in relation to the processing and dissemination of personal data and the protection of confidentiality of individual records and accounts…

Here, the United States will argue that the laws and regulations are themselves inconsistent with the treaty obligations by disfavoring foreign suppliers. It will then argue that the privacy objectives can be achieved in other ways, and are therefore not "necessary."

III. Conclusion

On a Sunday late in April 2014, a fire on the fourth floor of a Samsung office building in Gwacheon, South Korea caused Samsung Smart TVs all across the United States and Europe to blink off. Even if the Samsung Smart TV itself is in Kansas, its brains, memory, or both reside in Korea.

Technology is fast creating a world that international law will find difficult to recognize. We are increasingly interconnected in ways that most of us do not even realize. A minor fire in Korea might cause outages across the world. This is the international trade version of the butterfly effect.

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[38] WTO, Communication from the European Communities and its Member States, Draft consolidated
GATS Schedule, S/C/W/273, October 9, 2006, 90.

International trade law must grapple with the ways that the very ontology of things is changing.