

Preliminary analysis of aspects of some WTO e-commerce proposals – MC11 briefing paper^a

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Introduction

This analysis examines some of the implications of some aspects of the e-commerce proposals made at the World Trade Organization (WTO) by the European Union (EU) et al, Japan and the USA.^b There is currently no mandate to negotiate e-commerce rules at the WTO. At the WTO, the current mandate is merely to examine various e-commerce issues.¹ However, at the WTO Ministerial Conference in Buenos Aires from 10-13 December 2017 (MC11), there is a proposal to begin negotiations on e-commerce rules² (presumably such as those in this paper).

They include investment rules that go beyond the WTO's Agreement on Trade-Related Investment Measures (ie TRIMS+), even though investment is not an issue that can be negotiated in the Doha Round³.

None of these proposals include any special and differential treatment or exceptions for least developed countries (LDCs).

Restrictions on local content requirements

The EU et al⁴ and perhaps MIKTA^c have proposed disciplines on 'local content requirements' subject to appropriate public policy exceptions.

This is also in the Trans-Pacific Partnership (TPP)⁵ and was proposed in the Multilateral Agreement on Investment (MAI)^d which was never concluded due to strong opposition.⁶

^a By Sanya Reid Smith, Legal Advisor, Third World Network, 10 December 2017.

^b See for example JOB/GC/97/Rev.3, JOB/GC/100 and JOB/GC/94. These WTO documents are available from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx. For the purposes of this note, the WTO proposals without any exceptions will generally be used.

^c They took note of the key message re negotiating disciplines on localisation and since three of the MIKTA countries (Mexico, Korea, Turkey) are part of the EU et al's proposal where disciplines on localisation include on local presence requirements, that may be what they intend.

^d Which was negotiated by the Organisation for Economic Co-operation and Development (OECD) countries and the European Commission, *Multilateral Agreement on Investment*, <http://www.oecd.org/investment/internationalinvestmentagreements/multilateralagreementoninvestment.htm>.

‘local content’ has not been defined in their proposals. An expert on international investment agreements (IIAs) notes that ‘Domestic content can be interpreted broadly as covering measures that can be satisfied through domestic expenditures on labor, services, and/or goods. . . In particular, as can be seen in the excerpt from the Japan-Mongolia FTA, IIAs often contain (1) restrictions on requirements to use local providers of goods; (2) restrictions on requirements to use local providers of services; and (3) restrictions on targets for “domestic content”. In order for “domestic content” to have any meaning in the treaty, it is arguable that it goes beyond use of domestic goods and services, and also prohibits targets on use of domestic labor or other expenditures.’⁷

If this covers both goods and services, then this is more restrictive than TRIMS, because TRIMS only applies to goods.⁸ Even if it only applies to goods, it is TRIMS+ because:

- It does not have the transition period that least developed countries (LDCs) at the WTO still have for TRIMS⁸. For example under WTO rules, an LDC can still require that a hotel (whether operated by a foreign or local company) buy its food, towels and sheets from local companies; but this would not be possible under this proposal which does not include any exceptions for LDCs.
- It does not allow for developing countries to have another transition period for TRIMS (which is being negotiated at the WTO⁹).
- ‘The TRIMs Agreement incorporates exceptions in the GATT, including the GATT’s general exceptions, an exception for government procurement, and certain flexibilities for developing countries’¹⁰ Will these WTO exceptions apply to these proposed ecommerce rules?

‘According to British Petroleum (BP) and Anglo American, for example, they spent an estimated 87% and 64%, respectively, of total value created on suppliers in 2014. These expenditures dwarf tax and royalty payments which, for BP and Anglo American, amounted to 2% and 11%, respectively. These figures help explain why governments are increasingly seeking to require or encourage extractive industry firms to purchase goods and services from domestic providers.’¹¹ If agreed to, these TRIMS+ proposals would mean that benefits such as those outlined below would not be available to WTO Members, unless relevant exceptions are agreed:

‘Studies have shown that TNC affiliates in developing countries tend to buy the bulk of their inputs from their parents or other associated suppliers and hence generate few domestic linkages. . . Local content requirements, therefore, may force TNCs to identify nascent local capabilities and provide them with know-how and technology. . . A number of theoretical and empirical studies have shown local content requirements to have welfare-improving and favourable developmental effects for host countries. . . Balasubramanyam (1991) argues that the dynamic benefits resulting from local content requirements such as the development of local supplier capabilities far outweigh the short-run welfare losses that they may impose. . . Lahiri and Ono (1998) develop a partial equilibrium model of an oligopolistic industry and show that local content requirements imposed on foreign firms increase employment in host countries.’¹²

For example ‘When oil was first discovered offshore in 1969, Norway did not have the expertise to supply offshore oil rigs. But within roughly thirty years, companies were sourcing more than 50% of capital inputs and more than 80% of operations and maintenance inputs from Norwegian firms. The acquired expertise has also enabled Norwegian firms to expand into export markets, with exports comprising nearly half of their sales by the early 2000s. Norway achieved these results through a mix of various measures. In 1972, for example, Norway passed the Royal Decree, requiring all operations to source from Norwegian companies unless the Norwegian suppliers were not competitive in terms of quality, service and price. The 1985 Petroleum Act further stipulated local content provisions to be used when allocating licenses in the North Sea. As a result of these measures, Norway provided preferential treatment to Norwegian companies in all bidding rounds between 1974 and 1994. . . It is estimated that in 2014 the oilfield services industry was one of the largest contributors to the Norwegian economy with 1,100 companies employing 122,000 people.’¹³

⁸ Eg under existing TRIMS rules, an American television (TV) station in Turkey cannot be required to buy Turkish television screens for its offices.

In addition, even restricting requirements to use local goods/services may be interpreted more broadly, for example: ‘As suggested in at least one arbitral decision, IIA provisions preventing requirements on investors to use or accord a preference to local providers of goods or services may prohibit measures requiring R&D, headquarters, or other operations to be located in the host country’ or education and training.¹⁴

Furthermore, in the Mobil v NAFTA case, the investor-to-state dispute settlement (ISDS) ‘tribunal seemed to equate domestic expenditures on services (even intra-firm expenditures) with purchase or use of services from local providers.’¹⁵

Implications for local culture on TV etc

If the restrictions on local content apply to services (eg requiring a foreign hotel to use local cleaning/accounting/advertising companies), this may prevent WTO Members from requiring television stations to broadcast locally made programs for a certain number of hours per day, unless it is covered by ‘appropriate public policy exceptions’. These kinds of local content requirements in television (TV), radio, cinemas and in advertising^f are used by a number of WTO Members (such as Australia and Malaysia^g) to ensure that local culture and languages are reflected in these media instead of US TV programs which are often cheaper due to the large audience in the USA covering the costs of production, eg:

In submissions to the Australian government in the lead-up to trade negotiations, Australian government film agencies¹⁶ noted that:

‘If subject only to commercial considerations, many local cultural industries would be quickly replaced by those from countries with greater financial muscle due to their multinational presence, market dominance and significantly larger populations. In particular, the United States dominates global trade in cultural goods and services.

Australia's demographics and isolation are inescapable realities that mean our domestic audience base alone cannot sustain the arts, entertainment and audio-visual industries, therefore these will always need indirect and direct Government support.

"Government support for the sector is therefore provided in areas of greatest market failure - those links in the value chain where activity would not occur, or would fall to levels likely to threaten industry sustainability in the absence of subsidy." . . .Australia's unique demographic and geographic position dictate that market forces alone are rarely sufficient to allow cultural organisations and individuals to be fully self-sufficient. This is due to the inability of cultural industries to generate advertising revenue from a limited domestic market to recoup costs and sell cultural services.’¹⁷

These concerns extend to advertising as well. For example ‘important social and cultural benefits accrue to the community from the television commercials quota:

- Commercials are cultural products and contribute to the overall Australianness and character of the television viewing experience;
- The production sector for commercials substantially overlaps and is interdependent with the production sector for film and television. Total deregulation of the commercials sector will have a significant impact on the capacity of the production industry to produce Australian films and television programs;’¹⁸

Requirements to have locally made programs on TV and radio and a certain number of days showing locally made films in cinemas/year have been a politically sensitive issue in a number of countries.

^f Since producers of TV programs often make advertisements as well and cross-subsidise their production of dramas, comedies, documentaries etc from the revenue they make from making commercials, see below.

^g Eg in Malaysia ‘Eighty percent of TV programming must originate from local production companies owned by ethnic Malays and 60 percent of radio programming must be of local origin.’ Office of the United States Trade Representative, *2015 National Trade Estimate Report on Foreign Trade Barriers*, <https://ustr.gov/about-us/policy-offices/press-office/reports-and-publications/2015/2015-national-trade-estimate>

For example:

- Korea, had a requirement for cinemas in Korea to show Korean movies for 146 days each year which has helped the Korean film industry to grow to its current strength.¹⁹ However it was a controversial precondition to even start its USFTA negotiations that this had to be halved to only 73 days/year²⁰ (so that American movies could make more money in Korea by being shown in Korean cinemas for more days/year). U.S. movie producers and distributors then wanted a further reduction in the number of days Korean cinemas can be required to show Korean movies during the negotiations.²¹ In 2016, 'In Korea, foreign programs may not exceed 20 percent of terrestrial TV or radio broadcast time or 50 percent of cable or satellite broadcast time determined on a semi-annual basis. Within those overall quotas, Korea maintains annual quotas that further limit broadcast time for foreign films to 75 percent of all films for terrestrial broadcasts and 80 percent for cable and satellite broadcasts. Foreign animation is limited to 55 percent of all animation content for terrestrial broadcast and 70 percent of all animation content for cable and satellite broadcasts. Foreign produced popular music is limited to 40 percent of all music content. Another quota, applied on a quarterly basis, limits content from any one country to 80 percent of the quota available to foreign films, animation, or music.'²²
- it was a campaign promise in New Zealand to have local content on TV, but when the party was elected, it was told it was not possible because of its services commitments at the WTO. The New Zealand Prime Minister said 'We have unilaterally disarmed ourselves on trade but very few others have been so foolish. We're now left with perfectly legitimate calls for local content and people saying 'You can't do that because of GATS'.²³

Restrictions on the ability to require use of local technology

The USA's ecommerce proposal includes a TRIMS+ proposed ban on requirements to use local technology.²⁴ This is something the US has recently included in the investment chapter of its free trade agreements such as the Trade In Services Agreement (TISA)²⁵ and the TPP²⁶ as well as being in the USA's 2012 Model Bilateral Investment Treaty (BIT)²⁷. However in TISA, the TPP and the US Model BIT, this was on a negative list basis and there were also a few partial general exceptions. The USA's ecommerce proposal at the WTO on this issue has no exceptions whether general or scheduled for each country (unlike some of its other proposed rules in the same document).

This proposal is a restriction on performance requirements. 'Performance requirements are stipulations, imposed on investors, requiring them to meet certain specified goals with respect to their operations in the host country. They are and have been used by developed and developing countries . . . to enhance various development objectives.'²⁸ Eg they can include requirements that foreign investors must buy inputs or employ locals from the country they are investing in (the 'host country') in order to maximise the benefits of the foreign investment for the host country's economy and society including job creation, linkages to the local economy and diversification.²⁹ Other performance requirement 'policy aims include establishing and deepening linkages between foreign investment and the domestic economy that will promote domestic development; building local skills, capacity and employment; encouraging specific types of activities such as research and development (R&D) in the host country; securing domestic support for policies such as encouraging deployment of renewable energy; and promoting technology exchange between foreign and domestic companies.'³⁰

In the context of similar performance requirements in IIAs, an expert noted that 'Although only a minority of IIAs contains express restrictions on performance requirements, those IIAs have deep and broad impacts.'³¹

Restrictions on performance requirements can also undermine the ability to achieve the Sustainable Development Goals (SDGs).³²

If accepted, this proposal would prevent WTO Members (eg Mauritius) from requiring companies **from any country** to buy and use Mauritian technology. This proposal seems to be aimed at policies such as China's which was seen as an indirect local content requirement. China developed its own WLAN standard and for devices sold in China to gain access to public networks in the country, they must support this standard which is owned and controlled by a group of China-based chipset

manufacturers. Therefore ‘the U.S. government, and industry saw this as a ploy to force companies to purchase chips from domestic Chinese manufacturers.’³³ Direct requirements for locally made products as inputs are currently prohibited for WTO member countries (except LDCs) and this proposal would restrict WTO Members from following China’s example and circumventing this by requiring the use of local technology instead.

Restrictions on technology transfer requirements

The USA’s WTO ecommerce non-paper proposes a TRIMS+ **total ban** on technology transfer requirements for companies **from any country**.³⁴ Whereas restrictions on technology transfer in the TPP’s investment chapter³⁵ and US Model BIT³⁶ are on a negative list basis and with some general partial exceptions. The USA’s ecommerce proposal at the WTO on this issue has no exceptions whether general or scheduled for each country (unlike some of its other proposed rules in the same document).

In 1989, of 31 developing countries studied, 11 had technology transfer requirements.³⁷

An example of a technology transfer requirement is in Taiwan where ‘In some cases, the government gave approval for investment on the condition that the TNC help its domestic suppliers to upgrade their technology’.³⁸ Similarly Norway developed expertise in supplying offshore oil rigs (see above) via various performance requirements including that ‘The licenses also included provisions requiring the transfer of skills and technologies to Norway’s infant domestic petroleum industry.’³⁹

Local content rules had been a way of obtaining technology transfer in the past.^h A famous example is the Singer Sewing Machine Company which was allowed into Taiwan in 1964 on condition that Singer must buy 80% of the parts for the sewing machines from Taiwanese companies within one year.⁴⁰ To achieve this, the company offered training seminars, provided standard blueprints to its parts producers, supplied them with tools and fixtures, and gave technical assistance and by 1967 Singer's exports used all locally made parts except needles for its straight stitch model.⁴¹ Since requiring local products as inputs is no longer allowed for WTO member countries (except LDCs, see above), countries may instead wish to require technology transfer directly (something which is still allowed by TRIMS), but this would be restricted by this proposal if it is accepted.

The US is even proposing a ban on requiring the transfer of a production process. An example of a production process could be how to plug an oil well. ‘the amount of knowledge required in production processes has grown remarkably.’⁴² and innovative firms are unwilling ‘to provide knowledge of their production processes to firms in developing countries’⁴³, so without a requirement to do so, service suppliers are unlikely to willingly transfer their production processes.

This restriction on requiring technology transfer could be interpreted broadly to also include restrictions on requiring activities such as providing employee training.⁴⁴

Disciplines on local presence requirements

This appears to be part of the EU et al’s ecommerce proposal⁴⁵ and perhaps MIKTA’sⁱ.

The Trade In Services Agreement (TISA)⁴⁶ and US free trade agreements (FTAs) such as the Trans-Pacific Partnership (TPP)⁴⁷ have restrictions on a negative list basis on local presence requirements. The EU et al and MIKTA note that these proposed restrictions on local presence requirements can be subject to appropriate public policy exceptions. It is not clear if they would also allow scheduled exceptions that are different for each WTO Member (eg on a negative list basis).

^h Eg Stephan Haggard and Yu Zheng, *Institutional Innovation and Private Investment in Taiwan*, ‘Singer was subject to stringent local content requirements that could only be met through effective technology transfer to suppliers’,

http://siteresources.worldbank.org/INTEXP/COMNET/Resources/Institutional_Innovation_and_Private_Investment_in_Taiwan.doc

ⁱ They took note of the key message re negotiating disciplines on localisation and since three of the MIKTA countries (Mexico, Korea, Turkey) are part of the EU et al’s proposal where disciplines on localisation include on local presence requirements, that may be what they intend.

This proposed restriction would prevent a WTO Member (eg Pakistan) from requiring a service company from another country (eg the USA) to have an local presence (eg office/ branch/ company/ subsidiary etc?) as a condition of supplying a service to Pakistan, subject to appropriate (presumably agreed) public policy exceptions. This has a number of implications including that WTO Members would need to think carefully about all the laws, regulations and policies in all the current service sectors that can be affected by a lack of local presence (eg employment, taxation, financial regulation, fraud, consumer protection etc, see below) and try and get exceptions for all of them.

As the United Nations Conference on Trade And Development (UNCTAD) notes: ‘In some countries, a specific requirement, arising out of the particular nature of some services, is the local presence requirement. This is a kind of duty of establishment which requires a firm to place the business itself within a locally registered and licensed corporate entity.’⁴⁸

There are a number of reasons countries require local presence and some of these are noted below.

Some implications for employment generation

‘local presence requirements may be introduced to ensure more developmental benefits for the host country, for example, in terms of creating new jobs. A number of Canadian and United States free trade agreements (FTAs), in their services chapters, prohibit signatories from requiring a service provider of the party to establish or maintain a representative office or any form of enterprise in the territory of the other party as a condition of providing services in the territory of that latter party.’⁴⁹

An example of a country requiring local presence is ‘Samsung Electronics invested in Viet Nam to produce television sets, monitors and other home appliances to service the local market because Viet Nam requires foreign companies to establish production facilities in Viet Nam in order to sell their products to the Vietnamese market’⁵⁰

Some implications for the ability to effectively regulate the financial sector

If these proposed restrictions on local presence requirements apply to financial services, the issues raised below become relevant, including the World Trade Organization (WTO) Secretariat noting that:⁵¹

- ‘The dramatic increase in the use of Internet in the last decade has led to a new organizational form in banking: the Internet-only or virtual bank. These banks do not have a branch network, but a limited physical presence, for example, an administrative office or facilities such as ATMs.’
- Challenges for regulators include ‘The changing financial landscape has brought with it new risks and challenges for financial institutions’ management, and for regulation and supervision. The major ones stem from increased supply of services across-border resulting from drastically lower transaction costs and the greater ease and speed of financial activities (Nsouli and Schaechter, 2002). Although these risks are not new, cross-border financial services can increase some of them, such as strategic, operational, reputational, and legal risks. . . Legal and regulatory risks arising from the supply of financial services electronically is another area of concern for financial services in general. Financial institutions can potentially expand the geographical scope of their services faster through electronic means than through traditional means (including establishment abroad). While some of these uncertainties pre-date the development of the Internet and affect traditional cross-border financial services, the use of the electronic delivery channel facilitates the offering of services on a cross-border basis and thus increases these challenges. . . For example, in some jurisdictions, banking supervisors may not have the authority to impose local licensing requirements on banks that provide cross-border e-banking services to local residents. . . The recent case of Icesave provides a dramatic example of the risks that may arise to consumers in host countries from the operations of foreign banks through a combination of delivery channels – Internet and branch form in this case.’

According to UNCTAD, local presence requirements ‘can be the case, for example, with respect to financial services, where, the need for prudential supervision is difficult to achieve without the physical presence of the related assets of the businesses in the markets they serve. A further reason

concerns the regulatory authorities' ability to recover assets of suppliers, should the need to do so arise. As an alternative to local establishment, a country may allow foreign suppliers of services to operate in its markets as long as they provide a suitably large deposit to cover their potential liabilities with an institution within the host country, as determined by the host country government or a regulatory authority.⁵² Similarly, in the context of financial services, Philip Wood QC noted that 'regulators cannot enforce their regulatory orders against foreigners unless they have a local presence or deposit caution money within the jurisdiction.'⁵³

Since some countries negotiating TISA have said they want the TISA rules brought into the WTO,⁵⁴ if this occurs, this option to require a deposit in the host country would not be permitted for reinsurance if the Swiss proposal on prohibiting local collateral requirements in the TISA financial services annex is accepted without exceptions.⁵⁵ Therefore if this proposal on local presence and the Swiss proposal prohibiting local collateral requirements are both accepted without the relevant exceptions, then in the example above, a US reinsurance company could provide reinsurance services in Pakistan without having a subsidiary, or branch, or any collateral held in Pakistan. If a claim on the reinsurance was then made in Pakistan (eg due to a natural disaster such as an earthquake) and the US reinsurance company did not or could not pay out (eg due to the size of the disaster), there would be no collateral/branches/subsidiaries' assets to seize in Pakistan. Reinsurance companies have failed in the past.⁵⁶

As noted above, this proposal could also apply to financial services, even though:

- The WTO Secretariat notes that regulatory approaches in banking include the 'Basel Concordat': 'However, practical problems arise when trying to enforce the Concordat principles to situations where a bank engages in cross-border e-banking activities and does not have a local physical presence.'⁵⁷
- This is being proposed as countries are still recovering from the global financial crisis, where some of the problems in this financial crisis were due to lack of sufficient local presence (see IceSave operating through branches instead of subsidiaries, discussed below).
- Some WTO Members such as New Zealand have been trying to get banks from other WTO Members to incorporate as subsidiaries instead of branches.^j
- financial regulators are currently moving towards requiring foreign firms to operate through even stronger forms of local presence (eg subsidiaries which must have local capital in the country they are operating in etc rather than branches).^k For example:

^j Steps were 'taken to try and get Westpac, in particular, to establish a New Zealand incorporated subsidiary, which was seen as being of particular importance because, as a branch, there was a concern that Australian depositors might be given priority in terms of the repayment of New Zealand deposits (reflecting the priority given under the Australian Banking Act).' David Tripe, Centre for Financial Services and Markets, Massey University, 1 November 2012, *Regulation in New Zealand Banking and Financial Services*, <http://www.nzfc.ac.nz/archives/2013/papers/updated/57.pdf>

^k Eg 'Recent moves towards greater reliance on subsidiarisation in several jurisdictions indicate that major national regulators are not convinced of being able to count on a favourable outcome for the single point of entry (SPE) approach [involving branches]. . . The IMF, while acknowledging the cost advantages of cross-border branching for some categories of banking group (in particular for those with primarily wholesale operations), has nonetheless drawn attention to the advantages of the subsidiary structure for the purpose of crisis management and resolution during banking crises (J. Fiechter, I. Otker-Robe, A. Ilyina, M. Hau, A. Santos, and J. Surti, Subsidiaries or Branches: Does One Size Fit All?, IMF Staff Discussion Note, 7 March 2011: chapter II). . . [countries have an] increasingly favourable view of subsidiarisation as the appropriate corporate form for cross-border banks, since this choice can be protective of a country's interests owing to the way in which the losses of an insolvent cross-border banking group are assumed in the jurisdictions in which loss-making entities are legally incorporated', *Resolution Strategies and Loss-Absorption Capacity for Systemically Important Banks*, Andrew Cornford, http://www.networkideas.org/featart/feb2015/pdf/Resolution_Strategies.pdf

- a 2010 International Monetary Fund (IMF) paper advised that ‘in the absence of well-defined cross-border burden sharing arrangements, economies with large banking systems can help defray crisis risks through:
 - Effective regulation and supervision. This can be achieved through a more hands -on approach and/or more stringent regulatory ratios. Subsidiarization of foreign operations may also help in these types of economies by lowering fiscal and foreign currency risks, although other considerations are important for this choice. . .
 - The choice between foreign subsidiaries and branches largely reflected bank business decisions rather than lender of last resort considerations. These different ownership structures mattered for the potential fiscal liabilities of home countries over the crisis. Subsidiaries are independently capitalized and under the host country supervision, while home regulators are typically responsible for branches (particularly in Europe).⁵⁸
- a 2014 IMF paper on Cross-Border Bank Resolution:
 - suggests that effective cross-border resolution ‘might include the establishment of self-sufficient subsidiaries and/or restrictions on intra-group flows, with a view to ensuring that entities in the group can operate—and be resolved—on a stand-alone basis. . .
 - From the perspective of financial stability, a branch structure unequivocally puts responsibility for soundness on the parent institution, while a subsidiary structure can limit losses at the host level, should the parent come under stress (given local capital and liquidity requirements). . .
 - Subsidiarization ex ante is likely to be a superior strategy to ring-fencing ex post. . .
 - Where small hosts cannot ensure their capacity to achieve these outcomes through ex ante agreements on cooperative resolution strategies and burden sharing, measures ensuring local operations are resolvable through structural requirements, such as requiring local capital and liquidity via subsidiarization or asset maintenance requirements for branches, may be appropriate.’⁵⁹
- When British regulators accepted IceSave accounts through Landsbanki bank as a branch⁶⁰ they then had great difficulty in getting British deposits (by ordinary people and local governments) back when Landsbanki closed down in the current financial crisis.¹ Even so, since there were branches with some assets in the United Kingdom (UK), when the British government used anti-terrorism laws to freeze assets in Landsbanki branches in Britain, that amounted to about 4 billion euros.⁶¹ Under this proposal, since governments could not even require branches (unless there is an exception), even this amount would not be available if a bank collapses.
- ‘By contrast, Swiss banks’ U.S. broker-dealers used for investment banking operations had to be independently capitalized subsidiaries, helping to cushion the blow to Swiss taxpayers when the crisis hit. . . The contrasting outcomes of resolutions of Icelandic bank subsidiaries versus branches suggest subsidiarization can lower fiscal risks for countries with large banking systems.’⁶²

Would the WTO’s prudential defence⁶³ apply to these proposed ‘ecommerce’ rules? Even if it does, the prudential defence has been heavily criticised⁶⁴ and a number of governments have found it necessary to fix it in their free trade agreements (FTAs), see below, so the WTO version may not be an effective safeguard.

¹ For more information about the IceSave crisis, see for example Iceland Ministry for Foreign Affairs, *Questions and Answers*, <https://www.mfa.is/tasks/icesave/q--a/>; International Monetary Fund, *Cross-Border Bank Resolution: Recent Developments*, June 2014, <https://www.imf.org/external/np/pp/eng/2014/060214.pdf> and International Monetary Fund, *Iceland: Ex Post Evaluation of Exceptional Access Under the 2008 Stand-by Arrangement*, IMF Country Report No. 12/91, April 2012, <https://www.imf.org/external/pubs/ft/scr/2012/cr1291.pdf>

Some implications for other types of regulation

‘Local presence is often a key element in assessing the applicability of domestic laws and protections to foreign companies. In the absence of a local presence obligation e-commerce companies could, therefore, insulate themselves from domestic laws (for better or worse). Cross-border duties and taxation of electronic services has also proven a controversial topic, with some claiming that digital service providers situated abroad attempt to bypass domestic tax structures applicable to competing services.’⁶⁵

Lack of local presence could also have implications for employment law⁶⁶ and other aspects of government regulation. This is because for laws to be effective, they need to be enforceable. ‘And in general a nation can only enforce its laws against: (i) persons with a presence or assets in the nation’s territory; (ii) persons over whom the nation can obtain personal jurisdiction and enforce a default judgment against abroad; or (iii) persons whom the nation can successfully extradite.’⁶⁷ Since not all WTO Members have extradition treaties with each other and even where there are extradition treaties, they only apply to extraditable offences (which may only be criminal offences and even then may not include fraud,⁶⁸ let alone civil fraud etc where cases are brought by the consumer who suffered the damage⁶⁹), option (iii) is unlikely to be sufficient. There are also restrictions on obtaining personal jurisdiction as the article written in the context of cyberspace ecommerce notes.⁷⁰ Therefore restrictions on local presence can significantly reduce the ability of host governments to effectively regulate companies providing services.

Cross-border data flow requirements and restrictions on data localisation requirements

The WTO ecommerce proposals for cross-border data flows and restrictions on requirements to store data on local servers have a number of implications, below are just a few of them. Some countries prohibit certain data from leaving their country at all, while others allow it to leave their country as long as a copy is stored locally (eg see financial regulation and tax below).

Value of data

According to The Economist magazine, the world’s most valuable resource is no longer oil, but data.⁷¹ Others say that data is the new oil.⁷² For example:

- Facebook generated \$62.23 per US and Canadian user (\$7.29/Asia-Pacific user) in 2016.⁷³
- A gambling group’s most valuable asset, at \$1 billion, was the data it has on the 45million customers who had joined its customer-loyalty programme over the previous 17 years⁷⁴
- Payday loan applications that contained consumers’ Social Security numbers, account numbers, phone numbers, dates of birth and other personal information were sold for 50cents each to third party companies that used the data to commit fraud⁷⁵
- General information eg age, gender and location is worth \$0.50/1000 people⁷⁶

How much data is available on each person?

The US government’s Federal Trade Commission found that: ‘one data broker’s database has information on 1.4 billion consumer transactions and over 700 billion aggregated data elements; another data broker’s database covers one trillion dollars in consumer transactions; and yet another data broker adds three billion new records each month to its databases. Most importantly, data brokers hold a vast array of information on individual consumers. For example, one of the nine data brokers has 3000 data segments for nearly every U.S. consumer.’⁷⁷

Data brokers have categories ‘such as “Urban Scramble” and “Mobile Mixers,” both of which include a high concentration of Latinos and African Americans with low incomes. Other potentially sensitive categories highlight a consumer’s age such as “Rural Everlasting,” which includes single men and women over the age of 66 with “low educational attainment and low net worths,”’⁷⁸

Some concerning uses of big data

Big data is used in many ways, for example in machine learning (a type of artificial intelligence (AI)). Russian President Putin: whoever leads in AI will rule the world.⁷⁹ The type of AI involving machine learning (eg training it to identify cancer from scans etc) is based on data.⁸⁰ A few examples of concerning uses of big data are:

- 5% of patients account for almost half of health costs, so health insurance companies want to avoid insuring these sick people, or charge them more.⁸¹ Therefore, companies were gathering records from pharmacies and selling them to health insurers who could use the information to reject health insurance applications from those with pre-existing conditions or charge them more.⁸²
- A credit card company uses information that a couple is going through marriage counselling as a signal that marital discord may spill over into financial distress and lower their creditworthiness.⁸³ Without access to the algorithm or source code showing what are the reasons for the fall in credit scores or denial of credit, people cannot know why they were denied credit etc, see source code paper.
- The US government did a series of studies of the risks of big data including re privacy and discrimination in employment and access to credit etc, see Annex.

Reasons why governments may want to prevent cross-border data flows and require data to be stored locally

Governments have a number of reasons for requiring data to be stored locally. Some examples are provided below.

Privacy

Given the concerns noted above about how data is used and sold, a number of countries have strict privacy laws. The Australian government notes that Australian privacy law is harder to enforce if the cloud provider is based overseas.⁸⁴ Due to these privacy concerns, Australia's electronic health records system therefore requires that the data remain in Australia and be processed in Australia.⁸⁵ Kazakhstan requires all personal data collected within Kazakhstan be stored within the country.⁸⁶

Security

Snowden's leaked documents have shown that the U.S. government's National Security Agency (NSA) has among other activities sent an agent to a technology company's headquarters where they installed U.S. government software on to the company server and downloaded data from there for several weeks.^m This would be facilitated if the data is stored in the United States because of cross-border data flow requirements and prohibitions on requiring data to be stored locally are agreed to in any new WTO ecommerce rules.

A number of governments therefore have security concerns about sensitive data being held abroad. For example:

- South Korea greatly restricts the cross-border transfer of mapping data⁸⁷
- The USA requires all cloud computing service providers that work for the Department of Defense (DOD) to store DOD data within the USA.⁸⁸
- 'data is the most valuable resource for a nation today. It's as valuable as the natural resources that India is blessed with. For instance, would it be okay for Aadhaar's biometric data to be stored in a

^m <http://www.nytimes.com/2013/06/08/technology/tech-companies-bristling-concede-to-government-surveillance-efforts.html?pagewanted=all>

third country in an era where wars will no longer be fought with weapons but using tools of cyber warfare?ⁿ

Enforceable regulation generally

There are legal questions when the data is stored overseas, as noted above. For example: ‘Who governs the data stored abroad? Is it the law of the country in which data centre is located? Or the law of the country in which data centre provider is based? This legal issue of contracts that are perhaps subject to foreign courts can create huge problems for Indian companies in the event of a dispute.’^o

Tax records

The New Zealand government requires tax records stored on the cloud to be stored on a server in New Zealand and failure to do so is an offence punishable by a fine.⁸⁹ However, using cloud computing to backup business records will not breach record keeping obligations, provided the primary business records are stored in New Zealand.⁹⁰

Effective financial regulation

US financial regulators wanted to preserve their policy space to require financial data to be stored locally because they ‘are worried that if U.S. banks store their data in foreign countries, the regulators might not be able to get that data back into the United States for oversight purposes’.⁹¹ Then US Treasury Secretary Lew ‘explained that prudential regulators need to be guaranteed access to “timely and appropriate information” and there were times during the financial crisis they “were cut off.”’⁹² ‘Lew referenced the competing interests between preventing a non-tariff barriers and ensuring prudential regulators have access to information they need to supervise financial services firms active in the U.S.’⁹³ For example in the 2008 financial crisis, they needed to unwind positions held by Lehman Brothers when it collapsed but the data was held in Hong Kong and the IT systems had been switched off and the IT staff left, so this made it difficult for the US regulators to access the data needed.⁹⁴

The US Treasury has long opposed attempts to ban requirements to store financial services data locally.⁹⁵

Given the TPP’s restrictions on local data storage requirements, US financial regulators did not appear to think that the TPP’s prudential defence (copied from the WTO) would be sufficient to allow it to require financial data to be stored locally.⁹⁶ This is not surprising given that the GATS prudential defence has a self-cancelling 2nd sentence (‘Where such measures do not conform with the provisions of the Agreement, they shall not be used as a means of avoiding the Member’s commitments or obligations under the Agreement’),⁹⁷ which the European Union (EU) has also found problematic enough to delete in its FTAs.^p Therefore even if the GATS prudential defence applied to the proposed ban on requiring data to be stored locally, it is unlikely to be sufficient. (In the TPP, financial data has been explicitly excluded from the prohibition on requiring data to be stored locally in the TPP’s ecommerce chapter^q).

ⁿ <http://www.firstpost.com/business/sponsored-indian-cloud-data-centres-will-make-or-break-digital-india-2475598.html>

^o <http://www.firstpost.com/business/sponsored-indian-cloud-data-centres-will-make-or-break-digital-india-2475598.html>

^p Eg the Canada-EU FTA (CETA), http://trade.ec.europa.eu/doclib/docs/2016/february/tradoc_154329.pdf (Art 13.16.1 on p103) and Article 104 of the EU-CARIFORUM EPA (signed in 2008: <http://ec.europa.eu/trade/policy/countries-and-regions/regions/caribbean/>) <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:289:0003:1955:EN:PDF>

^q Art 14.1 TPP: definition of ‘covered person’ ‘does not include a “financial institution” or a “cross-border financial service supplier of a Party”’

Annex: some US government concerns re big data

The US government did a number of studies of the risks of big data and some of their findings are below. They found that big data is here to stay: ‘the technological trends of always-on networked devices, ubiquitous data collection, cheap storage, sensors, and computing power, will spur broader use of big data.’⁹⁸

‘Big data also introduces many quandaries. . . [big data] can also be used in ways that perpetrate social harms or render outcomes that have inequitable impacts, even when discrimination is not intended. Small biases have the potential to become cumulative, affecting a wide range of outcomes for certain disadvantaged groups. . . The big data revolution is in its earliest stages. We will be grappling for many years to understand the full sweep of its technologies; the ways it will empower health, education, and the economy; and, crucially, what its implications are for core American values, including privacy, fairness, non-discrimination, and self-determination.’⁹⁹

Discrimination, predatory practices, exacerbating inequalities

The Federal Trade Commission warned that the data currently being collected in categories which have been the basis for discrimination will be used for discrimination. ‘Some data brokers . . . sell marketing lists that identify consumers with specific health conditions, such as addictions and AIDS. The report also identifies marketing segments that focus on ethnicity, financial status, and health conditions. Examples of segments with apparent ethnic dimensions include “Metro Parents” (single parents who are “primarily high school or vocationally educated” and are handling the “stresses of urban life on a small budget”) and “Timeless Traditions” (immigrants who “speak[] some English, but generally prefer[] Spanish”). Nothing in the Commission’s report suggests that data brokers or their clients are running afoul of anti-discrimination laws. It is foreseeable, however, that data that closely follow categories that are not permissible grounds for treating consumers differently in a broad array of commercial transactions will be used in exactly this way.’¹⁰⁰

If big data ‘technologies are not implemented with care, they can also perpetuate, exacerbate, or mask harmful discrimination. . . there are great risks that the very same innovations could perpetuate discrimination and unequal access to opportunity as the use of data expands.’¹⁰¹

‘The era of big data is also full of risk. The algorithmic systems that turn data into information are not infallible—they rely on the imperfect inputs, logic, probability, and people who design them. Predictors of success can become barriers to entry; careful marketing can be rooted in stereotype. Without deliberate care, these innovations can easily hardwire discrimination, reinforce bias, and mask opportunity.’¹⁰²

Big data ‘raises considerable questions about how our framework for privacy protection applies in a big data ecosystem. Big data also raises other concerns. A significant finding of this report is that big data analytics have the potential to eclipse longstanding civil rights protections in how personal information is used in housing, credit, employment, health, education, and the marketplace.’¹⁰³

‘We upload messages and photos over social media to stay connected to our friends; our phones transmit our specific locations to transportation apps; and information about who we are and what we are interested in is collected by a wide variety of retail, advertising, and analytics companies. Supplying data to these services enables a greater degree of improvement and customization, but this sharing also creates opportunities for additional uses of our data that may be unexpected, invasive, or discriminatory. As data-driven services become increasingly ubiquitous, and as we come to depend on them more and more, we must address concerns about intentional or implicit biases that may emerge from both the data and the algorithms used as well as the impact they may have on the user and society.’

Questions of transparency arise when companies, institutions, and organizations use algorithmic systems and automated processes to inform decisions that affect our lives, such as whether or not we qualify for credit or employment opportunities, or which financial, employment and housing advertisements we see.’¹⁰⁴

‘We must pay ongoing and careful attention to ensure that the use of big data does not contribute to systematically disadvantaging certain groups. To avoid exacerbating biases by encoding them into technological systems, we need to develop a principle of “equal opportunity by design”—designing data systems that promote fairness and safeguard against discrimination from the first step of the engineering process and continuing throughout their lifespan.’¹⁰⁵

‘While this precise profiling of consumer attributes yields benefits, it also represents a powerful capacity on the part of the private sector to collect information and use that information to algorithmically profile an individual, possibly without the individual’s knowledge or consent. This application of big data technology, if used improperly, irresponsibly, or nefariously, could have significant ramifications for targeted individuals. . . Powerful algorithms can unlock value in the vast troves of information available to businesses, and can help empower consumers, but also raise the potential of encoding discrimination in automated decisions. . . While these scores may be generated for marketing purposes, they can also in practice be used similarly to regulated credit scores in ways that influence an individuals’ opportunities to find housing, forecast their job security, or estimate their health, outside of the protections of the Fair Credit Reporting Act or Equal Credit Opportunity Act.

Details on what types of data are included in these scores and the algorithms used for assigning attributes to an individual are held closely by companies and largely invisible to consumers. That means there is often no meaningful avenue for either identifying harms or holding any entity in the decision-making chain accountable. . . .

The steps taken by an algorithm are informed by the author’s knowledge, motives, biases, and desired outcomes. The output of an algorithm may not reveal any of those elements, nor may it reveal the probability of a mistaken outcome, arbitrary choice, or the degree of uncertainty in the judgment it produces. So-called “learning algorithms” which underpin everything from recommendation engines to content filters evolve with the datasets that run through them, assigning different weights to each variable. The final computer-generated product or decision—used for everything from predicting behavior to denying opportunity—can mask prejudices while maintaining a patina of scientific objectivity. . . .

For all of these reasons, the civil rights community is concerned that such algorithmic decisions raise the specter of “redlining” in the digital economy—the potential to discriminate against the most vulnerable classes of our society under the guise of neutral algorithms.

Recently, some offline retailers were found to be using an algorithm that generated different discounts for the same product to people based on where they believed the customer was located. While it may be that the price differences were driven by the lack of competition in certain neighborhoods, in practice, people in higher-income areas received higher discounts than people in lower-income areas. . . .

Just as neighborhoods can serve as a proxy for racial or ethnic identity, there are new worries that big data technologies could be used to “digitally redline” unwanted groups, either as customers, employees, tenants, or recipients of credit. A significant finding of this report is that big data could enable new forms of discrimination and predatory practices. . . .

Whether big data will build greater equality for all Americans or exacerbate existing inequalities depends entirely on how its technologies are applied in the years to come, what kinds of protections are present in the law, and how the law is enforced.’¹⁰⁶

‘The technologies of automated decision-making are opaque and largely inaccessible to the average person. Yet they are assuming increasing importance and being used in contexts related to individuals’ access to health, education, employment, credit, and goods and services. This combination of circumstances and technology raises difficult questions about how to ensure that discriminatory effects resulting from automated decision processes, whether intended or not, can be detected, measured, and redressed.’¹⁰⁷

‘a coalition of civil rights organizations announced a set of civil rights principles for the big data era, focused on stopping high-tech profiling, ensuring fairness in automated decisions, preserving

constitutional principles, enhancing individual control of personal information, and protecting people from inaccurate data.’¹⁰⁸

‘It is often assumed that big data techniques are unbiased because of the scale of the data and because the techniques are implemented through algorithmic systems. However, it is a mistake to assume they are objective simply because they are data-driven.

The challenges of promoting fairness and overcoming the discriminatory effects of data can be grouped into the following two categories:

- 1) Challenges relating to data used as inputs to an algorithm; and
- 2) Challenges related to the inner workings of the algorithm itself.’¹⁰⁹

Examples of 1):

- ignoring public transport options when calculating quickest route (even though it may be fastest, eg express train to the airport). Or
- out of date data or
- selection bias or
- ‘Unintentional perpetuation and promotion of historical biases, where a feedback loop causes bias in inputs or results of the past to replicate itself in the outputs of an algorithmic system. For instance, when companies emphasize “hiring for culture fit” in their employment practices, they may inadvertently perpetuate past hiring patterns if their current workplace culture is primarily based on a specific and narrow set of experiences. In a workplace populated primarily with young white men, for example, an algorithmic system designed primarily to hire for culture fit (without taking into account other hiring goals, such as diversity of experience and perspective) might disproportionately recommend hiring more white men because they score best on fitting in with the culture.’¹¹⁰
- ‘designers might select data that is of too much or too little granularity, resulting in potentially discriminatory effects’¹¹¹

‘Each of these issues is critical to take into account in designing systems to deliver services effectively, fairly, and ethically to consumers and community members, or to influence processes like credit-granting, hiring, housing allocation, and admissions. Transparency, accountability, and due process mechanisms are important components of ensuring that the inputs to an algorithmic system are accurate and appropriate.’¹¹²

Re 2) ‘The technical processes involved in algorithmic systems are typically unknown to a consumer, potential student, job candidate, defendant, or the public as they are often treated as confidential or proprietary to the entities that use them. . . This lack of transparency means that affected individuals—such as those who receive word that they will not receive a job offer, were denied admission to their college of choice, or will be denied a line of credit or lease—have limited ability to learn the reasons why such decisions were made and limited ability to detect and seek correction of any errors or bias if they do occur. It may even mean that certain individuals will be entirely excluded from certain opportunities—for instance, seeing particular advertisements for jobs, financial products, or educational opportunities and never discover that they were denied these opportunities. Such situations can be complex and difficult to address, especially if the outputs are relied upon again in subsequent determinations. At a minimum, it is important to encourage transparency, accountability, and due process mechanisms wherever possible in the use of big data. Without these safeguards, hard-to-detect flaws could proliferate. Such flaws include:

- Poorly designed matching systems, . . .
- Personalization and recommendation services that narrow instead of expand user options. . . Academic studies have shown that the algorithms used to recommend such content may inadvertently restrict the flow of information to certain groups, leaving them without the same opportunities for economic access and inclusion as others.
- Decision-making systems that assume correlation necessarily implies causation, whereby a programmer or the algorithmic system itself may assume that because two factors frequently

occur together (e.g., having a certain income level and being of a particular ethnicity), there is necessarily a causal relationship between the two. Assuming a causal relationship in these circumstances can lead to discrimination.

- Data sets that lack information or disproportionately represent certain populations, resulting in skewed algorithmic systems that effectively encode discrimination because of the flawed nature of the initial inputs. Data availability, access to technology, and participation in the digital ecosystem vary considerably, due to economic, linguistic, structural or socioeconomic barriers, among others. Unaddressed, this systemic flaw can reinforce existing patterns of discrimination by over-representing some populations and under representing others.

An additional area that presents challenges for further study is a genre of computer science known as machine learning—the “science of getting computers to act without being explicitly programmed.” Complex and often inscrutable even at times to their programmers, machine learning models are starting to be used in areas such as credit offers, entrepreneurial funding, or hiring. As these methods continue to advance, it may become more difficult to explain or account for the decisions machines make through this process unless mechanisms are built into their designs to ensure accountability. Using the principle of “equal opportunity by design” and grounding engineering with sound ethical and professional best practices will also help mitigate discriminatory results over time and increase inclusion.’¹¹³

Implications for access to credit

- ‘Consumers with less experience dealing with large institutions or complex data products may be particularly vulnerable to these data accuracy and transparency challenges . . . As algorithms develop to measure creditworthiness in new ways, it will be critical to design and test them with similar concerns in mind and to guard against unintentionally using information that is a proxy for race, gender, or other protected characteristics. . .
- When such decisions are made within computationally-driven 'black box' systems, traditional notions of transparency may fail to fully capture and disclose the information consumers need to understand the basis of such decisions and the role that various data played in determining their credit eligibility. . .
- The shortage of studies on these new scoring products is a potential cause for concern because of the complexity and proprietary nature of these new products. If poorly implemented, algorithmic systems that utilize new scoring products to connect targeted marketing of credit opportunities with individual credit determinations could produce discriminatory harms. This is particularly concerning because the rapid pace of evolution in the credit sector, especially combined with ongoing advances in data science, makes it difficult for researchers and consumers alike to identify discrimination and take steps to prevent it.’¹¹⁴

Implications for employment

‘Resume-database websites provided a place where individuals and companies could gain access to opportunities and talent. To deal with the sudden influx of candidates, companies looking to hire also turned to new ways of rating applicants, using analytical tools to automatically sort and identify the preferred candidates to move forward in a hiring process.

With this change, the task of identifying and scoring applicants began to shift from industrial psychologists and recruiting specialists to computer scientists, through the use of algorithms and large data sets. . . because they are built by humans and rely on imperfect data, these algorithmic systems may also be based on flawed judgments and assumptions that perpetuate bias as well. Because these technologies are new, rapidly changing, difficult to decipher, and often subject to proprietary protections, their determinations can be even more difficult to challenge. . .

Data-analytics companies are creating new kinds of “candidate scores” by using diverse and novel sources of information on job candidates. These sources, and the algorithms used to develop them, sometimes use factors that could closely align with race or other protected characteristics, or may be unreliable in predicting success of an individual at a job. For example, workers who were unemployed

for long periods during the recent economic downturn may have a harder time re-entering the workforce because candidate-scoring systems that consider “length of time since last job” can generate scores that send negative signals to potential employers that are unrelated to job performance.

Similarly, one employment research firm found commuting distance to be one of the strongest predictors of how long a customer service employee will stay with a job. If algorithmic systems were trained to rely heavily on this factor without further consideration, they could end up discriminating against the candidates who, while otherwise qualified, happen to live in areas that are further away from the job than other candidates. While the factor of commuting distance was ultimately disregarded in this particular study out of concern for how highly it might correlate with race, other employers might overlook such important factors. Other common hiring criteria, such as credit-worthiness (also the work of algorithms) and criminal records, compromise the validity of these tools if they inaccurately or inadequately reflect an individual’s qualifications. Implementation of such systems with an eye to their broader effects on fairness and equal opportunity is therefore essential.

Finally, as described earlier, machine-learning algorithms can help determine what kinds of employees are likely to be successful by reviewing the past performance of existing employees or by analyzing the preferences of hiring managers as shown by their past decisions. But if those sources themselves contain historical biases, the scores may well replicate those same biases. For example, if machine-learning algorithms emphasize the age that a candidate became interested in computing compared to their peers, cultural messages and assumptions that associate computing with boys more often than with girls could promote environments where more boys than girls are exposed to computers at an earlier age, thereby skewing later hiring patterns toward more male hires, even though a company’s hiring goals may be focused on gender equality. Similar concerns could emerge regarding age discrimination, since older workers may be less likely to have grown up with home computers. Further, hiring algorithms that emphasize the need for a four-year college degree, or even a particular field of study or degree can leave out highly qualified, talented individuals who might not have those specific qualifications and could instead come into the job opportunity through on-the-job training or emerging alternative training and apprenticeship models—or who might have a four-year degree but in a different field than the ones sought by the algorithmic systems. . . It is critical to the fairness of American workplaces that all companies continue to promote fairness and ethical approaches to the use of data tools and ensure against the perpetuation of biases that could disfavor certain groups.’¹¹⁵

Implications for education

‘In making admissions decisions, institutions of higher education may use big data techniques to try to predict the likelihood that an applicant will graduate before they ever set foot on campus. Using these types of data practices, some students could face barriers to admission because they are statistically less likely to graduate. Institutions could also deny students from low-income families, or other students who face unique challenges in graduating, the financial support that they deserve or need to afford college. This, in turn, creates a concern that as schools rush to cut costs, some applicants might face greater barriers to admission if they are considered unworthy of the extra resources it would take to keep them enrolled. One significant predictor of whether or not a student will graduate from college is family income, and the use of big data in this case may discriminate against students from lower-income families.’¹¹⁶

Implications for criminal justice

‘it is important that data and algorithmic systems not be used in ways that exacerbate unwarranted disparities in the criminal justice system. For example, unadjusted data could entrench rather than ameliorate documented racial disparities where they already exist, such as in traffic stops and drug arrest rates.

Those leading efforts to use data analytics to create and implement predictive tools must work hard to ensure that such algorithms are not dependent on factors that disproportionately single out particular communities based on characteristics such as race, religion, income level, education, or other data

inputs that may serve as proxies for characteristics with little or no bearing on an individual's likelihood of association with criminal activity. For instance, when historical information is used with predictive algorithms to direct patrols, prior arrest data could be used to advise beat officers to patrol certain areas with greater frequency or intensity. If feedback loops are not thoughtfully constructed, a predictive algorithmic system built in this manner could perpetuate policing practices that are not sufficiently attuned to community needs and potentially impede efforts to improve community trust and safety. For example, machine learning systems that take into account past arrests could indicate that certain communities require more policing and oversight, when in fact the communities may be changing for the better over time.

Moving forward, law enforcement agencies could work to account for these issues: transparency and accountability on data input and processes, a focus on eliminating data that could serve as proxies for race or poverty, and ensuring that bias is not replicated through these tools are key steps.¹¹⁷

Privacy

‘Signals from home WiFi networks reveal how many people are in a room and where they are seated. Power consumption data collected from demand-response systems show when you move about your house. . . This trend toward ubiquitous collection is in part driven by the nature of technology itself. Whether born analog or digital, data is being reused and combined with other data in ways never before thought possible, including for uses that go beyond the intent motivating initial collection. The potential future value of data is driving a digital land grab, shifting the priorities of organizations to collect and harness as much data as possible. Companies are now constantly looking at what kind of data they have and what data they need in order to maximize their market position. In a world where the cost of data storage has plummeted and future innovation remains unpredictable, the logic of collecting as much data as possible is strong.

Another reality of big data is that once data is collected, it can be very difficult to keep anonymous. While there are promising research efforts underway to obscure personally identifiable information within large data sets, far more advanced efforts are presently in use to re-identify seemingly “anonymous” data. Collective investment in the capability to fuse data is many times greater than investment in technologies that will enhance privacy.

Together, these trends may require us to look closely at the notice and consent framework that has been a central pillar of how privacy practices have been organized for more than four decades. In a technological context of structural over-collection, in which re-identification is becoming more powerful than de-identification, focusing on controlling the collection and retention of personal data, while important, may no longer be sufficient to protect personal privacy. In the words of the President's Council of Advisors for Science & Technology, “The notice and consent is defeated by exactly the positive benefits that big data enables: new, non-obvious, unexpectedly powerful uses of data.”¹¹⁸

‘we live in a world where data collection is nearly ubiquitous, where data retention can be functionally permanent, and where data analysis is increasingly conducted in speeds approaching real time. While there are promising technological means to better protect privacy in a big data world, the report's authors concluded these methods are far from perfect, and technology alone cannot protect privacy absent strong social norms and a responsive policy and legal framework.’¹¹⁹

Privacy, the US President said, “has been at the heart of our democracy from its inception, and we need it now more than ever.” This is even truer in a world powered by big data.¹²⁰

The Working Group recommended strengthening privacy protections in various ways, including for non-US citizens.¹²¹

Furthermore, for students, President Obama said that “[D]ata collected on students in the classroom should only be used for educational purposes— to teach our children, not to market to our children. We want to prevent companies from selling student data to third parties for purposes other than education. We want to prevent any kind of profiling that puts certain students at a disadvantage as they go through school.”¹²² So the proposed new Student Digital Privacy Act is based on Californian

law that would prevent companies from selling student data to third parties for purposes unrelated to the educational mission and from engaging in targeted advertising to students based on data collected in school.¹²³

¹ WT/L/274 from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx.

² WT/MIN(17)/15 from https://www.wto.org/english/thewto_e/minist_e/mc11_e/documents_e.htm

³ WT/L/579 from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx

⁴ Para 4B20 JOB/GC/97.Rev.3

⁵ New Zealand Ministry of Foreign Affairs and Trade, Trans-Pacific Partnership, *Text of the Trans-Pacific Partnership*, Article 9.10 <http://tpp.mfat.govt.nz/tpp-text.php>

⁶ OECD, Topics, Multilateral Agreement on Investment <http://www.oecd.org/investment/internationalinvestmentagreements/multilateralagreementoninvestment.htm> in particular, Unclassified DAF/MAI(98)7/REV1, 22 April 1998, *Negotiating Group on the Multilateral Agreement on Investment (MAI) The Multilateral Agreement on Investment, Draft Consolidated text*, <http://www1.oecd.org/daf/mai/pdf/ng/ng987r1e.pdf>

⁷ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>

⁸ Annex F of WTO document WT/MIN(05)/DEC from

https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx

⁹ WTO document G/L/589, 8 November 2002, *Report (2002) of the Committee on Trade-Related Investment measures*, from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx

¹⁰ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>

¹¹ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>

¹² UNCTAD, Proceedings of the Expert Meeting held in Geneva from 6 to 8 November 2002, *The Development dimension of FDI: Policy and Rule-Making Perspectives*, UNCTAD/ITE/IIA/2003/4, http://unctad.org/en/Docs/iteia20034_en.pdf

¹³ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>

¹⁴ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>

¹⁵ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>

¹⁶ Screen Australia, about us <http://www.screenaustralia.gov.au/about-us/who-we-are>

¹⁷ Film Finance Corporation of Australia, August 2001, *Protecting Australian audiovisual products in free trade negotiations*, http://screenaustralia.com.au/ffc/newsletter/newsletter_300901/ffc_int_newsletter_policy.asp

¹⁸ AFC/FFC December 1999, *Response to the productivity commission draft report, Review of Broadcasting Legislation*, http://afcarchive.screenaustralia.gov.au/downloads/policies/prod%20comm_response.pdf

¹⁹ Dr. Brian Yecies, University of Wollongong, Australia, *Interfacing Transnational Cultural flows and the Rising Korean Cinematiger*, http://congress.aks.ac.kr/korean/files/2_1358386613.pdf

²⁰ No! FTA, Korean Alliance against KorUS FTA, *The REAL understanding of the KorUS FTA*,

http://kctu.org/?module=file&act=procFileDownload&file_srl=23797&sid=1543ca4e50830170ab680c38ebc4b171

²¹ CRS, Report for Congress, Order Code RL33435, William H. Cooper, Mark E. Manyin, Updated July 18, 2007, *The Proposed South Korea-U.S. Free Trade Agreement (KORUS FTA)* <https://www.fas.org/sgp/crs/row/RL33435.pdf>

²² Executive Office of the President of the United States, Amb Michael B.G. Froman, *2016 National Trade Estimate Report on Foreign Trade Barriers*, <https://ustr.gov/sites/default/files/2016-NTE-Report-FINAL.pdf>

²³ NZherald.co.nz, Eugène Bingham, June 30, 2000, *Spectre of trade wrangle over TV quota*, http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=131365

²⁴ Para 2.8 JOB/GC/94 (and perhaps para 2.13 of JOB/GC/94 and 4C of JOB/GC/100, but it is unclear what these mean)

²⁵ Article X.3.1d) <http://bilaterals.org/?tisa-draft-annex-on-localization>

²⁶ Article 9.10.1h <http://www.tpp.mfat.govt.nz/text>

- ²⁷ 2012 U.S. Model Bilateral Investment Treaty, Treaty between the Government of the United States of America and the Government of [Country] concerning the encouragement and reciprocal protection of investment, <https://ustr.gov/sites/default/files/BIT%20text%20for%20ACIEP%20Meeting.pdf>
- ²⁸ UNCTAD 2003, *Foreign direct investment and performance requirements: New evidence from selected countries*, UNCTAD/ITE/IIA/2003/7 http://unctad.org/en/docs/iteiia20037_en.pdf
- ²⁹ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>
- ³⁰ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>
- ³¹ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>
- ³² See for example, GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>
- ³³ Act, The App Association, *Mobile Mythbusting : WIFI, WAPI, and the Encryption Debate*, <http://actonline.org/2016/03/17/mobile-mythbusting-wifi-wapi-and-the-encryption-debate/>. See also c/net, Michael Kanellos, March 10, 2004, *Intel, others to stop shipping Wi-Fi to China*, <http://www.cnet.com/news/intel-others-to-stop-shipping-wi-fi-to-china/>.
- ³⁴ Para 2.6 JOB/GC/94
- ³⁵ New Zealand Ministry of Foreign Affairs and Trade, Trans-Pacific Partnership, *Text of the Trans-Pacific Partnership*, Article 9.10.1f) <http://www.tpp.mfat.govt.nz/text>
- ³⁶ 2012 U.S. Model Bilateral Investment Treaty, Treaty between the Government of the United States of America and the Government of [Country] concerning the encouragement and reciprocal protection of investment, Article 8.1f) <http://www.ustr.gov/sites/default/files/BIT%20text%20for%20ACIEP%20Meeting.pdf>
- ³⁷ UNCTAD 2003, *Foreign direct investment and performance requirements : New evidence from selected countries*, UNCTAD/ITE/IIA/2003/7, http://unctad.org/en/Docs/iteiia20037_en.pdf
- ³⁸ The European Journal of Development Research, Vol.16, No.3, Autumn 2004, pp.687–715, Ha-Joon Chang, *Regulation of Foreign Investment in Historical Perspective*, http://law.wisc.edu/gls/documents/foreign_investment1.pdf
- ³⁹ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>
- ⁴⁰ Oxfam International, Watkins Kevin and Fowler Penny, 01 May 2002, *Rigged Rules and Double Standards: Trade, globalization and the fight against poverty*, <http://policy-practice.oxfam.org.uk/publications/rigged-rules-and-double-standards-trade-globalisation-and-the-fight-against-pov-112391>
- ⁴¹ Myers, Ramon H. “The Economic Transformation of the Republic of China on Taiwan.” *The China Quarterly*, No. 99 (Sept. 1984): 517.
- ⁴² *Virtual Institute Teaching Material on Transfer of Technology*, UNCTAD/GDS/2011/4 from <http://unctad.org>.
- ⁴³ *Virtual Institute Teaching Material on Transfer of Technology*, UNCTAD/GDS/2011/4 from <http://unctad.org>.
- ⁴⁴ GIZ, Lise Johnson, July 2016, *Space for Local Content Policies and Strategies – A crucial time to revisit an old debate*, <https://www.giz.de/expertise/downloads/giz2016-en-local-content-policies-study.pdf>
- ⁴⁵ JOB/GC/97/Rev.3 para 4B20.
- ⁴⁶ <http://bilaterals.org/IMG/pdf/localization.pdf> Article X.1.
- ⁴⁷ Article 10.6, <http://www.tpp.mfat.govt.nz/text>
- ⁴⁸ UNCTAD 2005, UNCTAD Series on International Investment Policies for Development, *International Investment Agreements in Services*, UNCTAD/ITE/IIT/2005/2 http://unctad.org/en/Docs/iteiit20052_en.pdf
- ⁴⁹ UNCTAD, World Investment Report 2004, *The Shift Towards Services* http://unctad.org/en/Docs/wir2004ch6_en.pdf
- ⁵⁰ UNCTAD 2007, *Global Players from emerging Markets: Strengthening enterprise competitiveness through outward investment*, UNCTAD/ITE/TEB/2006/9 http://unctad.org/en/Docs/iteteb20069_en.pdf
- ⁵¹ WTO document S/FIN/W/74, *Impact of Technological Developments on regulatory and compliance aspects of Banking and other Financial Services under the GATS*, from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx
- ⁵² UNCTAD 2005, UNCTAD Series on International Investment Policies for Development, *International Investment Agreements in Services*, UNCTAD/ITE/IIT/2005/2 http://unctad.org/en/Docs/iteiit20052_en.pdf
- ⁵³ *Conflict of Laws and International Finance* (The Law and Practice of International Finance, Vol. 6) (v. 6) Jul 31, 2007 by Philip R. Wood
- ⁵⁴ Eg European Commission, Trade, Trade in Services Agreement (TiSA) <http://ec.europa.eu/trade/policy/in-focus/tisa/>

- ⁵⁵ Article X.7 in the June 2016 version, WikiLeaks, document dated 27 June 2016, *TiSA Annex on Financial Services*, https://wikileaks.org/tisa/document/20160627_TiSA_Annex-on-Financial-Services/.
- ⁵⁶ Eg see BIS Quarterly review, December 2012, Sebastian von Dahlen and Goetz von Peter, *Natural catastrophes and global reinsurance - exploring the linkages*, http://www.bis.org/publ/qtrpdf/r_qt1212e.pdf
- ⁵⁷ WTO document S/FIN/W/74, *Impact of Technological Developments on regulatory and compliance aspects of Banking and other Financial Services under the GATS*, from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S001.aspx
- ⁵⁸ IMF, April 16, 2010, *Cross-Cutting Themes in Economies with Large Banking Systems*, <https://www.imf.org/external/np/pp/eng/2010/041610.pdf>
- ⁵⁹ IMF, June 2014, *Cross-Border Bank Resolution: Recent Developments*, <https://www.imf.org/external/np/pp/eng/2014/060214.pdf>
- ⁶⁰ IMF, April 16, 2010, *Cross-Cutting Themes in Economies with Large Banking Systems*, <https://www.imf.org/external/np/pp/eng/2010/041610.pdf>
- ⁶¹ Arthur L. Centoze, Pace University, Spring/Summer 2011, Case Study, *Iceland's Financial Meltdown*, <https://activityinsight.pace.edu/acentonze/intellcont/FIN644%20-%20Iceland's%20Financial%20Meltdown%20%28Case%29-1.pdf>
- ⁶² IMF, April 16, 2010, *Cross-Cutting Themes in Economies with Large Banking Systems*, <https://www.imf.org/external/np/pp/eng/2010/041610.pdf>
- ⁶³ Annex on Financial Services, para 2a).
- ⁶⁴ Eg see Public Citizen's Global Trade Watch, Ben Beachy, July 2, 2015, *TISA Leak Reveals 10 Key Threats to Commonsense Financial Regulations*, <https://wikileaks.org/tisa/financial/04-2015/analysis/Analysis-TiSA-Financial-Services-Annex.pdf>
- ⁶⁵ TISA Annex on Electronic Commerce: *A preliminary analysis by the Canadian Internet Policy & Public Interest Clinic (CIPPIC)*, Tamir Israel, <https://wikileaks.org/tisa/ecommerce/analysis/Analysis-TiSA-Electronic-Commerce-Annex.pdf>
- ⁶⁶ http://www.bakermckenzie.com/files/Uploads/Documents/North%20America/DoingBusinessGuide/Houston/bk_internationallabor_12.pdf
- ⁶⁷ University of Chicago Law School, Chicago Unbound, Occasional Papers, No.40, Jack L. Goldsmith, 1999, *Against Cyberanarchy*, http://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1001&context=occasional_papers
- ⁶⁸ Digital Commons @ LMU and LLS, Law Reviews, 6-1-2003, Bruce Zagaris, *U.S. Efforts to Extradite Persons for Tax Offenses*, <http://digitalcommons.lmu.edu/ilr/vol25/iss3/9/>
- ⁶⁹ Bochetto & Lentz, P.C. *Criminal fraud vs civil fraud: What's the difference?* <http://bochettoandlentz.com/criminal-fraud-vs-civil-fraud-whats-difference/>
- ⁷⁰ University of Chicago Law School, Chicago Unbound, Occasional Papers, No.40, Jack L. Goldsmith, 1999, *Against Cyberanarchy*, http://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1001&context=occasional_papers
- ⁷¹ <https://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worlds-most-valuable-resource>
- ⁷² For example <http://www.cbc.ca/news/technology/data-is-the-new-oil-1.4259677>, <https://www.wired.com/insights/2014/07/data-new-oil-digital-economy/>, <https://www.forbes.com/sites/perryrotella/2012/04/02/is-data-the-new-oil/#2140fb087db3>
- ⁷³ <http://uk.businessinsider.com/facebook-almost-20-per-user-us-and-canada-q4-2017-2>
- ⁷⁴ <https://www.economist.com/news/briefing/21721634-how-it-shaping-up-data-giving-rise-new-economy>
- ⁷⁵ <http://www.miamiherald.com/news/nation-world/national/article30876663.html>
- ⁷⁶ <http://ig.ft.com/how-much-is-your-personal-data-worth/#axzz2uwymG8O>
- ⁷⁷ <https://www.ftc.gov/system/files/documents/reports/data-brokers-call-transparency-accountability-report-federal-trade-commission-may-2014/140527databrokerreport.pdf>
- ⁷⁸ <https://www.ftc.gov/system/files/documents/reports/data-brokers-call-transparency-accountability-report-federal-trade-commission-may-2014/140527databrokerreport.pdf>
- ⁷⁹ <http://edition.cnn.com/2017/09/05/opinions/russia-weaponize-ai-opinion-allen/index.html>
- ⁸⁰ Eg <https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/#300f712a2742>
- ⁸¹ 'The Black Box Society: the secret algorithms that control money and information', Frank Pasquale, Harvard University Press, 2015
- ⁸² 'The Black Box Society: the secret algorithms that control money and information', Frank Pasquale, Harvard University Press, 2015
- ⁸³ 'The Black Box Society: the secret algorithms that control money and information', Frank Pasquale, Harvard University Press, 2015

84 <https://www.communications.gov.au/sites/g/files/net301/f/2014-112101-CLOUD-Consumer-factsheet.pdf>
85 <http://www.macleans.ca/uncategorized/trade-agreements-privacy-and-the-cloud/> and
<https://www.itic.org/public-policy/SnapshotofDataLocalizationMeasures1-19-2017.pdf>
86 <https://www.itic.org/public-policy/SnapshotofDataLocalizationMeasures1-19-2017.pdf>
87 <https://www.itic.org/public-policy/SnapshotofDataLocalizationMeasures1-19-2017.pdf>
88 <https://www.itic.org/public-policy/SnapshotofDataLocalizationMeasures1-19-2017.pdf>
89 <http://www.ird.govt.nz/technical-tax/revenue-alerts/revenue-alert-ra1002.html>
90 <http://www.ird.govt.nz/technical-tax/revenue-alerts/revenue-alert-ra1002.html>
91 <http://www.politico.com/tipsheets/morning-trade/2016/02/lew-defends-financial-services-data-carveout-senate-to-vote-on-customs-bill-democrats-weigh-in-on-tp-212657>
92 <https://www.sifma.org/resources/general/hfsc-on-international-financial-system-with-sec-lew/>
93 <https://www.sifma.org/resources/general/hfsc-on-international-financial-system-with-sec-lew/>
94 http://www2.itif.org/2016-financial-data-trade-deals.pdf?mc_cid=0a36b6ab0c&mc_eid=671b585ee6
95 Inside US Trade, 'Financial Services Firms Fight TPP Data Flow Rules, Backed By House GOP', posted: November 19, 2015
96 <https://www.fas.org/spp/crs/misc/R44354.pdf>
97 https://www.wto.org/english/docs_e/legal_e/26-gats_02_e.htm#annfin
98 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
99 https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf
100 <https://www.ftc.gov/system/files/documents/reports/data-brokers-call-transparency-accountability-report-federal-trade-commission-may-2014/140527databrokerreport.pdf>
101 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
102 <https://obamawhitehouse.archives.gov/blog/2016/05/04/big-risks-big-opportunities-intersection-big-data-and-civil-rights>
103 https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf
104 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
105 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
106 https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf
107 https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf
108 https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf
109 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
110 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
111 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
112 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
113 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
114 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
115 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
116 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
117 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504_data_discrimination.pdf
118 https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf
119 https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf
120 https://obamawhitehouse.archives.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf
121 https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf
122 https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf
123 https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf