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Why We Need a Second Bretton Woods Gathering

We need a new system of rules for the digital 21st century that enhances global digital cooperation and welfare. Nothing less than a historic gathering of the world's key decision makers will get us there.

Editor's note: The following are remarks by INET co-founder Jim Baillie prepared for his keynote presentation at the IMF's "Measuring Economic Welfare in the Digital Age: What and How?" forum in Washington, D.C. on November 20, 2018. To follow along with the corresponding presentation, please refer to the PowerPoint on this page.

By Jim Balsillie

Madame Lagarde, distinguished experts from IMF & beyond, conference attendees, members of media:

It's my pleasure to share my ideas with you on the socio-economic implications of digitization for welfare. I reviewed the online material from previous forums and attended all of this year's sessions where many of you are working to address the challenge of measuring the digital economy, illuminated by the fact that digital consumption over the past 20+ years has grown at an explosive rate that far exceeds reported GDP growth rates. I commend you for your excellent research and look forward to seeing it manifest in policies that advance all of our economies.

On its centenary, I would also like to give a special nod to Statistics Canada, represented here by Chief Statistician Anil Arora, which started life in 1918 as the Dominion Bureau of Statistics, for its 100 years of trusted, exceptional work including adapting how Canada measures our own digital economy. Measurement is the indispensable handmaiden of theory; never has this been as true and relevant as today.

The digital economy is growing exponentially in multiple complementary dimensions: processor speeds, memory capacity, fixed & mobile broadband for both adoption & bit rates, ecommerce activity, sharing economy, IoT units installed, and data generated. The mutually reinforcing effects of these innovations are resulting in a turbocharged transformation of the global economy, societies, and the way we govern ourselves. The production economy of the 20th century created rising tides that lifted all boats. But today, data is everywhere but in economic accounts and it is not

currently governed in a manner that lifts many, let alone all boats. This puts massive strain on economic policies and has major implications for societies across the globe. It's why I'll argue today that we need a second Bretton Woods moment that fully incorporates this digital age in a strategy to promote international stability, cooperation and sustainable growth.

Challenges of Big Data, AI and ML *(slide 2)*

Big data, artificial intelligence and machine-learning are revolutionary in two fundamental ways. First, they industrialize and accelerate the very act of learning. Second, they allow learning to access and mobilize information beyond the reach of the human mind. They create a veritable technological sixth sense.

These new capabilities, applied with industrial strength, are starting to open up revolutionary new potential in virtually every sector of the economy, including: food & agriculture, healthcare, financial services, retail & commerce, education & research, transportation, government services, and more.

But along with the potential economic benefits, these same capabilities also confront policymakers with equally profound challenges: 1. the implications of "winner take all" economics and emergence of a new factor of production – machine knowledge capital – for market frameworks; 2. the implications of increased concentration of wealth for distributional equity and the integrity of democratic process; 3. new risks to national security; and 4. the unleashing of new strategic rivalries in geopolitics.

The digital transformation has the potential to be both panacea and Pandora's Box. As a wise person once told me, "*Internet is a paradise for consumers and hell for citizens."* As a capitalist and an optimist I believe in the ability of the market economy to unleash the power of human ingenuity to drive innovation that enhances the quality of life for of all mankind. Technology has been a force for good for decades and it still has potential to continue on that path. However, the pervasive information asymmetries of the data-driven economy are a real threat to market competition and to our democratic systems of governance. So for today, I will first talk about the transformations driven by the new digital dynamic and then share with you some thoughts for measurement and policy.

Shift from Tangibles to Intangibles ***(slide 3)***

Over the past three decades, a new global rule-of-law framework has been forged to govern the way that innovation is incentivized and the way that gains from innovation are captured and distributed. This new global economic framework is based on the internationalization of increased protection of intellectual property rights (IPR).

The development of this framework was motivated in the first instance by the rise of the knowledge-based economy (KBE), in which the strategic focus of business shifted to generating and controlling traditional IP assets, such as patents and copyrights. The framework has been further elaborated to reflect the emergence of the data-driven economy (DDE), in which the strategic focus of business has shifted increasingly to generating and controlling data assets as well as the valuable intellectual property developed on these data assets through application of artificial intelligence and machine learning (AI/ML).

Today, IP and data are the world's most valuable business and national security assets. In 1976, 16% of the value of the S&P500 was intangibles. Today, intangibles comprise almost 90% of the S&P500 total value. To give you a sense of scale, the world's five most-valuable data-driven companies are worth well over $4 trillion together, but their balance sheets report only $225 billion of tangible assets, or just over 5% of their total value. The vast majority of their market value is comprised of IP and data. Not bricks and mortar or even machines. According to the U.S. Chamber of Commerce, IP and data intensive industries already contribute almost $7 trillion annually to the US economy. But as we know from current accounting of these impressive growth figures, this rising tide lifts mostly a few yachts.

The pace of this shift is accelerating, as evidenced by the rapid rise in IP filings in the past couple decades shown in the two charts on this slide. A recent US National Bureau of Economic Research (NBER) report states: "*Patents are the most concrete and comparable measure of innovative output over countries and time*." They have a direct impact on wealth and power at both firm level and nationally, which is why smart innovation countries focus on owning and protecting these assets.

With the digital transformation, this accumulation of intangible assets is about to be turbocharged by a big data tsunami sourced from a vast array of sensors that form the Internet of Things. IBM recently estimated that 90% of all the world's data had been created in the previous two years. Juniper Research estimates that the number of connected devices will triple to 46 billion by 2021.

The scale of this shift in the source of market value recalls the shift in the source of wealth from land to capital that started with the industrial revolution and marked the transition from the feudal to the capitalist system. While equally profound in terms of its implications for the organization and governance of economy and society, the current shift is unprecedented in terms of its rapidity.

Intangibles Economy is Different than the Tangibles Economy *(slide 4)*

The tangibles and intangibles economies are fundamentally different in many ways. In the production-based industrial economy of tangibles, the ability to produce efficiently at scale and to sell at lower prices enables the capture of markets, which underpins profitability. In the traditional economy, trade agreements open up foreign markets to gain greater access to production economies of scale. Competition naturally emerges from the removal of restrictions on commerce. Efficiency is based on optimization of value chains on a global scale. The win-win dynamics of trade spread the benefits. The instruments designed to govern this international economy are properly called "*Free Trade Agreements*" and we currently have solid measurement tools to track their socio and economic impacts.

But the intangibles economy is based on amassing rent-generating assets. Digital products based on IP and data have effectively *zero* marginal production costs, which results in "winner take all" economics. Market opening thus drives concentration, not competition. The instruments designed to govern this type of global economy focus on the *protection* of IP and data assets.

The main thrust of the so-called 21st century trade agreements – including the original TPP, CETA, and the USMCA – has been to entrench and expand protection for intangible assets. Protection of intangible assets is also the main bone of contention in the current trade war between the United States and China.

With the shift from the tangibles economy to the intangibles economy, protection becomes the new liberalization. As the economist Dan Ciuriak has suggested, trade agreements are now more appropriately called *"Asset Value Protection Agreements."*

Data-Driven Economy Mandala Schematic (*slide 5*)

As part of this fundamental shift, we've come to depend on the vast network of internet and telecommunications infrastructure developed to allow for the open and rapid exchange of information and services. Big Data assembled from ubiquitous sensors, coupled with ever more powerful AI and machine-learning engines, and deployed through next generation 5G networks, will transform this from passive infrastructure into a veritable digital nervous system.

And this is why I argue that data governance is the most important public policy issue of our time. Whoever controls the data, controls who and what interacts with it. Furthermore, *any* data collected can be reprocessed and analysed in new ways in the future that are unanticipated at the time of collection and this has major implications for the global economy and for democracy.

It is essential to look at data governance as an integrated whole, because the exploitation of data generates a new feedback that modifies the behavior of the society and economy that generated the data in the first place.

This slide is a mandala schematic representation of how I think strategically about the cross-cutting issues that the digital transformation raises. It is about values, the distribution of wealth, preserving competitive markets, preserving privacy, maintaining the integrity of democratic process, and, very importantly, ensuring national security.

I would argue it is even more urgent as a policy challenge than climate change because abuse of data compromises the very democratic processes on which we rely to intelligently and effectively address challenges like climate change. We already know that Facebook's algorithms played a central role in creating the genocide in Myanmar. Quantitative social psychology that leveraged social media information was used to influence outcomes from Kenya's election to Brexit to Trump's presidential campaign. Who will be next? So tailored national strategies are of the highest priority, which I'll discuss in a couple of minutes.

Cyber Dimension of Complexity (*slide 6*)

The internet was not originally designed with security in mind. Moreover, with all the innovation and the rapid expansion of our digital economy and society, we are creating new vulnerabilities faster than we are finding remedies for old ones. The billions of new and potentially unsecured network nodes in the internet of things that are now being installed create an ever-expanding zone for cyber threat actors to exploit.

This slide is my effort to concisely lay out the primary dimensions of complexity that cyber security presents. The targets of cyber-attacks are both strategic public sector assets including military systems, and private assets such as technology and trade secrets, or energy and banking systems. And sometimes there are almost random denial of service attacks unleashed by hackers playing online games. This realm is much more covert than the traditional overtness of engagement. Technology levels the playing field for parties with asymmetrical physical assets. There are challenges in establishing the responsible agents because of the remoteness of a cyber-attack.

Altogether this is a wickedly complex issue with no complete solution on the horizon. What is clear is that the security and economic realms are now completely melded in digital space, so it is existential for a modern nation-state to have sufficient sovereign capacity and resilience to manage and contain these cyber threats.

Security will always trump economics – and in the cyber realm it will be difficult to dismiss precautionary measures because of the complexity and lack of transparency. Many consider the US national security duties on imports of steel and aluminum from its allies to be risible precisely because it is possible to do the math. Not so with cyber security. I will come back to this point in discussing the overall policy architecture for the digital transformation.

I end the discussion of the present point with the observation that nation-states are increasingly migrating from primarily surveillance towards cyber warfare. And precisely because of the complexity and lack of transparency, there are growing risks of this getting out of control, which would have profound negative impacts on the global economy and welfare.

Geopolitics of Data Governance (*slide 7*)

The data-driven economy is an unprecedented economic and societal force that is revolutionizing nearly every industry and leading to new power dynamics between countries. Data capital stocks create critical new issues regarding ownership of data and national regulations for the data-driven economy. This is not a parochial or xenophobic instinct. It is simply a result of the fact that data ownership is akin to land ownership in feudal times: it makes those who control the data permanently wealthy and powerful, and leaves those who supply data at the owner's mercy. This is very different from a production economy where there is an exchange of products based on comparative cost advantage and where global cooperation is of benefit to all parties.

Because of its distinct properties, the data-driven economy has created rivalrous systems between China, the US and the EU. Each of these three economic regions is creating distinct and fundamentally divergent strategies consisting of rules, regulations and international agreements that embed their norms, advantage their own economies, and advance their broader geostrategic interests. The Chinese quote on this slide is a good example of their deliberate and systemic approach to managing digital transformation.

China has its great firewall and aggressively supports national champions like Baidu, Tencent and Alibaba. The US aggressively pushes for open data flows that support Silicon Valley superstar firms. Because Europe does not have large pre-existing data-driven companies, it takes a more defensive approach by focusing on data standards and regulation, such as GDPR (General Data Protection Regulations) and competition policy. But it too is now looking to go on offense, building on its 'Digital Single Market' policy.

These three approaches beg important questions such as: how do we address the incompatibilities in these strategies; and, what should be the strategies of the rest of the world? National industrial and security strategy is very different when you are the home country of some of these successful national champions rather than being just a customer state. Compelling strategies for the small open economy and for the developing economy have yet to be set out.

Strategic Technologies and AI Nationalism (*slide 8*)

There is a global race underway by large firms and nation-states to own critical IP, especially for key emerging areas such as block chain, AI and machine learning. Last year, for the first time, China received more patent applications than the US, the EU, Japan and South Korea combined.

In advanced policy circles, the competition to dominate AI has been characterized as "AI Nationalism" or 'techno-nationalism'. Machine learning is a general-purpose technology that will affect all sectors and parts of society. It leads to the winners gaining enormously enhanced economic, technological and military powers. You cannot patent data but you can patent around it and block access – even when the data is shared.

We are already witnessing protectionist state actions playing out in real time as part of this new geopolitical race:

- The US blocked the Broadcom takeover of chipmaker Qualcomm and in response the Chinese blocked the Qualcomm takeover of chipmaker NXP.
- The EU created a new screening framework for foreign investment alongside France, UK, Italy and Germany creating new rules for how they govern foreign investment, especially focused on valuable AI and data assets.
- President Trump has cited China's ambitions in technology as a justification for imposing tariffs on Chinese goods, and the US Congress approved new sweeping powers for the Committee on Foreign Investment partially to target minority stakes taken by Chinese venture capital funds active in Silicon Valley.

So policies for the knowledge-based and data-driven economies must be properly integrated for the benefit of every country's security and sovereignty. This also includes inward foreign direct investment (FDI) policies and strategies.

Dan Ciuriak chart on FDI (*slide 9*)

Traditional FDI into a country's industrial base means capital and technology inflows. Foreign branch plants secure global production mandates for exports that create good jobs and also provide positive knowledge spillovers to the host economy. We know how to measure traditional FDI using existing tools and models.

But FDI into the innovation economy is extractive. It's difficult to capture the exact effect of these transfers because it focuses so much on emerging potential. This distinction is best summarized by economist Dan Ciuriak in his recent paper 'Rethinking Industrial Policy for the Data-Driven Economy' where he writes: "*In the knowledge-based and data-driven economy, FDI comes mainly through mergers and acquisitions (M&A) and targets knowledge assets – patent portfolios, promising start-ups, or knowledge benefits from participating in research-intensive hubs.*" He further observes that where trade liberalization takes out the least productive firms: "*In the KBE, FDI of the M&A type tends to target the most promising, fastest growing firms with the potential to become "gazelles".* The host economy is left with the "mediocre middle".

Foreign branch plants in the innovation economy do not create new jobs in zero-unemployment STEM areas, which is why we have a global contest to capture tech talent. Foreign tech branch plants poach scarce talent and often expatriate key personnel abroad, reducing local knowledge spillovers in the host economy. And they exfiltrate the most valuable intangible assets, as IP is assigned to headquarters abroad and data flows to established data centers. This creates the need for a new public policy filter for screening inward FDI for the IP and data-driven realities to measure the net benefit to the host economy.

Machine Learning Capital and the Future of Work (*slide 10*)

As advanced machine-learning algorithms effectively mine these enormous and rapidly growing stocks and flows of data, we are seeing the emergence of a new factor of production – machine learning capital – and a new mode of innovation – machine-generated IP. This has profound impacts on how we measure the digital economy.

Machine learning capital competes with and complements human capital the way robots compete with and complement unskilled labour. With the extra catch: its replicator economics can collapse the value of traditional forms of human capital.

While some skilled workers will see their returns enhanced as they are empowered by complementary forms of AI, the total wage bill flowing to skilled workers seems almost certain to fall as wages are displaced by rents flowing to the owners of the dominant AI. Meanwhile, the marriage of AI and robots will put new pressure on unskilled labour.

Even if the more dire predictions of job losses from robotics and AI are not borne out, this much is clear: career trajectories and the nature of work are being transformed. Career changes will become more frequent. Skills upgrading will become more frequent and multi-year upfront education experiences less the norm – or even they

will be complemented by lifelong learning programs. At an extreme, the traditional firm-employee relationship might devolve into a series of simultaneous or sequential multiple contractual relationships between a worker and employer or between workers.

Social policies must adapt to this. In areas like transport, child care, education and pensions, the focus must move from "job centered" to "person centered". Student loan programs, tax deductions for fees and learning, currently often related to the age or income level of the individual, should become universal. Barriers to reskilling and public-private partnerships in learning will have to be removed. Limits on tax-free savings might give way altogether, while pension plans might go either entirely public or have total portability as a central feature. Indeed, a universal basic income scheme could be the dominant form of social safety net, with public goods like education and perhaps transport paid for by taxes on economic rents and wealth. We need to think and plan carefully about what this means for skills development and for labour adjustment strategies, and ultimately what it means for preserving domestic policy flexibility. I'm going to come back to this at the end.

As for machine-generated IP, new questions arise as regards who owns it and whether incentive frameworks for innovation originally formulated in the Renaissance continue to make any sense. These are important questions given that maximal IP protection is being globalized through trade agreements.

Inequality, Redistribution and the Social Safety Net (*slide 11*)

Because intellectual property is essentially a monopoly and ideas have little or no marginal production costs after their invention or creation, this naturally leads to inequality between those who create and own ideas and those that don't. The rise in inequality in the U.S. since the end of the 1970s is largely due to greater earnings inequality, but this is substantially amplified in this era of accumulating intangible stock asset wealth. If not properly addressed, the powerful AI & machine-learning revolution will drive this inequality to ever greater extremes.

We can't ignore the signals from the recent rise of populism and both right and left wing nationalism that large percentages of the population are anxious and frustrated, and questioning their faith in Western liberal democracy and the global trading system. The distributional issues that are generated by the economics of intangibles must be addressed. With solid GDP growth numbers and low unemployment, now is the time. As the experts in understanding and measuring the digital economy, your work on measuring the effects and potential consequences of possible economic structures is important on-going research that needs to be done.

Resolving the Four Core Elements (*slide 12*)

We are in the midst of an historic technology-driven transition in the way value is created and captured in our economies, in how our societies function, and in the sources of national wealth and power. Here I lay out four core elements that must be resolved together to craft a stable system that can advance welfare globally:

1. Safeguard national security in a cyber era,
2. Enable fair access to the new factors of production to participate in the value created in the knowledge-based and data-driven intangibles economy,
3. Protect and even enhance citizen welfare in the non-economic realms for privacy, democracy and ethics; and of course,
4. Comply with all international commitments under various agreements, including GATS/TRIPS/FTAs.

I submit to you all today that the top three – cyber security, fair economic access, and preserving sovereignty over social choice – can be resolved together and in fact can only be resolved satisfactorily if done together with appropriate national-level implementations. Data-driven technologies are becoming the core infrastructure around which most of society operates so states need to be able to shape approaches if the system is to be sustainable and accountable to citizens.

Different countries will have different implementations. The EU's implementation places greater weight on privacy and circumscribes its ability to capture economic value. The United States places the emphasis on capture of economic value, but national security is also a major interest. China primarily emphasizes national security but economic value capture is also a great priority.

The challenge comes with reconciling national-level choices in these domains with commitments in trade agreements that were made under different technological conditions and for the most part in ignorance of the value proposition in terms of the international distribution of benefits – because the rising tide in this older system generally lifted all boats.

Trade agreements have general exceptions to cover national security and fundamental social policy objectives. In principle, these exceptions can be called on to address problems as they surface. However, countries must be shrewd when it comes to their 21st century economic strategies or they will be out-maneuvered by more sophisticated states and private companies – and in the process lose their security, sovereignty and a fair shake at capturing their share of potential economic returns. Pay close attention to who controls the data.

The digital transformation has more than emerged and runs the risk of overtaking traditional measurement and reporting systems. In 1987, Robert Solow famously said that the computer revolution was everywhere but in the productivity statistics. Today, a similar statement can be made about data – it is everywhere but in the national economic accounts and the trade statistics. It is essential for good governance that this information deficit be closed. The IMF's work on updating its statistical approaches, the interpretation of data, and the formulation of economic advice is important and urgent.

I believe the IMF, with its mandate to promote international financial stability and monetary cooperation as well as employment and reduction of poverty is in a unique position to catalyze a new Bretton Woods moment – a gathering of its 198 members to address these new global realities as a result of unprecedented digital forces shaping our world. Nothing less than a historic gathering of key decision makers will forge a new global framework for addressing current challenges posed by the data-driven economy. Few leaders in the world have the leadership skills, credibility and impact as Madame Lagarde – an inspiration to women and men alike. And wouldn't it be powerful to see the IMF – a child of the original Bretton Woods agreement – give birth to a new system of rules for the digital 21st century and carve the path forward that enhances global digital cooperation and welfare.

Digital technologies are bringing profound structural changes in all economic and non-economic realms, but we need not fall prey to technological determinism. I am confident that these changes can be managed to the benefit of all. If you measure well, you signal to all politicians what is valuable and empower informed choices.

Thank you.