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Governance Innovation

CIGI Papers No. 136 — July 2017

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About the Author

Malcolm D. Knight is a CIGI distinguished fellow, with research interests in the governance-related aspects of macroeconomic policy making, global financial regulation and standard-setting, and the work of official international financial institutions. He served as general manager and CEO of the Bank for International Settlements from 2003 to 2008.

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From 2008 to 2012, Malcolm was vice chairman of Deutsche Bank (DB) Group, responsible for developing a globally coherent strategy and coordinating DB Group-wide work on regulatory reform and international financial stability. During 1999–2003, he served as senior deputy governor of the Bank of Canada, where he was the bank's chief operating officer and a member of the board of directors. From 1975 to 1999, he was with the International Monetary Fund, where he held senior positions in both research and operations. From 1971 to 1975, he taught at the University of Toronto and the London School of Economics.

About the Global Economy Program

Addressing limitations in the ways nations tackle shared economic challenges, the Global Economy Program at CIGI strives to inform and guide policy debates through world-leading research and sustained stakeholder engagement.

With experts from academia, national agencies, international institutions and the private sector, the Global Economy Program supports research in the following areas: management of severe sovereign debt crises; central banking and international financial regulation; China's role in the global economy; governance and policies of the Bretton Woods institutions; the Group of Twenty; global, plurilateral and regional trade agreements; and financing sustainable development. Each year, the Global Economy Program hosts, co-hosts and participates in many events worldwide, working with trusted international partners, which allows the program to disseminate policy recommendations to an international audience of policy makers.

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Executive Summary

In addition to the weak growth of domestic demand that has persisted in many countries since the onset of the global financial crisis in 2007, another crucial macroeconomic policy issue is the need to modernize and expand the international network of basic infrastructure to foster stronger long-term global growth of productivity and output capacity. This paper describes the nature of the supply-side issue and outlines the key policy elements that are needed in each Group of Twenty (G20) country to design and implement a successful National Infrastructure Investment Program (NIIP). It then describes how these NIIPs could be integrated into an internationally Coordinated Infrastructure Investment Program (iCIIP), and the leadership role that the G20 could play in carrying out the program of infrastructure renewal and expansion.

Introduction

Since the end of World War II, policies to integrate the global economy by fostering liberalization of international trade, unfettered movement of capital among countries and internationally consistent regulation of financial institutions have contributed to massive increases in global output and raised millions of people out of poverty. In recent years, however, public sentiment in a number of advanced countries has turned against this long-accepted consensus. Significant segments of the electorates in these countries are convinced that they have gained little from more than 70 years of international economic policy cooperation and trade liberalization. This trend is not just reflected in the Trump administration's focus on "America first" in the United States and last year's Brexit vote in the United Kingdom, but also in the appearance of anti-globalization, anti-free trade and anti-immigration movements in many countries in recent years.

Ironically, however, the present juncture offers a unique opportunity for new initiatives of international cooperation — if focused on the right economic policies — to be the most productive of any time in the last half century. This paper proposes that the G20 leaders adopt a specific set of internationally coordinated economic policies — a "blueprint" — to accelerate global productivity and per capita GDP growth. If implemented consistently over the next decade, this program could produce a historic "win-win" outcome, not only in the G20 countries but throughout the world.

Most discussions of international economic policy coordination focus on how the monetary-fiscal policy mix in each country can be adjusted to the economic conjuncture, in order to foster stronger global economic performance over the next year or two. The nine-year period since the onset of the global financial crisis in 2007 has indeed been marked by weak demand growth in most of the advanced countries and a sizeable number of emerging market economies as well; therefore, it is appropriate to give emphasis to policies of demand stimulus in many countries at the present juncture.

Demand management policies alone, however, cannot raise per capita GDP growth over the long run unless the resulting expansion of demand is matched by a *pari passu* increase in aggregate supply capacity — implementation of macroeconomic policies to strengthen aggregate demand is a necessary but not sufficient condition for sustaining global economic growth over the longer term. To support non-inflationary long-term growth requires net investment to increase capacity supply.

The weak aggregate demand growth that the world economy has experienced since the international financial crisis began in 2007 stems not only from weak investment by the private sector but also from the continuing reluctance of many national governments to renew, expand and modernize the stock of "basic infrastructure" capital that supports productive activity in their economies. Basic infrastructure comprises the facilities and systems that are essential for the national economy to function. It includes both "hard" and "soft" components. Hard basic infrastructure includes road networks, mass transit, railways and airports, water resources, electrical grids, telecommunications and hazardous waste management. Soft basic infrastructure includes the operating policies and procedures that facilitate the services needed by the community and the productive sector — education, health care, police and fire protection and basic financial services. Importantly, soft infrastructure also includes information technology (IT) networks that store, move and share data, thereby enhancing the efficiency of physical infrastructure.

Over many years, the networks of basic infrastructure in a considerable number of countries — on which productivity growth and innovation depend — have been allowed to depreciate and become obsolete. Air traffic control systems, electricity grids, road and rail networks, bridges and tunnels, mass transit systems, port facilities and marine navigation, educational facilities and financial market infrastructures are just some of the systems that are crucial to underpinning productivity growth in the broader economy. But these infrastructures are crumbling — they have become out of sync with the infrastructure needs of the private sector and the larger economy.

It is sometimes argued that weak investment in basic infrastructure is mainly due to the lack of focus on public-sector capital formation in the United States, but this issue extends much further. While the countries of Western Europe rebuilt their infrastructures extensively after World War II, recent technological innovations in transport, energy supply, telecommunications and IT clearly point to the need for a comprehensive renewal of this postwar infrastructure. National authorities in the European Union are keenly aware of the need to renew and expand basic infrastructure as an internationally consistent network across the union.

The failure to renew and expand basic infrastructure in a significant number of advanced and developing countries has left a legacy of rusting bridges, obsolescent factories and deteriorating mass transit and freight transport systems.

At the same time, a number of emerging market economies have been undertaking major infrastructure investments. China is the clearest example — its massive infrastructure investment was a key factor sustaining global demand and output growth during the post-crisis period of global demand stagnation. More recently, China's "One Belt, One Road" and Asian Infrastructure Bank initiatives reflect a keen awareness of the need to push ahead with ambitious basic infrastructure investment projects and integrate them internationally.

The G20 can build on initiatives such as these. A greatly increased focus on fostering increased investment in basic infrastructure has the advantage that it *both* stimulates aggregate demand in the short-to-medium term *and* strengthens aggregate supply over the long run. So, in current circumstances, investments that expand and modernize the stock of basic productive infrastructure capital are essential.

In September 2009, the G20 summit leaders agreed to implement a structural development program. Their statement said: "our objective is to return the world to high, sustainable, and balanced growth, while maintaining our commitment to fiscal responsibility and sustainability, with reforms to increase our growth potential and capacity to generate jobs" (G20 Leaders 2009, paragraph 3). But as the International Monetary Fund (IMF) has noted, little of this program has been implemented on the ground (IMF 2017a; 2017b). This appears to be mainly because the organizational structures needed to design and build internationally integrated infrastructure investment projects have not been agreed.

This paper is based on the conviction that a renewal of productive infrastructure is essential to fostering stronger long-term global growth, and that it would provide a large stimulus to both aggregate demand and aggregate supply capacity. The policy recommendation is that governments in a considerable number of countries should cooperate to put a new internationally integrated network of basic productive infrastructure in place.

This paper first outlines the key policy elements that are needed within each country to implement a NIIP. It then sketches out how these NIIPs could be integrated into an iCIIP and the leading role that the G20 could play in carrying it forward as the key element in sustaining better global growth performance.

If the G20 countries were prepared to coordinate their national infrastructure investment strategies and their macroeconomic demand management and supply-side policies internationally around a core set of agreed iCIIP policies, they could modernize and expand the international network of basic infrastructure and thereby set the global economy on a course of sustained non-inflationary growth, while simultaneously strengthening their long-run fiscal sustainability.

Addressing the Obstacles to Stronger Global Productivity Growth

The most obvious impediment to a sustained strengthening in productivity and output growth is the persistent weakness of fixed capital formation in advanced countries since the great financial crisis of 2007–2009, and — the other side of the coin — excessive corporate sector saving. This weakness, in turn, has several underlying causes. The first is uncertainty about whether the exit strategies of reserve centre central banks from their highly accommodative monetary policies of the past nine years will be well coordinated, and how they will affect various countries' interest rates and exchange rates.

A second impediment is uncertainty among private sector firms about how the regulatory framework governing their industries will change in the future. This uncertainty did not exist to the same degree prior to the major regulatory reforms that have been taking place in the wake of the international financial crisis, not only in the financial services sector, but also in other industries such as energy and pharmaceuticals, among others.

A third reason for low investment is that the planning, financing, construction and operation of essential elements of each country's productive infrastructure network has been primarily a government responsibility, because in the past it was difficult to charge user fees that would make infrastructure investment attractive to private sector firms. Politicians have priorities other than modernizing the infrastructure the economy needs. Too often, the horse-trading that occurs when politicians try to deal with rising fiscal deficits has fallen disproportionately on the expedient of postponing or cancelling infrastructure projects needed to maintain and expand each country's national capital stock.

Years of such band-aid political solutions have led to inadequate and outmoded infrastructure. We face a paradox: on the one hand, there are few past historical periods when technological innovations have been brought to the marketplace as rapidly as they are now in those industries where they can be quickly monetized for private profit. On the other, much of the network of basic productive infrastructure that is needed to support economic development has become decrepit and outmoded to such an extent that it comes nowhere near meeting what is required to support expanding private sector productive activity. On top of this, the problem of the low growth of aggregate demand globally since the onset of the international financial crisis in 2007 must be added.

A comprehensive program to renew and expand global basic infrastructure would address both these problems simultaneously. In the short-to-medium term, higher infrastructure investment could contribute substantially to stronger aggregate demand growth, as has been the case in China with its huge push in investment spending. Over the longer term, increased infrastructure investment will foster a stronger and more sustained expansion of aggregate supply capacity to match the accelerated growth of aggregate demand, thereby giving a better prospect that demand management policies can maintain low and stable inflation while simultaneously strengthening global per capita output growth. The challenge is that this will require an internationally coordinated program of increased investment in basic productive infrastructure that acts directly on the supply side of the macro-economy. Clearly, the way infrastructure is planned and put in place must change if the present obstacles to stronger long-term growth are to be overcome.

This paper gives a thumbnail sketch of how such an initiative could be designed, agreed and implemented by the G20. Obviously, this is an enormous task, and the chances of reaching agreement on it at this time may not be high. It is clear, however, that an integrated global economy requires an integrated system of basic productive infrastructure. It is also evident that such a project could potentially "kill two birds with one stone" by putting in place a set of policies that increase both aggregate demand and aggregate supply at similar rates globally over time, thereby also giving a better prospect for maintaining low, stable and predictable inflation, and reducing the volatility of exchange rates.

The main objection to a policy of strongly increasing investment in basic infrastructure is that many countries already have large fiscal deficits and high ratios of public debt to GDP — they cannot afford to undertake needed infrastructure investment without damaging their long-run fiscal positions further.

However, this objection is much less relevant now than it would have been two decades ago. Today, spending on infrastructure no longer requires a commensurate increase in the fiscal deficit. In the past, it was difficult to charge for basic infrastructure through user fees. As an example, 20 years ago, cars on US toll roads had to stop frequently at pay booths, causing massive traffic delays and congestion when there was heavy traffic. Modern technology, however, has eliminated problems such as these by making it feasible and inexpensive to charge basic infrastructure users the full cost of the services provided. Examples abound — such as electronic systems that automatically charge vehicles for using the road without any significant slowdown in traffic circulation. One can point to dozens of similar innovations that have made it possible to charge for services provided by basic productive infrastructure.

Of course, each country's government is responsible for establishing the priorities for long-run development of the national economy. However, the decisions regarding which new basic infrastructure investment projects to focus on to achieve these goals, as well as the design and sequencing of the investment program, should be based on a cost-benefit analysis to determine the infrastructure investment projects that will be the most effective in strengthening productivity and output growth in the domestic economy over the long run, rather than on partisan political trade-offs.

Furthermore, to limit the effects of major infrastructure project expenditures on their fiscal positions, governments need to find effective ways to encourage the private sector to finance and implement the infrastructure investment projects. This means developing policies for pricing the services provided by basic infrastructure and financing mechanisms that encourage private sector firms to undertake infrastructure investment projects. At the same time, governments will likely need to modify their income taxation policies to ensure that these incentives do not inadvertently redistribute income to the richer segments of society.

There are two crucial reasons why national infrastructure development programs need to be coordinated internationally. First, from a supply-side perspective, a globally integrated economy requires an internationally interconnected network of both hard and soft infrastructure — whether it is air, sea or land transport systems, cyber security or investment projects designed to provide alternative energy sources that limit climate change. Second, on the demand-side, it is important that the stimulative demand effects of an acceleration in the construction of infrastructure are internationally coordinated so they do not lead to large variations in demand growth across countries, exchange rate instability and unsustainable rates of growth in economic activity that could cause inflation and exchange rate and output instability.

Accordingly, this paper proposes that each G20 country establish a NIIP and that the broad cross-country consistency of NIIPs be managed through an iCIIP under the auspices of the G20. The next two sections describe NIIPs and iCIIPs.

NIIPs

The goal of the NIIP in each country would be to focus on building an integrated state-of-the-art infrastructure in which the main projects support the national production network, thereby establishing the basis for stronger productivity growth in key sectors. Each NIIP should have the following essential elements:

→ The government should establish the broad priorities for national economic development, but the overall design of the NIIP — decisions on the blueprint for investments in productive infrastructure — should not be planned directly by politicians. Instead, the government should establish a high-level commission of specialists in the design, construction and management of large, integrated capital investment projects. The commission's first task should be to prioritize the types of infrastructure that are most productive for the economy as a whole, how much should be built each year and the sequencing of construction of the key projects in the country's renewed and expanded productive infrastructure network.

→ Each national commission would provide its government with recommendations on the priorities of the infrastructure investment program for the NIIP and their sequencing, proposals for how the private sector could finance the needed infrastructure projects, and the output pricing mechanisms that would induce private firms to undertake the projects of the NIIP in a coordinated fashion on a for-profit basis. Following receipt of the commission's recommendations, the government would have a fixed period in which to approve or modify the proposed NIIP.

→ In order to make this program feasible and successful, many governments will need to take measures that encourage greater private sector participation in the planning and construction of basic infrastructure.[1] Another crucial element of the government-approved NIIP is that it must give private sector firms confidence that they can expect to earn an economic rate of return on their investment in basic infrastructure while meeting the performance requirements specified by the commission. Contracts should be awarded by open tender. To the extent that each country's NIIP focuses on getting private sector firms to build key infrastructure projects, it can be implemented with a much smaller impact on fiscal deficits than in the past, so that it does not impede fiscal consolidation.

→ Since the infrastructure investment projects will take several years to plan and a longer period to implement, construction of key pieces of infrastructure in each country needs to be carefully sequenced to avoid bouts of excess demand that could create unwanted surges in inflation and excessive weakening of the country's external current account. The commission should also be responsible for proposing this schedule to the national government.

→ Another issue is the need to invest in basic infrastructure that is crucial for broad socio-economic development but where externalities make it difficult to find pricing mechanisms that will attract private sector involvement in the project. Here the government's role in financing infrastructure is likely to remain central — examples are capital investments in education, health services, resource management, pollution control, basic research, security and mitigating climate change. But even in these areas of basic infrastructure, the government can use more novel pricing and financing mechanisms to increase private sector involvement in infrastructure projects. For example, inducements could include public-private partnerships, "build, operate and transfer" arrangements or government guarantees of private sector debt issues.

→ To give the private sector the confidence needed to build and operate a large portion of the NIIP infrastructure, the government must ensure that its legal and regulatory framework provides strong economic incentives for corporations to undertake the key fixed investments, and commit to maintaining a stable legal and regulatory environment. This will give firms the confidence that the profitability expected at the time the project is initiated will not be undermined by unanticipated future changes in the legal and regulatory framework.

→ Finally, it is important to acknowledge that during the two decades of the "Great Moderation" prior to the onset of the financial crisis, income and wealth taxation policies did not keep pace with the major structural changes caused by technological innovation, globalization and deregulation, which tended to redistribute after-tax income toward the high-income segments of the global economy. Without appropriate changes in tax policies, privatization of public infrastructure could exert further regressive disparities in the distribution of income and wealth. Accordingly, redistributive income and wealth taxation policies should also be part of the NIIPs in a number of countries.

1 Basic infrastructure may be developed and operated in the public sector, the private sector or in public-private partnerships. In many countries, most roads, ports and airports, water distribution systems and so on are publicly owned, whereas most energy and telecommunications networks are privately owned. Publicly owned infrastructure may be paid for from taxes, tolls or metered user fees. Privately owned infrastructure is typically paid for by metered user fees.

Proposal for an iCIIP

It will be essential that the NIIPs of individual G20 countries are coordinated internationally to a reasonable degree.

First, given the tight production and communication linkages in today's interconnected global economy, the infrastructure constructed in each country — for example: freight and passenger transport systems; energy delivery; land, air and maritime transport facilities; telecommunications networks; physical and cyber security systems; financial system infrastructures — needs to interconnect with the infrastructure in other countries as seamlessly as possible, and to use consistent technical standards. The international network of infrastructure also needs to be designed with appropriate redundancy across countries, to assure the robustness of the overall production system.

Second, it will be essential for G20 governments to continue to coordinate their economic and financial policies to address the international spillovers from differences in the pace of infrastructure investment and demand stimulus across countries and over time.

Third, international coordination will also be important to avoid stimulating excessive demand in several countries at the same time, thereby intensifying global demand pressures, raising inflation and exacerbating the risk of an unsustainable boom in global output.

For these reasons, it is essential that the renewal, expansion and modernization of global productive infrastructure are coordinated under an iCIIP. This will increase the efficiency of the global economy and optimize the stimulative effects of infrastructure investment on global productivity and output growth. Of course, the iCIIP cannot be implemented by fiat. It will require broad agreement among the G20 leaders on priorities to foster productivity growth in the global economy, and it will need more specific direction at the level of G20 finance and economic ministries, central banks and regulatory authorities. This will require a coordinating body to oversee implementation of G20 iCIIP priorities.

During the period when major national infrastructure investment projects are being put into place pretty much simultaneously in many countries over a time frame of more than a decade, national implementation rates will need to be sequenced internationally through the iCIIP. Otherwise, the stimulus to aggregate domestic demand in those countries that are implementing the most ambitious infrastructure initiatives could push up their real exchange rates, sucking in more imports, reducing the stimulative demand effects of their infrastructure investment programs on their domestic economies, causing their external current account positions to weaken and increasing their reliance on foreign capital inflows.

For example, the Trump administration in the United States is committed both to implementing a very large project to renew and expand basic infrastructure *and* to a policy of increased trade protectionism. These policies are mutually inconsistent. If the United States embarked on a massive infrastructure renewal program while simultaneously tightening restrictions on imports, the domestic demand stimulus would likely result in a large appreciation of the US dollar against other currencies. This would offset the positive employment and output effects of the infrastructure initiatives, and increase inflationary pressures that could price US labour out of world markets. In sum, for the United States to combine massive infrastructure investment with increased protectionism would be exactly the wrong policy mix, both for the United States and for the global economy. The sorely needed renewal of global infrastructure must be internationally coordinated under an iCIIP agreed by global leaders at the G20 summit level.

Governance of the iCIIP

This brings us to the question of the governance of the iCIIP. The G20 is the obvious group where the key decisions on an iCIIP can be taken, under the broad guidance of the G20 leaders' summit meetings.

The G20 leaders' summit process would agree on the modalities for overseeing the planning and implementation of the iCIIP. It would require considerable resolve on the part of the G20 leaders to reach agreement on how to design and oversee the operational structure needed to implement such a vast internationally coordinated network of infrastructure investment projects. The G20 does, however, have experience in this area through its program to reform the global architecture of financial regulation, which has been progressing since the first G20 leaders' summit was held in Washington, DC, in November 2008 (Knight 2014).

A particular challenge will be for the G20 leaders to reach a shared view on the appropriate ways of inducing the private sector to build, finance and operate the new infrastructure network. Since infrastructure projects take a long time to plan and build, another key challenge for the G20 will be to maintain its focus on these issues throughout the life of the iCIIP, which is likely to be a decade or more. The financing of the projects in the iCIIP will need to be phased in over an extended period to avoid a bubble of corporate bond issues and other private sector financing, and to mitigate global inflationary pressures. The G20 program will also need to be flexible enough in its implementation to allow for incorporating new productive technologies as they come on stream. Successive G20 leaders' summits will give political impetus to the design of the iCIIP at the highest level, and to the oversight of its implementation over the next decade or more.

The outcome of the recent 2017 Group of Seven (G7) summit in Italy — sometimes irreverently referred to as the "G6 plus Trump" summit — does not augur well for the G7 group playing a strong constructive role in a project as ambitious as the iCIIP. However, under the right circumstances, the G7 countries could play a useful part in moving forward on specific types of infrastructure initiatives. For example, one important enhancement to the international network of soft infrastructure could be achieved if the G7 leaders could agree to adhere to a single, consistent legal and regulatory framework for restructuring and resolving distressed global systemically important financial institutions (G-SIFIs). Such an agreement is essential in order to give a reasonable prospect of ending the "too big to fail" problem that destabilized the international financial system in 2008.

Since the G7 countries are the home jurisdictions of many G-SIFIs, it is in their mutual interest to reach an internationally consistent legal and regulatory regime for restructuring and resolving distressed G-SIFIs. Other G20 countries that are host jurisdictions of G-SIFIs would doubtless see the achievement of such a G7 agreement as a "positive externality" that could increase the stability of their own financial systems and, provided the agreement was non-discriminatory, they might be keen to adhere to it themselves.

The technical aspects of keeping the implementation of the iCIIP on track should be undertaken by an international board of experts in the management of complex infrastructure programs, appointed by the G20 leaders. This board would then have a mandate to call on the relevant official international economic, financial and development institutions to assist with elements of the iCIIP in their specific areas of competence. It could have a "light touch" organization with a small staff, analogous to the structure of the Financial Stability Board, which has successfully coordinated the work to implement the G20's program to reform the global architecture of financial regulation since 2008.

Other Policies to Support the iCIIP

Since it will take at least a decade to bring the iCIIP to fruition, it will be necessary not only to coordinate the implementation of infrastructure policies among the G20 countries, but also to coordinate policies in other areas — particularly demand management, trade liberalization and regulation. Policies in these areas will need to respond to the changing global economic conjuncture, with the goal of mitigating the risk that divergences in the rates of growth of economic activity in different countries could cause large and undesirable macroeconomic and financial spillover effects.

There is not the space in this paper to discuss these supporting policies in detail, although they will be crucial to the ultimate success of the iCIIP. This section provides only a brief overview of the areas where coordination is likely to be most needed. The key will be to ensure that fiscal and monetary policies, regulatory policies and trade liberalization strategies reinforce the positive effects of increased global infrastructure investment in fostering stronger global productivity and output growth than would have been possible without the iCIIP.

Demand Management Policies

During the period when the iCIIP is being implemented, the fiscal and monetary policies of each G20 economy will need to respond to the changing global economic conjuncture with the goal of maintaining an appropriate balance in each country between increases in aggregate domestic demand resulting from the rate of implementation of each country's NIIP, the size and timing of its domestic aggregate supply response and its need to maintain a sustainable balance-of-payments position at an appropriate exchange rate. Here coordination of demand management policies among the countries of the G20 will be highly important. The G20 countries have long focused on coordinating their counter-cyclical macroeconomic policies as the economic conjuncture unfolds, and it will be essential to continue to focus on these issues from year to year.

Monetary Policy

In early 2017, US President Trump's statements that his administration intends to implement a US$1 trillion infrastructure investment program to rebuild the country's infrastructure have been associated with a rise in US and global market interest rates as well as in the value of the US dollar. As the iCIIP is implemented over the next decade, global interest rates and inflation are likely to increase, perhaps significantly. If US inflation were to increase to the Federal Reserve's targeted level of two percent in response to the marked strengthening of demand associated with the iCIIP, nominal long-term bond yields on US Treasury debt would likely rise at least into the four to five percent range.

In this case, the US and other key reserve central banks would need to raise policy interest rates at least in tandem with the increases in market yields, and perhaps beyond in countries where capacity utilization was rising at a pace that could trigger accelerating wage and price inflation. Likewise, non-reserve central banks would have to adjust their monetary policies to control domestic demand in their jurisdictions and to mitigate the large swings in real exchange rates that could occur as individual countries' NIIPs were implemented at different rates.

Furthermore, in an age when sharply differing monetary conditions in different countries create incentives for large currency "carry trades," those countries that accelerate infrastructure spending the most rapidly may experience unwanted and sustained real appreciation of their exchange rates to levels that are not consistent with their productive structure. In such cases, coordination of monetary and macroprudential financial regulatory policies would help to prevent the effects of the demand stimulus from infrastructure spending from being weakened or offset by large changes in real exchange rates that would make it difficult for businesses to determine which private sector projects were profitable in the international marketplace over the long run.

These concerns underscore that the normalization of monetary policies in the key reserve centre countries must be carefully coordinated in order not to give rise to excessive exchange rate volatility, and other countries must implement monetary policies designed to reduce the risk that their exchange rates will move too low or too high to be consistent with the global conjuncture. This can be done in a low-key way in the context of the bimonthly meetings of central bank governors that take place at the Bank for International Settlements in Basel, Switzerland.

Fiscal Policy

Many countries' fiscal positions will need to be adjusted steadily over the medium term to ensure that they regain long-run sustainability. In analyzing the sustainability of the fiscal position, the authorities should define overall fiscal sustainability in a way that takes account of the debt service on those infrastructure projects that yield an economic rate of return while fully servicing obligations that the government has taken on in order to induce the private sector to implement the projects.

Liberalization of International Trade

In order for the iCIIP to have the maximum positive impact in building a new global infrastructure network, the G20 must continue to advance international trade and investment agreements that foster more liberal, rules-based expansion of trade and investment. Contrary to what has been said by the US president and others about the advantages of trade protectionism, the key will be for national governments to continue to agree on comprehensive, rules-based trade and investment liberalization agreements —

such as the Transatlantic Trade and Investment Partnership and the Trans-Pacific Partnership.

Internationally Consistent Regulatory Policies

The evolution of regulatory policies must take account of the need for international consistency in certain areas — for example, regulation of G-SIFIs, key financial markets and payments infrastructures; technical standards for economic activities that are international in scope; health standards, and so on. Uncertainty about the future regulatory regime is currently restraining investment in the global economy. Companies in many sectors — renewable and non-renewable resources, energy, pharmaceuticals, transport and agribusiness, to name but a few — will be reluctant to invest in the long-lived capital and training that are needed to foster stronger output growth if they are uncertain how the regulatory environment for their industry will be altered in the future.

Conclusion

The need for modernization of the global productive infrastructure — both hardware and software — is one of the biggest macroeconomic policy coordination issues presently confronting global economic policy makers. A successful program of investment in the global infrastructure network would improve global employment, productivity growth, per capita GDP and human welfare over the long term. Designing and implementing a massive renewal of the world's infrastructure network will require intensive international cooperation, so it is the major issue of macroeconomic policy coordination that the leaders of the G20 countries need to address over the long term.

This paper has proposed comprehensive new arrangements for NIIPs in each G20 country that would be embedded in an iCIIP. Such a proposal is obviously highly ambitious. But, as this paper has argued, an internationally coordinated infrastructure program of this sort will be essential if the broad goal of strengthening long-run productivity and output performance in the global economy is to have a reasonable chance of success.

Author's Note

This CIGI paper is a revised and expanded version of a paper presented at the conference Major Challenges for Global Macroeconomic Stability and the Role of the G7, organized by the Instituto Affari Internazionali in Rome, March 27-28, 2017. I am indebted to conference participants and four referees for helpful comments and suggestions.

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About CIGI

We are the Centre for International Governance Innovation: an independent, non-partisan think tank with an objective and uniquely global perspective. Our research, opinions and public voice make a difference in today's world by bringing clarity and innovative thinking to global policy making. By working across disciplines and in partnership with the best peers and experts, we are the benchmark for influential research and trusted analysis.

Our research programs focus on governance of the global economy, global security and politics, and international law in collaboration with a range of strategic partners and support from the Government of Canada, the Government of Ontario, as well as founder Jim Balsillie.

À propos du CIGI

Au Centre pour l'innovation dans la gouvernance internationale (CIGI), nous formons un groupe de réflexion indépendant et non partisan qui formule des points de vue objectifs dont la portée est notamment mondiale. Nos recherches, nos avis et l'opinion publique ont des effets réels sur le monde d'aujourd'hui en apportant autant de la clarté qu'une réflexion novatrice dans l'élaboration des politiques à l'échelle internationale. En raison des travaux accomplis en collaboration et en partenariat avec des pairs et des spécialistes interdisciplinaires des plus compétents, nous sommes devenus une référence grâce à l'influence de nos recherches et à la fiabilité de nos analyses.

Nos programmes de recherche ont trait à la gouvernance dans les domaines suivants : l'économie mondiale, la sécurité et les politiques mondiales, et le droit international, et nous les exécutons avec la collaboration de nombreux partenaires stratégiques et le soutien des gouvernements du Canada et de l'Ontario ainsi que du fondateur du CIGI, Jim Balsillie.

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