Covid-19 and fiscal stimulus: The economic and political case for coordinating fiscal stimulus[1]

Adam Triggs

31 July 2020

Abstract

The paper analyses the G20's coordinated fiscal stimulus from 2008 to 2010 to explore the economic and political case for coordinating fiscal stimulus in response to Covid-19. The paper combines qualitative and quantitative research methods: using a general equilibrium model of the G20 and the results from interviews with G20 leaders, ministers, central bank governors and officials. It shows that more than half of the G20 countries undertook more fiscal stimulus because of the G20's agreement than they otherwise would have done. It finds that the first-year GDP gains from fiscal stimulus are twice as large when G20 countries coordinate. While most countries benefit from coordination, some suffer a loss depending on their economic characteristics. GDP gains to the global economy are a third smaller if stimulus by relatively indebted countries increases risk premia, but this cost is smaller than the cost of not having stimulus from those countries. The paper explores what these results mean for the response to Covid-19.

Keywords: Macroeconomics, international trade and finance, computable general equilibrium models, econometric modelling, mathematical methods, intertemporal choice, fiscal policy.

JEL Codes: F4, C68, C5, C02, E17, D9, D58

[1] I would like to thank Peter Drysdale, Warwick McKibbin, Shiro Armstrong, Gordon de Brouwer, David Vines, Barry Sterland and Homi Kharas for their comments. All errors are mine. I am grateful to the 61 politicians and officials who generously gave their time to be interviewed for this research.

1. Introduction

In 2009, the leaders of the G20 countries announced the largest coordinated fiscal stimulus program in history. They committed to a coordinated fiscal expansion worth US$5 trillion to raise world output by 4 per cent (G20, 2009). Their actions were described as an unprecedented response to a "once in a lifetime crisis" (Reuters, 2008).

> Without the actions of the G20, what started as a financial crisis would have quickly become a trade crisis, then an economic crisis, then an employment crisis, then a social crisis and then a political crisis – *Kevin Rudd, 26th Prime Minister of Australia, interviewed 8 September 2017.*

Little did those leaders know that the world would be facing a second "once in a lifetime crisis" just 11 years later. In 2020, G20 leaders found themselves once again undertaking substantial fiscal stimulus packages to protect their economies, this time in response to a global pandemic. In March 2020, G20 leaders announced that they were collectively injecting $5 trillion into the global economy "as part of targeted fiscal policy, economic measures, and guarantee schemes to counteract the social, economic and financial impacts of the pandemic" (G20, 2020), a figure which increased significantly in the months that followed.

There remain lessons that can be learned from the coordinated fiscal stimulus of 2008 to 2010 that can help guide the response to the Covid-19 pandemic. The benefits of coordinating fiscal stimulus in the face of a widespread shock are generally accepted (see Resende, Lalonde and Snudden, 2010; Bayoumi, 2014; OECD, 2009; Auerbach and Gorodnichenko, 2017, for example), but questions remain around how big those benefits are, how those benefits are distributed across countries and the impact of increased risk premia when heavily-indebted countries also participate in fiscal stimulus (see, for example, Corsetti et al, 2010; McKibbin and Stoeckel, 2011; Ilzetzki, Mendoza and Végh, 2011; Veld and Roeger, 2013).

More importantly, questions remain about whether global coordination agreements involve genuine coordination or not. When G20 countries are hit by a common shock, they often have an incentive to undertake fiscal stimulus regardless of what other countries do. Conversely, if coordination is genuine and countries alter their policies because of a G20 agreement, there is potentially an incentive for countries to cheat on the agreement and free ride on the stimulus efforts of others. There is no clear understanding in the literature on whether the G20 resulted in countries doing more fiscal stimulus from 2008 to 2010 and what role, if any, the G20 plays in boosting the credibility of commitments.

> Fundamentally, policy in the United States won't be pulled by international consensus, it will be driven by domestic policy considerations and domestic politics. There can be a backlash in the United States if you make the argument that you are doing something to comply with international rules rather than as a domestic choice. But consensus from the G20 was not unwelcome – it certainly helped in getting action from other countries – *Jacob Lew, former Treasury Secretary, United States, interviewed 7 September 2017.*

Many of these issues relate to the broader question of what role political considerations play in a global fiscal coordination agreement. The economic benefits of macroeconomic coordination receive more attention in the literature than the political benefits. But the economic and political benefits are difficult to separate in practice. It is the combination of the two that encourages politicians to agree to coordination in the first place. Little is known about the role that the G20 plays in influencing domestic fiscal policy settings and how politicians and officials use the G20 to achieve their objectives.

> The G20 provides a framework for politicians to argue domestically to do things that they otherwise couldn't do but want to do. It provides political backup – *Wayne Swan, former Treasurer, Australia, interviewed 21 March 2017.*

> The G20 is a forum in which you can share diagnoses, figure out what makes sense and try at the margin to come up with something together that is more powerful than what you would achieve otherwise – *Former senior official, United States, interviewed 12 September 2017.*

These are the issues explored in this paper. The paper uses data analysis, a new computable general equilibrium model called the G-Cubed (G20) model and results from interviews with 61 leaders, finance ministers, central bank governors, sherpas and finance deputies from G20 countries to consider both the economic and political dimensions of coordinated fiscal stimulus. Participants included Kevin Rudd, Janet Yellen, Haruhiko Kuroda, Ben Bernanke, Jack Lew, Mark Carney and 55 other politicians and officials to whom I am deeply grateful. The paper concludes with a discussion of what these findings mean for the G20 in the economic response to the Covid-19 pandemic.

2. Fiscal stimulus and the G20

A preliminary question is whether G20 countries do what they say they will do. This was explored in Triggs (2018). At the London summit in 2009, G20 leaders committed to a "concerted fiscal expansion… that will, by the end of [2010], amount to US$5 trillion and raise output by 4 per cent" (G20, 2009). The G20 committed to a 'fiscal expansion' not 'fiscal stimulus: the former includes the effects of automatic fiscal stabilisers (such as payments to the unemployed) whereas the latter refers to spending and taxation measures deliberately undertaken by the government (see IMF, 2009).

The IMF calculated the G20's combined fiscal stimulus from 2008 to 2010 to be US$1.72 trillion and its combined fiscal expansion to be US$5.36 trillion, thus achieving the G20's goal of US$5 trillion (IMF, 2009). Around 34 per cent of this fiscal expansion came from discretionary stimulus measures while 36 per cent came from automatic stabilisers and 30 per cent from other measures (primarily defence spending that was

not related to the crisis)[2] (IMF, 2009). The most recent data suggests the final fiscal expansion was larger: US$6.38 trillion.

The largest fiscal expansion, measured in US dollars, was from the United States, followed by Japan, the United Kingdom and Germany (Figure 1). When measured as a per cent of GDP, the largest fiscal expansions came from the United States, Russia, the United Kingdom and Australia (Figure 2). The smallest fiscal expansions measured as a percentage of GDP came from Brazil and Indonesia — both contracted fiscal policy from 2008 to 2010 — and Argentina, Korea and Turkey. China's fiscal expansion is understated by these measures because much of China's stimulus was through expanded credit by state-owned banks (see Pei, 2012).

Modelling from the IMF (2009), Freedman et al (2010) and the ILO (2010) conclude that the G20 likely achieved its goal of raising world output by 4 per cent, and these estimates were based on the expansions measured in 2009 which were US$1 trillion smaller than what was ultimately delivered. World output increased by 8.5 per cent from 2008 to 2010, or 5.4 per cent if measured from a 2009 baseline.

Figure 1: Fiscal expansion in US dollars

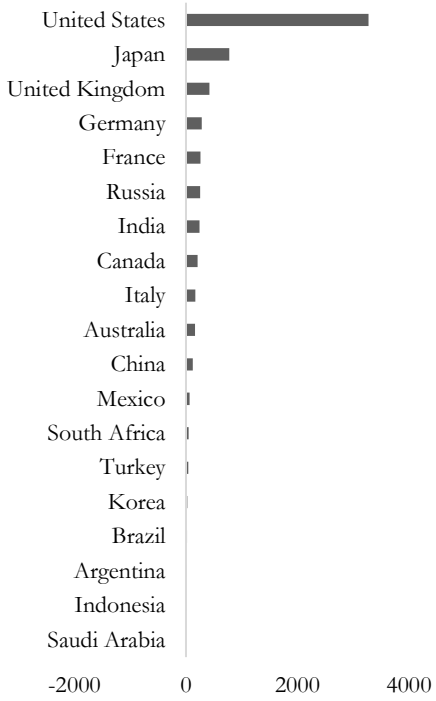
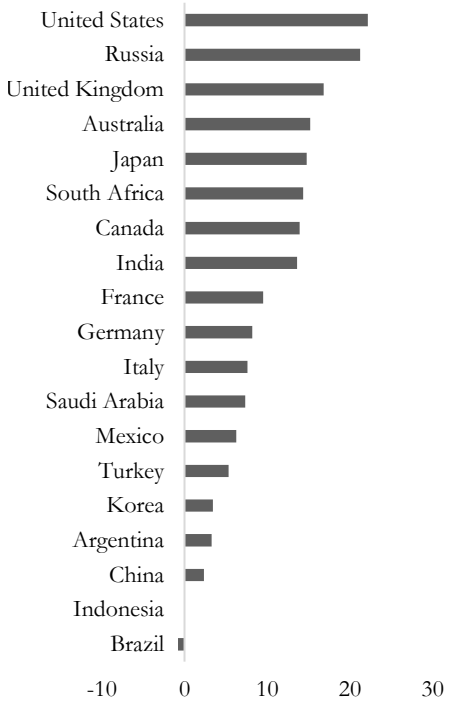


Figure 2: Fiscal expansion as a % GDP



Source: Triggs (2018). Data from IMF (2009)

[2] Includes non-crisis related discretionary spending or revenue measures (mostly defence spending) and the impact of non-discretionary effects on revenues beyond the normal cycle.

3. Is the whole greater than the sum of its parts?

Fiscal stimulus impacts many variables in an economy. Some of these effects are positively signed, some are negatively signed, all of differing magnitudes. This occurs within a complex set of trade and financial linkages between countries that have different economic characteristics. A general equilibrium framework is useful to understand these complex interactions.

To measure the effects of coordination, the outcomes from three scenarios are compared:

1. The impact of a 1 per cent of GDP increase in government spending by each G20 economy when acting alone (E.g. where the US stimulates and others do not, where Korea stimulates and others do not, and so on).
2. The impact of a 1 per cent of GDP increase in government spending by each G20 economy when acting together.
3. The impact of the same coordinated fiscal expansion in (2) but when risk premia increase because of stimulus from heavily indebted G20 countries.

3.1 The G-Cubed (G20) model

The model used in this analysis is the G-Cubed (G20) model: a multi-country, multi-sector, intertemporal general equilibrium model. Different versions of the model have been incrementally developed to explore different policy issues and different country groupings. The version of G-Cubed summarised here (the full specifications are in McKibbin and Triggs, 2018) was designed specifically to explore the implications of the G20's growing policy agenda, from fiscal and monetary policy cooperation to coordinated structural reform and commitments to reduce global trade and current account imbalances.

The G-Cubed model has successfully replicated the outcomes from many past shocks, including the Asian financial crisis, the impacts of 'Reaganomics', NAFTA, fiscal consolidation in Europe in the 1990s, German reunification (McKibbin and Vines (2000) reviews the effectiveness of the model in explaining the adjustment process in each of these shocks), the global financial crisis (McKibbin and Stoeckel, 2018) and, more recently, the Covid-19 pandemic (McKibbin and Fernando, 2020).

Each of the G20 countries in the G-Cubed model is represented by its own general equilibrium model with markets for goods and services, factors of production, money and financial assets (bonds, equities and foreign exchange), with flows of goods and assets between each country. The model integrates the real and financial markets with explicit arbitrage linking real and financial rates of return. The countries outside of the G20 are represented by four additional regions: the rest of the OECD, the rest of Asia, other oil-producing countries and the rest of the world. The model includes six industries that produce six goods (energy, mining, agriculture, durable manufacturing, non-durable manufacturing, and services) where each good from a particular country is

an imperfect substitute that good from other countries. In effect, therefore, there are 144 goods (Table 1).

Table 1: Overview of the G-Cubed (G20) model

Countries (20)	**Regions (4)**
Argentina	Rest of the OECD
Australia	Rest of Asia
Brazil	Other oil producing countries
Canada	Rest of the world
China	
Rest of euro zone	**Sectors (6)**
France	Energy
Germany	Mining
Indonesia	Agriculture (including fishing and hunting)
India	Durable manufacturing
Italy	Non-durable manufacturing
Japan	Services
Korea	
Mexico	**Economic Agents in each Country (3)**
Russia	A representative household
Saudi Arabia	A representative firm (in each of the 6 production sectors)
South Africa	Government
Turkey	
United Kingdom	
United States	

Source: Triggs (2019)

Each country consists of six representative firms (one firm in each industry), a representative household and a government.

Firms choose their production inputs (labour, capital, energy and materials) and make investment decisions to maximise their stock market value (represented by the present value of the future stream of dividends). They are assumed to be price-taking. Households maximise an intertemporal utility function subject to a lifetime budget constraint that the present value of their consumption equals the present value of their future stream of after-tax labour income (plus transfers from the government) and their initial financial assets.

The model is based on explicit optimisation by firms and households, but the behaviour of firms and households is modified to allow for short-run deviations from optimal behaviour. This could be interpreted as near-sightedness in their decision-making or be due to liquidity constraints on the ability of some firms and households to borrow. These deviations take the form of rules of thumb, which are consistent with an optimising agent that does not update predictions based on new information about future events.

As the below simulations will highlight, these rules of thumb generate the same steady-state behaviour as optimising agents so that, in the long-run, there is only a single intertemporal optimising equilibrium of the model. Short-run behaviour, however, is assumed to be a weighted average of the optimising agents and the rule-of-thumb agents. This allows the model to reflect the inertia observed empirically in investment and consumption decisions (see McKibbin and Sachs, 1991).

For households, aggregate consumption is a weighted average of consumption based on wealth (current asset valuation and expected future after-tax labour income) and consumption based on current disposable income. For firms, aggregate investment is a weighted average of investment which, in turn, is based on Tobin's q (market valuation of the expected future change in the marginal product of capital relative to the cost) and is based on a gradually learning Tobin's q which partially adjusts to the forward-looking Tobin's q (for rule-of-thumb firms).

Of key importance for the simulations that follow is the role of governments and central banks in the model. Central banks in each economy follow a Taylor rule with weights in different countries on output growth relative to trend, inflation relative to the target, and in some case weights on nominal exchange rates relative to a target. Some countries such as Saudi Arabia peg exactly to the U.S. dollar so the weights on inflation and output growth are zero, and the weight on the exchange rate is very large. Other countries such as China follow a crawling peg with some weight on inflation and the output gap but an additional weight on change in the Yuan/U.S. dollar exchange rate. Within the eurozone, a single central bank sets monetary policy with weights on euro zone-wide output growth relative to the target and euro zone-wide inflation. The nominal policy interest rate is equal across Germany, France, Italy and the rest of the eurozone.

The fiscal rules followed by each country are standardized across countries. Government spending is a constant share of baseline GDP with tax rates on households and firms and tariff rates of trade constant at the rates in 2015. There is a lump-sum tax on households that changes in response to changes in the interest payments on government debt. The fiscal closure is called an incremental interest payments rule in McKibbin and Sachs (1991). Budget deficits are endogenous given these assumptions, but fiscal sustainability is assured by the fiscal rule which sets lump-sum taxes equal to the change in servicing costs on government debt. After a shock, in the long run, the stock of debt to GDP will stabilize at a level equal to the long-run primary fiscal deficit divided by the real growth rate of the economy. The fiscal closure assumption implies that a fall in productivity will lead to a permanently higher stock of government debt to GDP and a rise in productivity will lead to a permanently lower stock of debt to GDP. Alternative fiscal closures can significantly change the results in this paper. Future research will explore the interaction of the fiscal closure assumption and changes in productivity growth.

The following simulations further elaborate the key features of the model, the full details of which are available in McKibbin and Triggs (2018).

3.2 Coordinated versus uncoordinated fiscal stimulus

The results from two scenarios are compared: where G20 countries implement stimulus individually and where they implement stimulus together. The increase in spending in these scenarios is assumed to be equal to 1 per cent of GDP each year for 3 years: the same length of time as the G20's 2008-2010 fiscal stimulus commitments. It is assumed that all spending is on goods and services with no effect on productivity. This is a realistic assumption given that, as discussed earlier, only 34 per cent of the G20's fiscal expansion was on deliberate increases in spending, and only a fraction of this was on investments such as infrastructure (see IMF, 2009 pp.1-2 for a breakdown). Unless otherwise indicated, all results are expressed as the change relative to the baseline (the 'business-as-usual' case).

Uncoordinated stimulus

The scenario where countries implement stimulus individually implies 20 separate simulations: where the US stimulates and others do not, where Japan stimulates and others do not, and so on. To understand the mechanics behind the model, it is useful to consider one simulation in detail: where the United States undertakes stimulus and the other G20 countries do not (see Figures 3 to 8). This is similar to the tax cuts implemented by the Trump Administration prior to the Covid-19 pandemic.

As would be expected, the increase in government spending increases the size of the United States fiscal deficit, which is between 0.8 and 1 per cent higher than the baseline over the three years of stimulus (Figure 3). The model assumes that the government finances its increase in spending by issuing bonds. The increased demand placed on savings puts upward pressure on real interest rates. Higher interest rates depress investment, along with forward-looking firms which anticipate a less-favourable, higher tax environment in the future to pay for the increased government spending today. Investment contracts by 0.8 per cent below baseline in the third and fourth years, settling around the baseline by 2027 (Figure 4).[3]

Consumption is initially higher from the short-term increase in government spending (Figure 5). But, like firms, forward-looking households anticipate lower wealth in the future due to the higher taxes required to pay for the increase in governments spending and thus reduce current consumption, facilitated by higher real interest-rates which encourage lower consumption (and more savings) today. Backward-looking (or liquidity constrained) households take longer to adjust.

[3] It should be noted that recent empirical work by Furman and Summers (2019) and Blanchard (2019) argues that, in a world of low inflation and low interest rates, increased spending has a much more limited impact on inflation and interest rates that these results would suggest. This is discussed in more detail below.

Since consumption and investment are its largest components, the result for United States GDP is not surprising. Figure 6 shows a familiar Keynesian response from fiscal stimulus. GDP initially expands to be 0.6 per cent above the baseline as government spending gives a sugar-hit to the economy. But the increased issuance of government bonds to finance the increase in government spending soaks-up savings which would otherwise be financing the supply-side of the economy. As a result, the medium-term impact is a reduction in GDP before settling around the baseline in the longer-term.

Much of the transition from this policy, particularly the impact on other countries (the key focus of this paper), can be explained by what happens to interest rates, capital flows and exchange rates. Higher interest rates in the United States results in financial capital flowing into the United States to obtain higher returns. This results in an appreciated real effective exchange rate during the three years of stimulus by around 1.5 per cent above the baseline (Figure 7). Because its exports are now relatively more expensive to those of other countries, an appreciated exchange rate means a weakened trade balance by 0.6 per cent in the first year (Figure 8).

Figure 3: US fiscal deficit

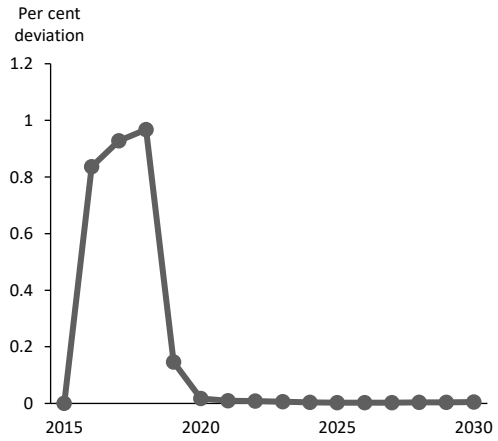


Figure 4: US investment

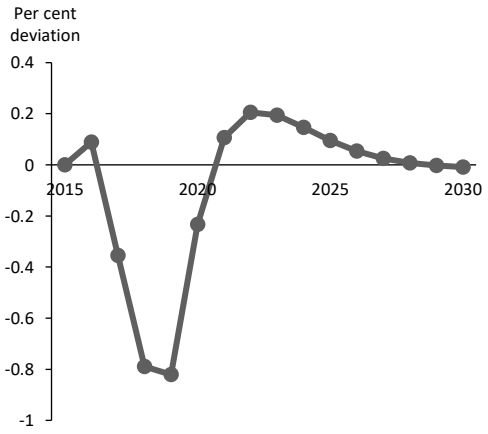


Figure 5: US consumption

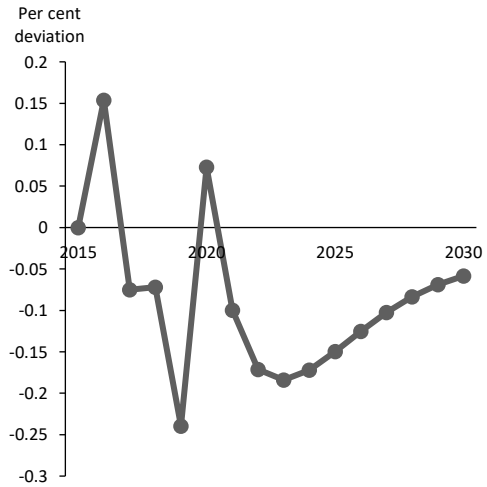


Figure 6: US real GDP

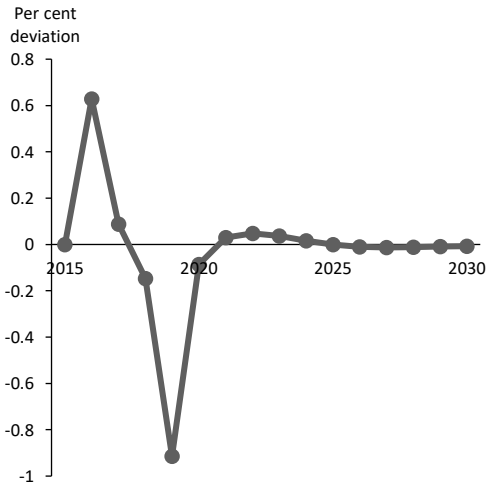


Figure 7: Real effective exchange rate

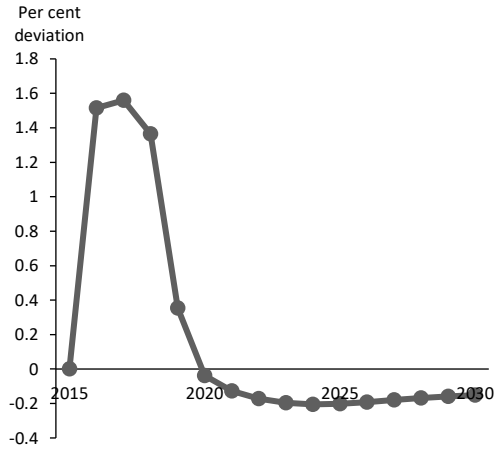
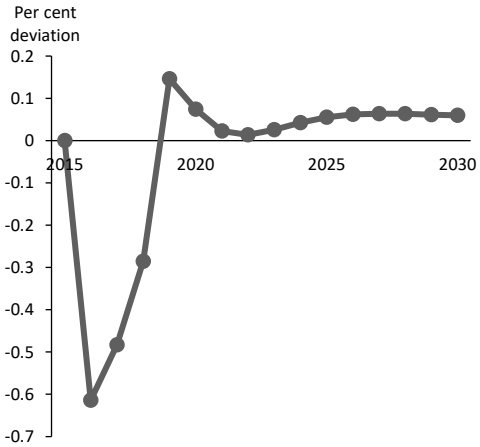


Figure 8: US trade balance



The key issue for coordination is what impact stimulus in the United States has on other G20 countries through exchange rates and demand for imports. An appreciated exchange rate in the United States means a relatively depreciated exchange rate for its trading partners, and some of the increased consumption in the United States falls on imports. Both result in an improved trade balance for the trading partners of the United States, between 0.3 and 0.4 per cent for Mexico and Canada in the first year (Figure 9).

This improvement in their trade balance, however, is partially offset by weaker investment caused by higher global interest rates and capital flight out of their economies into the United States (Figure 10). The overall impact on GDP is therefore similar to that of the United States: A short-term sugar hit to the economy from an improved trade-balance, but a medium-term contraction due to weaker investment (Figure 11).

Figure 9: Trade balance

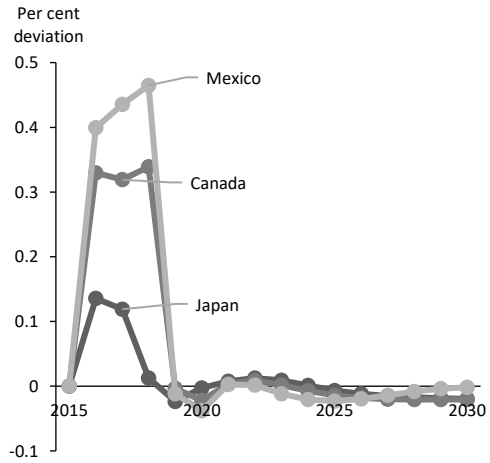


Figure 10: Investment

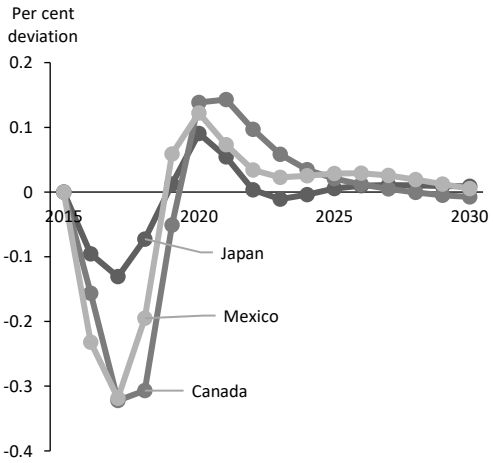


Figure 11: Real GDP

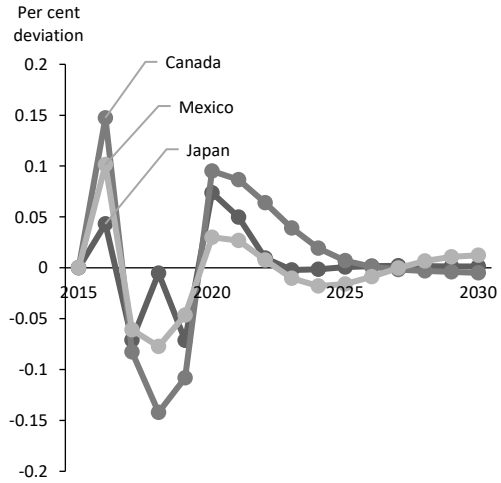
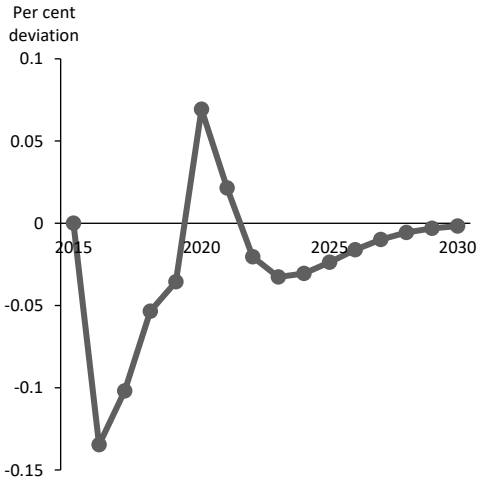


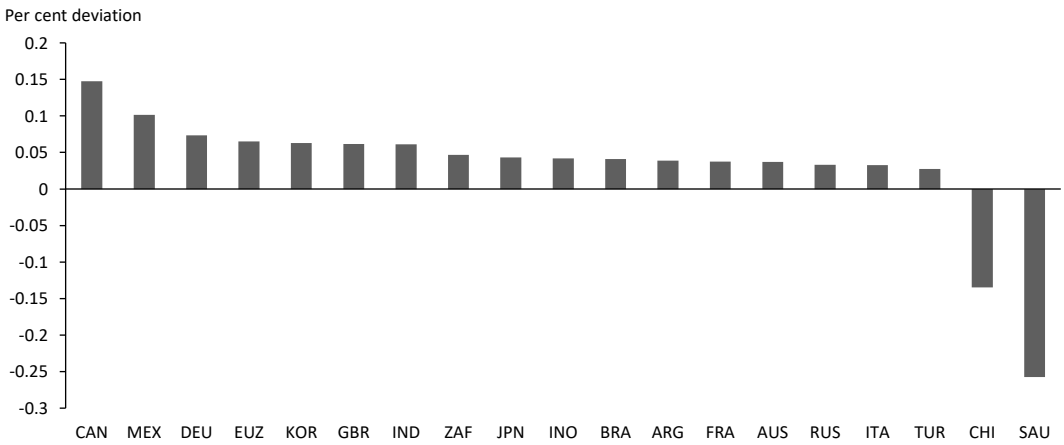
Figure 12: Real GDP in China



Fiscal stimulus in the United States has a differentiated impact across the G20. Figure 13 shows the first-year impacts on each G20 country's GDP. The countries that benefit the most are those with the closest trade links to the United States, such as Canada, Mexico, Germany and Japan. Smaller and more open economies, such as South Africa and Korea, also tend to benefit more than others.

The countries which benefit the least are those with smaller trade-links with the United States. Saudi Arabia and China stand out as special cases. Shown in Figure 12, fiscal stimulus in the United States results in a contraction in Chinese GDP. This is because of China's monetary policy framework. Because China manages its exchange rate against a basket of currencies (heavily weighted towards the US dollar), the appreciation in the US dollar means Chinese authorities must pursue tighter monetary policy in order to maintain the value of its exchange rate. This tighter monetary policy, in turn, causes a larger contraction in economic activity, reducing GDP. This is also the case for Saudi Arabia which maintains a fixed exchange rate against the US dollar. This highlights one of the well-known trade-offs of having a managed exchange rate.

Figure 13: First year impact on each G20 country's GDP from US fiscal stimulus



Now consider the impacts of stimulus when it comes from other G20 countries. In a 20x20 matrix, Table 2 shows the impact of stimulus undertaken unilaterally by each G20 country on its peers. All results show the impact on GDP in the first year that stimulus is undertaken. The country which is stimulating is on the x-axis and the impact on the other G20 countries is on the y-axis. For example, when the US undertakes stimulus on its own, the benefit to US GDP is 0.63 per cent, the benefit to Japan's GDP is 0.04 per cent, the benefit to Germany's GDP is 0.07 per cent, and so on.

The results in Table 2 are consistent with the findings in the literature (Ivanova and Weber, 2009; Ilzetzki et al, 2011; Freedman et al; 2010) and consistent with what would be expected from a gravity model. Countries benefit most when stimulus is undertaken by their major trading partners. The economic impacts of stimulus are also heavily affected by the level of openness of different economies and monetary policy and exchange rate frameworks. The own-benefits of fiscal stimulus in France and Italy, for example, are particularly large. This is because they share a common currency with the rest of the euro zone such that, when they undertake stimulus alone, it has a more muted effect on the exchange rate than is the case for countries which have their own exchange rates. Conversely, when Germany or the rest of the euro zone undertake stimulus, the first-year GDP impact on France and Italy is negative because they suffer the effects of an appreciated euro.

Table 2: How each G20 country benefits from the unilateral stimulus of others (% GDP)

	USA	JPN	DEU	GBR	FRA	ITA	EUZ	CAN	AUS	KOR	TUR	CHI	IND	INO	MEX	ARG	BRA	RUS	SAU	ZAF
USA	**0.63**	0.02	0.02	0.01	0.01	0.01	0.02	**0.01**	0.00	0.01	0.00	0.02	0.01	0.00	**0.01**	0.00	0.01	0.00	**0.00**	0.00
JPN	0.04	**0.43**	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DEU	**0.07**	0.03	**0.26**	**0.02**	-0.07	-0.05	0.00	0.01	**0.01**	**0.01**	**0.01**	**0.04**	**0.01**	0.00	**0.01**	**0.00**	**0.01**	0.00	**0.00**	**0.00**
GBR	0.06	0.01	**0.03**	**0.22**	**0.02**	**0.02**	**0.04**	**0.01**	**0.01**	0.01	0.00	0.03	0.01	0.00	**0.00**	0.00	0.01	**0.01**	**0.00**	**0.00**
FRA	0.04	0.01	-0.17	**0.02**	**0.68**	-0.05	-0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
ITA	0.03	0.01	-0.14	0.01	-0.06	**0.48**	-0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EUZ	**0.06**	0.02	-0.13	**0.03**	-0.06	-0.04	**0.41**	**0.01**	**0.01**	0.01	**0.00**	0.03	**0.01**	**0.00**	**0.00**	**0.00**	**0.01**	0.00	**0.00**	**0.00**
CAN	**0.15**	0.02	0.02	0.01	**0.01**	0.01	0.02	**0.24**	0.00	0.01	0.00	0.03	0.01	0.00	**0.01**	**0.00**	0.01	**0.00**	0.00	0.00
AUS	0.04	**0.03**	0.01	0.01	0.01	0.01	0.02	0.00	**0.26**	**0.01**	0.00	**0.05**	**0.01**	**0.00**	0.00	0.00	0.01	0.00	0.00	**0.00**
KOR	0.06	**0.04**	0.02	0.01	0.01	0.01	0.02	0.01	0.00	**0.10**	0.00	**0.04**	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
TUR	0.03	0.01	0.02	0.01	0.01	0.01	0.02	0.00	0.00	0.00	**0.16**	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHI	-0.13	**0.04**	0.02	0.01	0.01	0.01	0.02	0.00	0.00	**0.01**	0.00	**0.50**	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IND	0.06	0.02	**0.02**	**0.02**	**0.01**	**0.01**	**0.03**	0.01	0.00	0.01	0.00	0.04	**0.27**	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00
INO	0.04	**0.03**	0.01	0.01	0.01	0.01	0.02	0.00	0.00	**0.01**	0.00	0.03	**0.01**	**0.22**	0.00	0.00	0.00	0.00	0.00	0.00
MEX	**0.10**	0.03	0.01	0.01	0.01	0.01	0.01	**0.01**	0.00	0.01	0.00	0.03	0.00	0.00	-0.06	0.00	0.01	0.00	0.00	0.00
ARG	0.04	0.01	0.02	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	**0.26**	**0.03**	0.00	0.00	0.00
BRA	0.04	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	**0.00**	**0.48**	0.00	0.00	0.00
RUS	0.03	0.02	0.02	0.01	0.01	**0.01**	0.02	0.00	0.00	0.00	**0.00**	0.02	0.01	0.00	0.00	0.00	0.00	**0.17**	0.00	0.00
SAU	-0.26	0.02	**0.02**	0.01	**0.02**	**0.02**	**0.03**	0.00	0.00	0.01	**0.00**	0.03	0.01	**0.00**	0.00	0.00	**0.01**	**0.01**	**0.22**	0.00
ZAF	0.05	0.02	**0.02**	0.01	0.01	0.01	**0.02**	0.00	**0.01**	0.01	0.00	**0.04**	0.01	0.00	0.00	0.00	0.01	0.00	0.00	**0.18**

Numbers in red represent the top 5 most significantly impacted economies

Table 2 can be read from left to right to see which countries' stimulus influences each G20 country the most. Australia, for example, benefits most from stimulus when it comes from China, the United States, Japan and Korea – its largest trading partners.

Coordinated stimulus

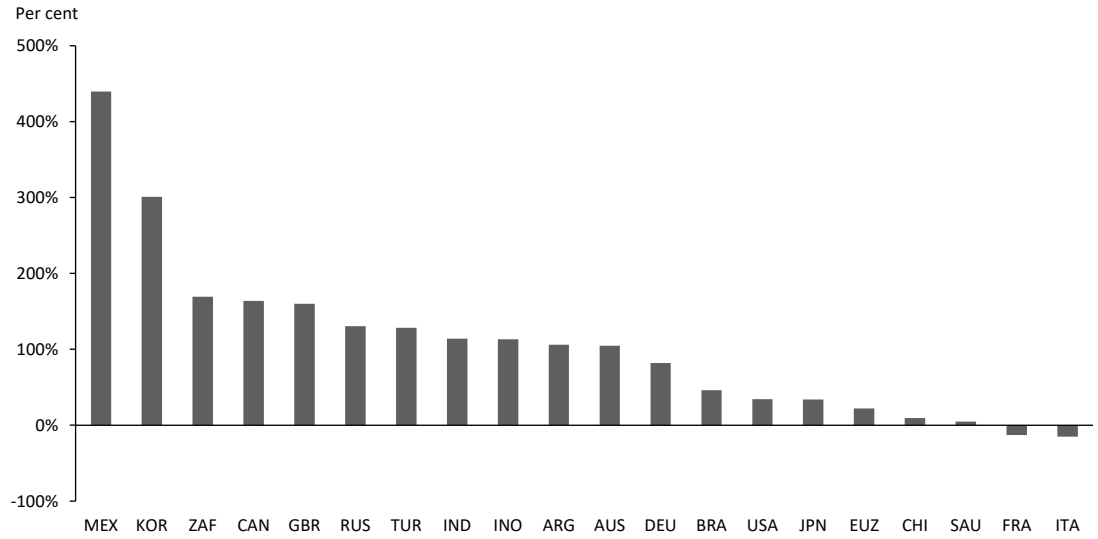
These results suggest there are strong benefits from coordination for most, but not all, G20 countries. On average, the benefit to first-year GDP is twice as large (106 per cent) for G20 countries when they undertake their stimulus together than when they

undertake it alone. But the impacts of coordination differ significantly from one G20 economy to the next.

The benefit of coordination primarily comes from the effect on exchange rates and, to a lesser extent, through increased demand through the import channel. When a country stimulates alone, its exchange rate appreciates which acts to offset some of the benefits of its fiscal stimulus. When countries stimulate together, this exchange rate effect is offset and the effect of stimulus is larger. These effects are partly mitigated by reduced investment from accentuated effects on real interest rates because, with all countries increasing spending at the same time, the demand on global savings is much larger than when a country acts alone.

Figure 14 shows the first-year benefit to GDP from fiscal stimulus for each G20 country when undertaken together compared to when it is undertaken alone. It shows, as a percentage, how much larger (or smaller) the first-year impact on GDP is when stimulus is undertaken together compared to when stimulus is undertaken alone.

Figure 14: How much larger the increase to first year GDP is when stimulus is coordinated (%)



As earlier, the countries which benefit the most from coordination tend to be those with more open economies and which trade more with the rest of the world. This is a logical finding since the primary benefit of coordination is avoiding an appreciated exchange rate. Thus, the more a country trades, the bigger is the benefit of avoiding this appreciated exchange rate and the larger is the benefits of coordination.

The country which benefits the most, and for unique reasons, is Mexico. Capital flows in and out of Mexico tend to be highly sensitive to changes in fiscal policy, so much so that (as in Table 2) Mexico suffers a first-year loss to GDP when it undertakes fiscal stimulus alone. This is caused by much sharper contractions in investment and its trade balance than is the case for other G20 countries. When the rest of the G20 undertakes

stimulus as well, first-year GDP in Mexico increases such that it is significantly better off from coordination.

The economies which benefit little from coordination tend to be the larger economies which are less influenced by the actions of the rest of the world, and those countries which trade relatively less. The economies which lose from coordination tend to be those which have inflexible monetary policy and exchange rate frameworks, namely France, Italy and, to a lesser extent, Saudi Arabia and China. As earlier, France and Italy benefit significantly when they stimulate alone because their common currency with the euro zone means a more muted exchange rate effect. But when the rest of the euro zone stimulates, too, this exchange rate effect partially offsets some of the benefits of stimulus. Hence, they are worse off from coordination.

Saudi Arabia loses from coordination for a similar reason. When it stimulates alone, the impact on its exchange rate is more muted because its exchange rate is pegged to the United States dollar. But when the United States stimulates, too, the United States dollar appreciates, requiring tighter monetary policy from Saudi Arabian officials which, in turn, depresses economic activity in Saudi Arabia. China similarly benefits little, but the benefits of increased demand tend to dominate.

While coordination exacerbates the short-run benefits of fiscal stimulus (for most countries), it also exacerbates the medium-term cost. Coordination results in a steeper medium-term decline in GDP and slightly lower GDP in the long-run relative to the baseline. This is shown in Figure 15 for Canada and Figure 16 for Indonesia. The benefits of coordinated stimulus outlined above therefore presumes policymakers, by implementing stimulus, are more concerned about the short-term than the long-term. The results from in-depth interviews discussed in Section 4 suggests this is a reasonable assumption.

Figure 15: Impact of coordinated versus uncoordinated stimulus on Canada's GDP

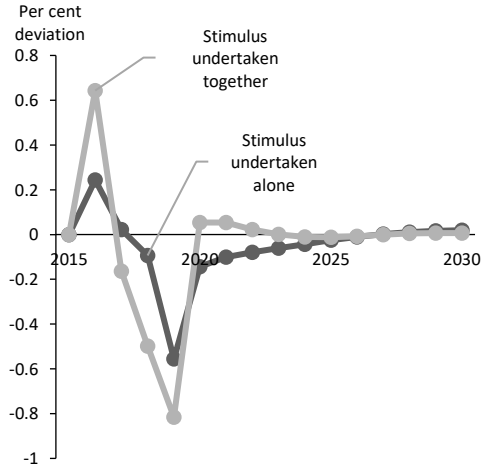
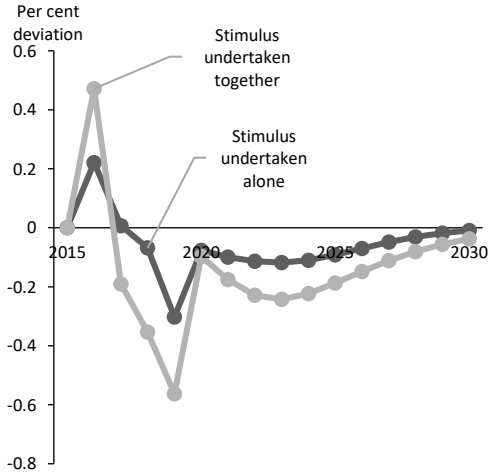


Figure 16: Impact of coordinated versus uncoordinated stimulus on Indonesian GDP



3.3 The role of risk and fiscal sustainability

Many warn that fiscal stimulus can, in certain circumstances, cause negative effects for the economy. These include increased risk premia, reduced confidence, a higher cost of capital and shifts in global trade and financial flows (Veld and Roeger, 2013; Laubach, 2009; Poghosyan, 2012). Others argue these concerns are overstated. Auerbach and Gorodnichenko (2017), for example, found that government spending shocks do not lead to persistent increases in debt-to-GDP ratios or costs of borrowing, especially during periods of economic weakness.

Risk can enter the G-Cubed model in many ways, including for particular assets. Here it is assumed to be through changes in the risk premia for the entire country. This means that investors require an additional return if they are to hold assets in a country that they now judge to be relatively riskier. The change in country risk premia is given through the interest parity equation in the G-Cubed model where the rate of return for any country at any time is equal to the rate of return for the United States, plus any expected exchange rate changes between the two countries, plus the risk premium (see McKibbin and Triggs, 2018).

The literature gives different estimates on the relationship between increased debt and deficits and risk premia (see Ardagna et al, 2004; Laubach, 2009; Poghosyan, 2012). A result which is typical of this literature is from Veld and Roeger (2013). They found that increased debt had no effect on risk for countries with debt-to-GDP less than 60 per cent. But for countries with debt-to-GDP between 60 and 90 per cent, they found that a 10 percentage point increase in debt-to-GDP increased risk premia by 1 per cent. For countries with debt-to-GDP exceeding 90 per cent, they found that a 10 percentage point increase in debt-to-GDP increased risk premia by 2 per cent.

Although some studies disagree with the Veld and Roeger's results, it nevertheless provides a starting point. The results can then be scaled according to alternative estimates. Applying these findings in a linear fashion to G20 countries suggests that a 1 per cent increase in spending for three years will have the effects on country risk listed in Table 3. Most countries experience no change because their debt-to-GDP is under 60 per cent. Some countries experience a moderate increase in risk because their debt-to-GDP is between 60 and 90 per cent. Others experience a large increase in risk because their debt-to-GDP is over 90 per cent of GDP. A stylised graph of the relationship identified by Veld and Roeger (2013) is shown in Figure 17.

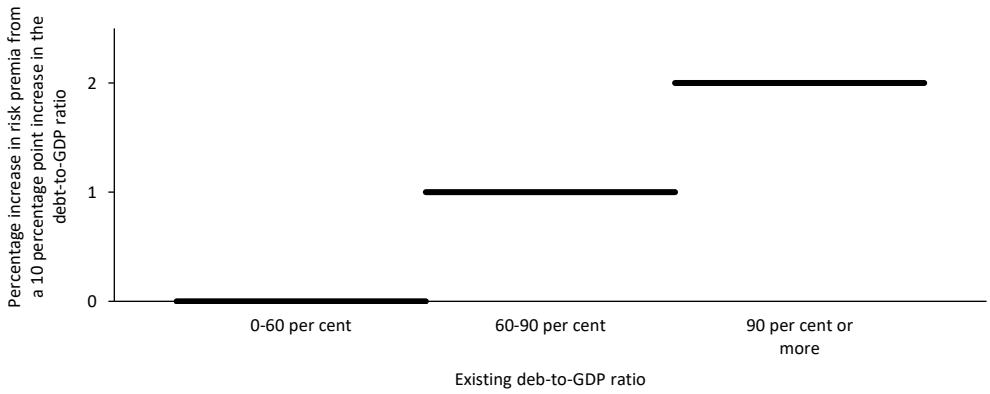
In some respects, Table 2 includes an unusual selection of countries. Other than Brazil and India, the countries captured by this methodology are the advanced economies which are typically treated by markets as being safe havens rather than the source of risk. The ways in which the results differ when risk is applied to the emerging market economies is considered at the end of this section.

Table 3: Cumulative percentage increases in country risk premia from fiscal expansion

	Year 1	Year 2	Year 3 and beyond
Argentina	0	0	0
Australia	0	0	0
Brazil	0.01	0.02	0.03
Canada	0.02	0.04	0.06
China	0	0	0
France	0.02	0.04	0.06
EU	0.01	0.02	0.03
Germany	0.01	0.02	0.03
India	0.01	0.02	0.03
Indonesia	0	0	0
Italy	0.02	0.04	0.06
Japan	0.02	0.04	0.06
Korea	0	0	0
Mexico	0	0	0
Russia	0	0	0
Saudi Arabia	0	0	0
South Africa	0	0	0
Turkey	0	0	0
United Kingdom	0.02	0.04	0.06
United States	0.02	0.04	0.06

Source: Calculations based on Veld and Roeger (2013) and IMF World Economic Outlook database, Oct 2017

Figure 17: The assumed increase in risk premia from a 10 percentage point increase in debt-to-GDP for economies, based on their existing debt-to-GDP ratio



Source: Calculations based on Veld and Roeger (2013)

The effect of an increase in risk in the G-Cubed model is to cause a global reallocation of capital. Because investors perceive these economies to be riskier than before, they are less willing to hold assets in those countries. Because of this risk reappraisal, capital pours out of the economies which now have higher risk to obtain higher (risk-adjusted) returns elsewhere. Importantly, this increase in risk is assumed to be staggered, but permanent. Risk increases as debt increases but remains elevated for the rest of time. This has important implications for forward-looking agents who might otherwise change their behaviour in anticipation of the risk-shock subsiding (see McKibbin and Stoeckel, 2009).

This increase in risk acts to offset some of the effects of fiscal stimulus in those economies. While the effect of fiscal stimulus is to draw-in capital, the effect of increased risk is to push capital out. The net impact, for most countries, is to only slightly reduce GDP. The contrast is shown for two relatively indebted countries – Canada and Japan – in Figures 18 and 19. For Canada, the effect of increased risk is comparatively small, a result which is typical for most countries. For Japan, given it has the largest stock of debt in the G20 by some margin, the effect is significant.

Figure 18: Stimulus with increased risk versus without – Canada

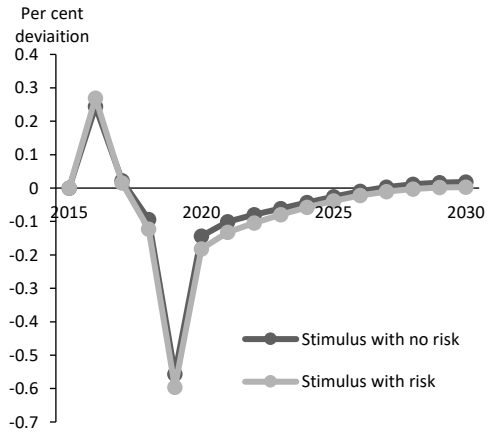
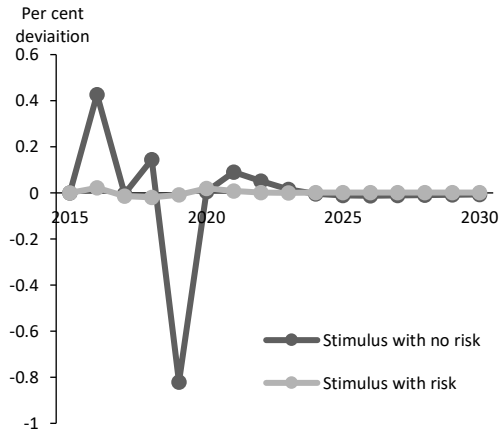


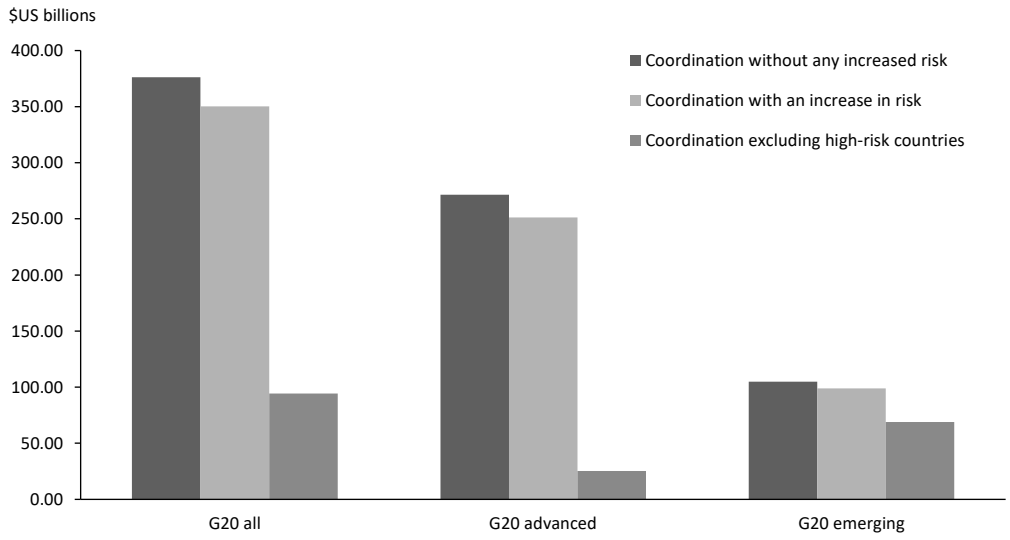
Figure 19: Stimulus with increased risk versus without - Japan



The critical question in thinking about future crises is whether we would want countries with relatively high levels of debt to still participate in coordinated stimulus given it results in an increase in risk in the global economy.

The results suggest the answer is yes. Excluding relatively indebted countries from coordinated stimulus would exclude 10 of the largest G20 countries. Having these countries not undertake stimulus results in the first-year aggregate boost to G20 GDP being less than a third of what it is compared to when they stimulate, too. While having these relatively indebted countries undertake stimulus causes an increase in risk in the global economy, the cost of excluding these economies from coordinated stimulus is larger than the cost of the increased risk (Figure 20).

Figure 20: The first-year impact of G20 GDP from stimulus: without risk, with risk and excluding the high-risk countries



There are two areas in this analysis which warrant further consideration. The first is what would happen if it was the emerging market economies, rather than the advanced economies, which suffered the increase in risk. When this scenario is modelled, the results above are essentially reversed – capital is reallocated in favour of the advanced economies because they have lower risk premia. The effects on the benefits of coordination, however, are not changed. Countries are still better off acting together than alone.

The second issue is whether coordination itself could reduce risk and boost confidence. Many G20 politicians and officials argued that coordinating stimulus during the global financial crisis acted to boost confidence and reduce risk by reassuring markets that countries were acting and working together (see Section 4). If true, this would mean that risk is lower because of coordination which would further increase the benefits of coordination.

4. Coordination or coincidence? Does the G20 influence domestic fiscal expansions?

The above results suggest that countries have an incentive to undertake stimulus regardless of what other G20 countries are doing. Given this, it is reasonable to question whether the fiscal expansions by G20 countries from 2008 to 2010 were genuinely coordinated or whether countries were simply moving in the same direction given they faced a common shock. The answer to this question is critical to understanding both the usefulness of coordination agreements in the first place, and for designing coordination agreements in the aftermath of Covid-19.

> It depends on how you define coordination. In response to a sound everyone turns their head. We might say 'oh look, everyone coordinated in turning their heads' but in reality it was a similar response to a common shock. During the crisis, some countries would have had a similar fiscal policy response regardless of the G20 - *Phil Lowe, Governor of the Reserve Bank, Australia, interviewed 29 April 2017.*

On the question of whether coordination was genuine or not, much of the G20's fiscal expansion can be immediately ruled-out. Automatic stabilisers accounted for 36 per cent of the overall expansion which, as the name suggests, occur automatically. The same is true for another 30 per cent of the total expansion which was from spending unrelated to the crisis (mostly defence spending) (IMF, 2009).

For the remaining 34 per cent, although authors question whether the G20 played a coordinating role or not, there has been no conclusive study which has answered this question. Helleiner (2014) used an event analysis to explore whether the G20's agreement on coordinated fiscal stimulus influenced the domestic policies of China. He noted that China's fiscal stimulus package was announced before the leaders G20 meeting in 2008 and therefore concluded that the G20 did not have an effect (see also Wade, 2011).

There are several reasons to sceptical of this conclusion. Fiscal stimulus, after all, was not a one-year event – it was a process which persisted from 2008 to 2010 (and sometimes longer). Many countries, including China, not only had multiple stimulus packages but were also constantly assessing how long they should keep stimulus going. Furthermore, the majority of the G20's agenda is agreed and delivered before the leaders meeting in the dozens of meetings of ministers and officials throughout the year. The G20 also represents a 'repeat game' where policymakers slowly chip away at an issue until a consensus is reached.

This paper therefore adopts a different approach. There is only one *ex ante* transmission mechanism between the G20 and the domestic policies of its members, and that is the policymakers themselves. If policies are directly influenced by the G20, it is because the politicians and officials who attended those meetings changed the domestic policies of their country because of what was agreed and discussed.

In-depth interviews were undertaken with 61 leaders, central bank governors, ministers and officials from across all G20 countries. These are the individuals who make up the G20 and are responsible for shaping the policies in their countries. The below findings are testament to the generosity and openness of these policymakers in discussing their experiences in global economic cooperation. Participants included Kevin Rudd, Janet Yellen, Haruhiko Kuroda, Ben Bernanke, Jack Lew, Mark Carney and 55 other politicians and officials to whom I am deeply grateful. The methodology used for this research and a breakdown of the sample is extracted to Appendix A.

4.1 Does the G20 influence fiscal policy expansions?

The interviews conducted for this research suggests it is wrong to say that countries' fiscal policies are determined by the G20, but it is also wrong to say that the G20 has no influence over domestic fiscal policies. The interviews found that the G20 does influence fiscal policy expansions. But the extent of this influence appears to vary across four critical dimensions:

- The relative size of the economy: smaller economies reported being more influenced by the G20 than larger ones.
- The level of development: G20 emerging market and developing economies reported being more influenced by the G20 than advanced economies.
- The state of the economy: perhaps unsurprisingly, all economies reported being much less likely to expand fiscal policies because of a G20 agreement outside of a crisis.
- The extent to which policymakers are convinced of the benefits of coordination: policymakers who are sceptical of the economic benefits of coordination reported their country being less influenced by any coordination agreements.

Eleven of the G20 economies reported that they undertook more fiscal stimulus from 2008 to 2010 because of the G20 than they otherwise would have done (Figures 22 and 23). For some countries, the increase in stimulus was substantial – up to half a per cent of GDP – while for others it was more marginal.

> The G20 played a positive role in the quantum of Australia's fiscal stimulus. We could deploy the argument in domestic politics that the world was undertaking a similar approach. The discussion also reinforced for many countries the enormity of the crisis facing the global economy. I know from private conversations that a number of countries undertook more stimulus because of discussions and agreements at the G20 – *Kevin Rudd, 26th Prime Minister of Australia, interviewed 8 September 2017.*
>
> The G20 collective action and the IMF statements made it easier for Australia to do 2 per cent of GDP worth of stimulus - *Gordon de Brouwer, former Sherpa, Australia, interviewed 23 February 2017.*
>
> The fact we had international consensus made it much easier for governments to undertake deficit spending - *Simon Kennedy, former Sherpa, Canada, interviewed 3 August 2017.*
>
> We probably would have undertaken the same measures, but the level of urgency, confidence and quality would be lower - *Mahendra Siregar, former Sherpa, Indonesia, interviewed 22 May 2017.*
>
> For stimulus, yes. Absolutely we did more, as did others. Leaders understood the degree of uncertainty better because they were sharing notes more than if they sat at home in their countries. They were a lot more aware of the spillovers between each other so they were more willing to do more as a consequence - *Martin Parkinson, Secretary of the Department of the Prime Minister and Cabinet, Australia, interviewed 30 May 2017.*
>
> There was a lot of urging on us by our international partners for us to do more given our sound fiscal position – to use that space – and we listen to our international partners. We have also provided a lot of funding through the IMF and through capital increases for the MDBs. That for sure would not have happened without the G20. It also went almost unnoticed in the wider

public that the MDBs created several dedicated facilities, for infrastructure financing for example, and this funding would not have been made available without the G20, or was at least significantly increased because of the G20 - *Holger Fabig, senior G20 official, Germany, interviewed 7 April 2017.*

The relative size of economies appears to make a difference (Figure 22). Divided between large and small,[4] 70 per cent of smaller economies said their fiscal expansions were larger because of the G20 compared to just 40 per cent of larger economies. Emerging market economies were also slightly more likely to have been influenced by the G20 than advanced economies: 60 per cent compared to 40 per cent (Figure 23).

> Stimulus was not really coordinated, at least not from the US perspective. Countries may have changed their behaviour because of the G20 a little bit, there was a shared imperative and coincidence of interest. I think the forum was less important than the imperative – *Former senior official, United States, interviewed 12 September 2017.*

> The fiscal commitments we made in 2014 reflected what we were trying to do anyway. In terms of outcomes, we eased up on some tax provisions, and reached a short-term agreement on annual appropriations – but I don't think it was principally because of the G20. Those things had their own domestic momentum – *Jacob Lew, former Treasury Secretary, United States, interviewed 7 September 2017.*

> No coordination was required, as every country wants to pump up its economy to the extent possible: the G20 leaders were pushing on an open door when they called for coordinated stimulus – *Raghuram Rajan, former Central Bank Governor, India.*

Figure 22: The G20's influence on fiscal stimulus: large and small economies

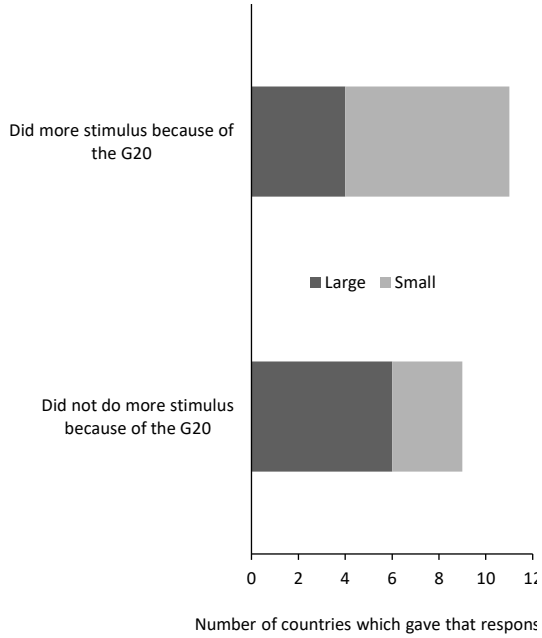
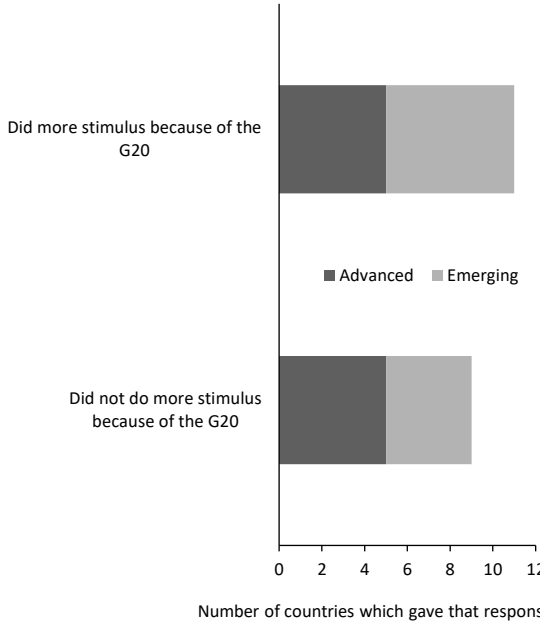


Figure 23: The G20's influence on fiscal stimulus: advanced and emerging economies



[4] Ranked by GDP (PPP), large countries are classified as China, the EU, the United States, India, Japan, Germany, Russia, Indonesia, Brazil and the United Kingdom.

The G20 appears to have more influence over domestic fiscal policy settings during a crisis than outside of a crisis, and when economies are facing a symmetric, or shared, challenge. This was highlighted by comparing two periods in which the G20 pushed for expansive fiscal policies: in 2008 (as part of crisis-response) and from 2013 to 2017 (as part of a move, led by the United States, for more 'growth friendly' fiscal policies). Policymakers suggest the G20's influence over fiscal expansions was much weaker outside of a crisis.

> I don't think any of us put out commitments we didn't believe, but I can tell you that a lot of the commitments from the United States were things that required Congress to act, and we knew that would be difficult. The G20 can help drive domestic systems towards moving ahead on difficult matters, but in the end, it takes either a groundswell of domestic support or a crisis to get some of those policies through – *Jacob Lew, former Treasury Secretary, United States, interviewed 7 September 2017.*

> The opposition to fiscal stimulus during a crisis is much weaker than outside of a crisis - *Senior G20 official, Italy, interviewed 18 February 2017.*

> During the crisis, fiscal policy coordination delivered a desirable outcome. Although such coordination has been less observed since then, it is not because the G20's influence has weakened but because it is less clear nowadays whether such degree of policy coordination is needed as we are out of the crisis and cyclical positions of each country are less synchronised – *Chang Yong Rhee, former Secretary General and Sherpa of the Presidential Committee for the 2010 G20 Seoul Summit, Republic of Korea, interviewed 17 August 2017.*

> It was coordinated from 2008 to 2010 because everyone was in the mess together. Whether in a more complex set of circumstances you could get a coordinated outcome like that I don't know - *Wayne Swan, former Treasurer, Australia, interviewed 21 March 2017.*

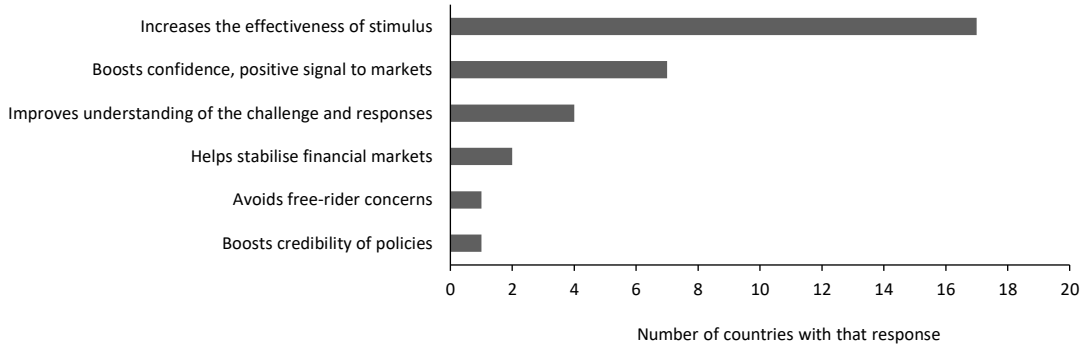
> The idea of coordinated stimulus has become more contentious because fiscal positions have deteriorated and debt is high. If you had a repeat GFC today you might get other countries not agreeing to coordinated stimulus - *Central Bank official, advanced economy, interviewed 17 August 2017.*

Why does the G20 influence domestic fiscal expansions?

Policymakers identified a range of interrelated economic and political benefits which they perceived to come from coordinated fiscal expansion. These benefits ultimately underpinned the decision-making in their countries.

When asked about the economic benefits from participating in coordinated stimulus (Figure 24), the most common response was that fiscal stimulus results in positive spillovers between countries. Having more countries undertaking fiscal stimulus resulted in a whole which was greater than the sum of its parts, as demonstrated in the modelling above.

Figure 24: What policymakers perceive to be the economic benefits of coordinated fiscal stimulus



Policymakers said that coordination was also important because it boosted market confidence or sent a positive signal to the markets, helped them to better understand the nature of the problem and how other countries were going to react. It boosted the credibility of their commitments to markets and helped prevent other countries from free-riding on their fiscal expansions.[5]

> Coordination was crucial to avoiding beggar-thy-neighbour policies - *Senior G20 official, Italy, interviewed 18 February 2017.*

> The collective action and its size and timing were very important to shift market sentiment. It is often not only the size of fiscal stimulus but the effect of political awareness and identification of the right measures which have a significant impact on boosting confidence - *Senior central bank official, emerging market economy, interviewed 17 May 2017.*

> A real benefit of having that stimulus was that we learned from the lessons of other countries and the importance of keeping stimulus measures prudent – not to create unnecessary future fiscal risk. That was very important. We were able to learn from what other countries were doing in the G20 – *Mahendra Siregar, former Sherpa, Indonesia, interviewed 22 May 2017.*

> It was a strong signal of international cooperation which boosted confidence and reassured businesses and the public that governments were able to act. Put quite simply, but it is true – I think the world needs to see pictures of world leaders coming together in difficult times, to see that these people do actually come together, they do talk to each other and they do reach significant conclusions. That in itself is a very powerful message for the global economy. This is vital for confidence - *Holger Fabig, senior G20 official, Germany, interviewed 7 April 2017.*

Fifteen of the 20 countries felt that there were also political benefits to their country from having fiscal stimulus coordinated, although many noted that the political and economic benefits can be difficult to disentangle:

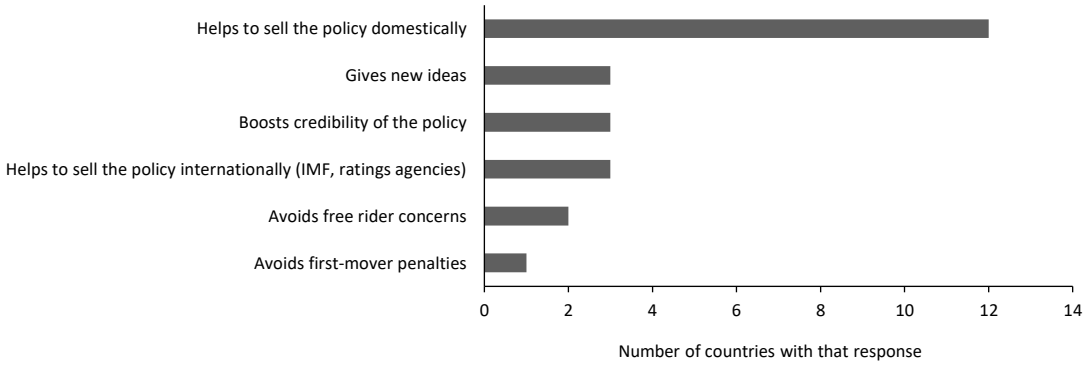
> Political and economic advantages can go hand-in-hand. Boosting the credibility of a policy is good for politics but also makes the policy more effective through increased business and household confidence - *Gordon de Brouwer, former Sherpa, Australia, interviewed 23 February 2017.*

The primary political benefit (Figure 25) was that it helped sell the policy domestically and bolster the credibility of their policy to a domestic audience. It also helped calm

[5] The numbers in parentheses do not sum to 100 because most countries gave multiple reasons for their answer.

concerns among the public that other countries might be free riding on their country's efforts. It gave them policy ideas, it gave them support around political messaging, it helped them to avoid international political pressures from credit rating agencies and international organisations which might otherwise disapprove of expansive fiscal policy (particularly for emerging economies) and it helped them avoid political pressure from being a global 'first mover'.

Figure 25: How the G20 influences domestic fiscal stimulus



To be honest, it helped sell the stimulus domestically but also to explain to the luddites in the Opposition that we weren't being Robinson Crusoe on this. Making the case for stimulus was aided by the magnitude of the collective actions from other countries, embraced in the London communique - *Kevin Rudd, 26th Prime Minister of Australia, interviewed 8 September 2017.*

It was definitely easier to do stimulus in Indonesia because of the G20. This was the opposite of the situation in 1998 when the IMF's recommendations were to pursue tighter fiscal policy during a crisis. We focused on tax cuts and increased spending on social assistance - *Muhamad Basri, former Finance Minister, Indonesia, interviewed 6 November 2017.*

In Argentina, the G20 helped with the politics of stimulus. We could say that "what we are doing is also supported by the G20" which showed that we were not alone putting in place fiscal stimulus policies - *Cecilia Nahón, Former Sherpa, Argentina, interviewed 2 October 2017.*

Korea undertook fiscal stimulus in 2008 and 2009, and the supplementary budget was relatively smoothly passed in the Parliament as the other G20 members committed to such stimulus as well - *Chang Yong Rhee, former Secretary General and Sherpa of the Presidential Committee for the 2010 G20 Seoul Summit, Republic of Korea, interviewed 17 August 2017.*

The G20's coordinated actions provided vital political cover for some governments who might have otherwise had domestic constituency concerns - *Wayne Swan, former Treasurer, Australia, interviewed 21 March 2017.*

It helped sell the policy globally. It allowed fiscal stimulus without attracting negative attention from the credit rating agencies, the IMF and other similar bodies. Coordination made fiscal stimulus more respectable - *Arvind Mayaram, former finance deputy, India, interviewed 7 June 2017.*

Coordinated stimulus was used politically by all countries. The coordination legitimised their domestic stimulus - *Hugo Gobbi, former sous sherpa, Argentina, interviewed 12 May 2017.*

> The concern of fiscal leakages to other countries certainly played out in Australia. If people spent their stimulus cheques on plasma TV's, well, we don't make plasma TV's in this country - *Gordon de Brouwer, former Sherpa, Australia, interviewed 23 February 2017.*

The countries which found there were no political benefits, again, tended to be larger economies. The most common reasons were that domestic considerations simply trumped any international considerations, there was weak domestic opposition to stimulus in the first place or, for several EU countries, that fiscal rule and discussions in the EU dominated any influence from the G20. Domestically-legislated fiscal rules, such as that in Indonesia, also played a critical role.

> The G20's actions on stimulus didn't really help us politically. But the US has complicated politics. Most Americans, and many in Congress, are proudly indifferent to what the rest of the world thinks - *Former senior official, United States, interviewed 12 September 2017.*

> I tried as best I could to use the G20 as an additional reason for domestic action in the US. But the American system is hard to drive that way, and you need to be careful in how you make the case. In the United States, there can be a backlash if you make the argument that you're doing something to comply with international rules rather than as a domestic choice. But the consensus from the G20 was not unwelcome – it certainly helped in getting action from other countries – *Jacob Lew, former Treasury Secretary, United States, interviewed 7 September 2017.*

> For whatever reason, India rarely uses international agreements to leverage or justify changes in domestic policy. Partly, I think, this is a long shadow from the history of imperial colonisation in India – *Montek Ahluwalia, former Sherpa, India, interviewed 10 June 2017.*

> The G20's focus on fiscal stimulus and consolidation had limited impact domestically because of Indonesia's fiscal rule: the deficit cannot exceed 3 per cent – otherwise the President can be impeached - *Muhamad Basri, former Finance Minister, Indonesia, interviewed 6 November 2017.*

5. Conclusion: From 2009 to Covid-19

Just 12 years since the start of the global financial crisis, world leaders once again found themselves implementing substantial fiscal stimulus packages to support their economies. But there is still much we can learn from the G20's coordinated fiscal stimulus from 2008 to 2010. How big are the benefits of coordinated fiscal stimulus? How do those benefits vary between countries? Do countries genuinely coordinate by changing their domestic policies in response to a global fiscal agreement? Should heavily indebted countries participate in fiscal stimulus?

This paper explored these questions using data analysis, a new computable general equilibrium model and in-depth interviews with 61 politicians and officials from across all G20 countries. The paper found that most countries are significantly better off stimulating together than stimulating alone. On average, the first-year GDP gain from fiscal stimulus is twice as large if stimulus is undertaken along with all other G20 countries than if it is undertaken alone.

But not all countries benefit from coordination. The countries that are more open to international trade and finance and have more market-determined exchange rates tend

to benefit the most. Economies that are relatively closed will tend to be more indifferent between undertaking stimulus alone compared to having it coordinated across the G20. Economies that do not have market determined exchange rates or that share an exchange rate with other countries tend to lose because of coordination. The interactions of exchange rates, interest rates and capital flows mean that these countries would generally prefer to stimulate alone rather than stimulate with the rest of the G20. These countries, however, are in the minority.

There has been scepticism about whether countries did more stimulus because of the G20, but research has not been able to reach a robust conclusion one way or the other. Through in-depth interviews with 61 politicians and officials from across the G20, the paper found that more than half of G20 countries undertook more stimulus because of the G20 than they otherwise would have done. Relatively smaller economies were more likely to undertake more stimulus because of the G20 than was the case for larger economies. Emerging market economies also appear to be more influenced by the G20 than advanced economies.

The paper explored the many reasons why this influence exists. It found that G20 coordination gives policymakers a bigger bang-for-their buck. It can also help them to sell the policy domestically. It can bolster the credibility of their policy to a domestic audience. It can help them calm concerns among the public that other countries might be free riding on their country's efforts. It can give them policy ideas, give them support around political messaging and help them to avoid international political pressures from credit rating agencies and international organisations which might otherwise disapprove of expansive fiscal policy.

The paper found that different countries will use the G20 differently. While the G20 may offer little economic or political benefit to politicians and officials in larger economies, it can significantly help policymakers in smaller economies. Understanding how different countries use the G20, both economically and politically, is critical to shaping an effective G20 agenda.

Finally, the paper looked at what effect an increase in risk premia would have if heavily-indebted countries were to undertake stimulus. It found that having relatively indebted countries undertake stimulus reduces the overall benefits of coordinated stimulus. But the cost of excluding these economies from coordinated stimulus is larger than the cost of increased risk.

In responding to the Covid-19 pandemic, these results underscore the importance of the G20 setting clear, public targets for coordinated fiscal stimulus, rather than merely reporting what countries are already doing. Larger G20 countries are less likely to do additional stimulus as a result, but this is not the case for smaller G20 economies and G20 emerging economies. A coordination agreement could not only result in these governments undertaking more stimulus, it could provide them with important political cover and other political benefits in undertaking necessary actions domestically.

Attachment A – In-depth interviews methodology

The following is extracted from Triggs (2019):

> The population for this research – referring to the group that the research intends to generalise its findings across – is summarised in Table A1. It can be organised by G20 stream (left to right) and by seniority (top to bottom), multiplied by 20 countries. The objective of this research was to interview the most senior policymakers possible in each G20 stream from each G20 country. This implies a total sample of 60 individuals. This minimises bias by ensuring representation across all countries and streams of the G20 given different streams often have different areas of responsibility and expertise.

Table A1: The theoretical population for the research

Leaders stream	Finance ministers stream	Central bank governors stream
Leaders	Finance ministers	Central bank governors
Sherpas (advisors to leaders)	Finance deputies	Central bank deputies
Sous-Sherpas	Finance deputy deputies	Central bank deputy deputies
Other officials	Other officials	Other officials

> In total, 61 policymakers were interviewed. Table A2 shows the size of the sample and how it is distributed across countries and workstreams. The identities of the policymakers who participated in this research are confidential, except for where they have been directly quoted. All quotes have been approved by those to whom they are attributed.
>
> There are debates in the literature on the appropriate sample size when undertaking in-depth interviews, but a sample of 61 is more than adequate given the specialised nature of this research and the unique position of the policymakers.[6]
>
> Although interviewing multiple policymakers within a country is vital to reducing potential bias (see Baxter and Eyles (2010) on the importance of 'triangulation') the downside is that some countries are overrepresented in the sample (E.g. Australia). To address this, the accounts of policymakers are aggregated by country. Aggregation, however, requires that there be no significant disagreement between the policymakers within a country. This turned out to the be the case. It was only in rare circumstances that the accounts of policymakers differed within the same country. Where inconsistencies did arise,

[6] As summarised by Dorkin (2012), the concept of 'saturation' is the most important guide in determining the appropriate sample size (see also Mason, 2010). Saturation is defined as the point at which the data collection process no longer offers any new or relevant data or "when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of your core theoretical categories" (Charmaz, 2006, p. 113). Many factors are important in determining the appropriate size of a sample, including the quality of data, the scope of the study, the nature of the topic, the nature of the individuals being interviewed, the amount of useful information obtained from each participant and the qualitative method and study designed used (Morse, 2000).

they were addressed through follow-up conversations and through a weighting system based on the policymaker's area of expertise (e.g. monetary policy), the time in which they served and their seniority.[7]

Table A2: Sample distribution for the interviews of G20 politicians and officials

		G20 work stream		
Country	Total	Leader	Finance	Central bank
Argentina	2	2		
Australia	9	4	3	2
Brazil	1			1
Canada	3	1	1	1
China	2	1		1
European Union	3	1	1	1
France	2	1		1
Germany	3	1	1	1
India	3	1	1	1
Indonesia	2	1	1	
Italy	4	1	1	2
Japan	2			2
Mexico	1	1		
Korea	2		1	1
Russia	3	1	1	1
Saudi Arabia	1	1		
South Africa	3	1	1	1
Turkey	2	1		1
United Kingdom	7	2	2	3
United States	6	2	2	2
Total	61	23	16	22

Finally, a challenge of any qualitative research is in standardising the data so that it can be reported in a way that is accurate but also digestible. This paper uses the commonly used technique, detailed by Dicicco-Bloom and Crabtree (2006), referred to as an 'editing approach'. This is where the investigator reviews and

[7] First, the accounts of policymakers who worked within the relevant G20 work-stream were given preference over the accounts of policymakers who did not work in that policy stream. The accounts of central bank governors, for example, were given greater weight on the topic of monetary policy than the accounts of Sherpas. Second, the accounts of policymakers who worked on the G20 at the time that an issue was discussed were given preference over the accounts of policymakers who did not work on the G20 at that time. For example, the accounts of finance ministers who were present for the fiscal stimulus discussions in 2009 were given preference over the accounts of finance ministers who worked on the G20 at a later date. Third, the accounts of more senior policymakers were given preference over the accounts of less senior policymakers. The view of a central bank governor, for example, was given preference over the view of a central bank deputy.

identifies themes and text segments much as an editor does in organising text.[8] This allows the results, reported in the sections that follow, to be partially standardised, complemented with direct quotes to flesh out what policymakers meant by their responses.

[8] A team from Ontario, Canada used this strategy to apply more than 100 codes in a study to understand the smoking experience and cessation process (see Dicicco-Bloom and Crabtree, 2006).

References

Ardagna, S., Caselli, F. and Lan, T. (2004). Fiscal discpline and the cost of public debt service: some estimates for OECD countries. European Central Bank. Working Paper series. No.411. November 2004. https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp411.pdf?88147661e1eb6755d78df44bc193ba39.

Auerbach A.J. and Gorodnichenko Y. (2012). Output spillovers from fiscal policy. NBER Working Paper Series. Working Paper 18578. November. Cambridge, MA. http://www.nber.org/papers/w18578.

Baxter J. and Eyles J. (2010). The utility of in-depth interviews for studying the meaning of environmental risk. The Professional Geographer. Vol. 51. 1999-Issue 2. pp. 307-320. http://onlinelibrary.wiley.com/doi/10.1111/0033-0124.00167/abstract.

Bayoumi T., Dell'Ariccia G., Habermeier K., Mancini-Griffoli T., Valencia F. and an IMF Staff Team (2014). Monetary policy in the new normal. International Monetary Fund staff discussion note. SDN/14/3. April, Washington DC. https://www.imf.org/external/pubs/ft/sdn/2014/sdn1403.pdf.

Blanchard, O. (2019). Public debt and low interest rates. American Economic Review. Volume 109, Issue 4 (April 2019), pp. 1197-1229. https://www.aeaweb.org/articles?id=10.1257/aer.109.4.1197.

Charmaz K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. London: Sage Publications.

Congressional Budget Office (2017). Summary of deficit effects. Washington D.C. December. https://www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/53362-summarysenatereconciliation.pdf.

Corsetti G., Meier A. and Muller G.J. (2010). Cross-Border Spillovers from Fiscal Stimulus. International Journal of Central Banking. Volume 6, Issue 1, pp.5-37. http://www.ijcb.org/journal/ijcb10q1a1.htm.

DiCicco-Bloom B. and Crabtree B.F. (2006). The qualitative research interview. Medical Education. Vol. 40. Issue 4. Blackwell Publishing Ltd. http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2929.2006.02418.x/abstract.

Dorkin S.L. (2012). Sample size policy for qualitative studies using in-depth interviews. Archives of Sexual Behavior, December 2012, Vol 41, Issue 6, pp. 1319-1320.

Freedman C., Kumhof M., Laxton D., Muir D. and Mursula S. (2010). The case for global stimulus. Journal of Monetary Economics. Volume 57 (2010) pp.506-526. https://www.imf.org/external/pubs/ft/spn/2009/spn0903.pdf.

Furman, J. and Summers, L.H. (2019). Who's afraid of budget deficits? Foreign Affairs. March/April 2019. https://www.foreignaffairs.com/articles/2019-01-27/whos-afraid-budget-deficits

G20 (2009). G20 Leaders communique. London, 2 April. http://www.g20.utoronto.ca/summits/2009london.html.

G20 (2020). G20 leaders communique. Riyadh. 26 March. http://www.g20.utoronto.ca/2020/2020-g20-statement-0326.html

Helleiner, E. (2014). The Status Quo Crisis: Global Financial Governance After the 2008 Meltdown. Oxford University Press, Jun 19, 2014.

Ilzetzki E., Mendoza E.G. and Végh C.A. (2011). How Big (Small?) are Fiscal Multipliers? International Monetary Fund Working Paper WP/11/52. March, Washington DC. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/How-Big-Small-are-Fiscal-Multipliers-24699.

IMF (2009). Update on fiscal stimulus and financial sector measures. Washington DC, 26 April. http://www.imf.org/external/np/fad/2009/042609.pdf.

International Labour Organisation (2010). A review of global fiscal stimulus. International Labour Organisation. International Institute for Labour Studies. Geneva, Switzerland. http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_194175.pdf.

Ivanova A. and Weber S. (2011). Do fiscal spillovers matter? International Monetary Fund Working Paper. WP/11/211. September, Washing DC. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Do-Fiscal-Spillovers-Matter-25213.

Laubach, T. (2009). New evidence on the interest rate effects of budget debt and deficits. Journal of the European Economic Association. Volume 7. Issue 4. June 2009. Pages 858–885. http://onlinelibrary.wiley.com/doi/10.1162/JEEA.2009.7.4.858/abstract.

Mason M. (2010). Sample size and saturation in PhD studies using qualitative interviews. Forum: Qualitative Social Research, 11(3) [Article No. 8].

McKibbin, W. and Fernando, R. (2020). Global Macroeconomic Scenarios of the COVID-19 Pandemic. Centre for Applied Macroeconomic Analysis. Working Paper 62/2020. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3635103.

McKibbin, W. and Sachs, J. (1991). Global Linkages: Macroeconomic Interdependence and Cooperation in the World Economy. Brookings Institution. Washington D.C. June. https://www.brookings.edu/book/global-linkages/.

McKibbin, W. and Stoeckel, A. (2009). Modelling the global financial crisis. Brookings Institution. Washington D.C. September. https://www.brookings.edu/wp-content/uploads/2016/06/0928_modelling_mckibbin_stoeckel.pdf.

McKibbin, W. and Stoeckel, A. (2011). Modelling the global financial crisis. Brookings Institution. Washington D.C. September. https://www.brookings.edu/wp-content/uploads/2016/06/0928_modelling_mckibbin_stoeckel.pdf.

McKibbin, W. and Stoeckel, A. (2018). Modelling a Complex World: Improving Macro Models. Oxford Review of Economic Policy. Vol. 34, 1-2, 2018, pp 329-347.

McKibbin, W. and Triggs, A. (2018). Modelling the G20. Centre for Applied Macroeconomic Analysis, Australian National University. Working Paper 17/2018. https://cama.crawford.anu.edu.au/publication/cama-working-paper-series/12470/modelling-g20.

McKibbin, W. and Vines J. (2000). Modelling reality: The need for both inter-temporal and optimisation and stickiness in models for policymaking. Oxford Review of Economic Policy. Volume 16. No. 4. pp. 106 to 137. https://ora.ox.ac.uk/objects/uuid:72cdf8f6-df6a-4c8a-be49-60e72810006f.

Morse J.M. (2000). Determining sample size. Qualitative Health Research, 10, 3–5.

OECD (2009). The effectiveness and scope of fiscal stimulus. OECD Economic Outlook Interim Report, March 2009. http://www.oecd-ilibrary.org/economics/oecd-economic-outlook-interim-report-march-2009/the-effectiveness-and-scope-of-fiscal-stimulus_eco_outlook-v2008-sup2-16-en.

Pei, M. (2012). Are Chinese Banks Hiding "The Mother of All Debt Bombs"? The Diplomat. 10 September. https://thediplomat.com/2012/09/are-chinese-banks-hiding-the-mother-of-all-debt-bombs/.

Poghosyan, T. (2012). Long-Run and Short-Run Determinants of Sovereign Bond Yields in Advanced Economies. International Monetary Fund. Fiscal Affairs Department. Working Paper 12, 271. https://www.imf.org/external/pubs/ft/wp/2012/wp12271.pdf.

Rajan, R. (2010). Fault lines. Princeton University Press. p. 208.

Resende C., Lalonde R. and Snudden S. (2010). The Power of Many: Assessing the Economic Impact of the Global Fiscal Stimulus. Bank of Canada. Discussion Paper 2010-1. January, Ottawa. http://publications.gc.ca/site/eng/365276/publication.html.

Reuters (2008). Financial crisis may be worst in history-BoE's Bean. Bond News. Reuters. 24 October. https://www.reuters.com/article/britain-bank-bean/financial-crisis-may-be-worst-in-history-boes-bean-idUSLAC00300720081024.

Triggs, A. (2018). Macroeconomic Policy Coordination and the G20. The World Economy. Volume 41, Issue 5, pp. 1309-1341. https://onlinelibrary.wiley.com/doi/abs/10.1111/twec.12607

Triggs, A. (2019). Rebalancing a lop-sided global economy. The World Economy. Volume 42, Issue 11, pp. 3188-3234. https://onlinelibrary.wiley.com/doi/abs/10.1111/twec.12839

Veld, J. and Roeger, W. (2013). Rising sovereign risk premia and the profile of fiscal consolidation. Quarterly Report on the Euro Area (QREA). Directorate General Economic and Financial Affairs (DG ECFIN). European Commission. Volume 12(1). Pp. 33-38. March. http://ec.europa.eu/economy_finance/publications/qr_euro_area/2013/pdf/qrea1_section_3_en.pdf.

Wade, R. (2011). Emerging World Order? From Multipolarity to Multilateralism in the G20, the World Bank, and the IMF. Politics & Society. Volume 39. Issue 3. Pp. 347–378. http://journals.sagepub.com/doi/pdf/10.1177/0032329211415503.