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Paul J.J. Welfens

Corona World Recession and Health System Crisis: Shocks Not Understood So Far

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EUROPÄISCHES INSTITUT FÜR INTERNATIONALE WIRTSCHAFTSBEZIEHUNGEN (EIIW)/
EUROPEAN INSTITUTE FOR INTERNATIONAL ECONOMIC RELATIONS
Bergische Universität Wuppertal, Campus Freudenberg, Rainer-Gruenter-Straße 21,
D-42119 Wuppertal, Germany
Tel.: (0)202 – 439 13 71
Fax: (0)202 – 439 13 77
E-mail: welfens@eiiw.uni-wuppertal.de
www.eiiw.eu

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Summary:

The Coronavirus World Recession is a global symmetric shock that will cause serious problems in both the US and the Eurozone. For the Trump Administration, the lack of qualified staff is a serious issue in the field of international policy coordination and developing adequate anti-coronavirus pandemic strategies. For the first time, US leadership is not visible during a major international economic crisis. In Europe, the Eurozone is facing serious problems as a "Euro Crisis 2" looms: Inflexibility on the part of both Germany and Italy are contributing to new risks, including a potential "Italexit" and a deepening of the coronavirus recession. While a simple Eurobonds approach is not feasible in the Eurozone, an innovative Joint Eurobonds (JEBs) strategy – with partial collateral and a JEBs fund (JEF) outside the institutional framework of the EU – could help to avoid a new Euro Crisis and to bring a faster EU recovery than in the United States; the proposed JEF would operate on the basis of pre-defined menu options from which JEF member countries could choose, with unanimous voting and based on the respective requirements of national parliaments, to give a green light to the new framework approach. Germany, which holds the rotating EU presidency in the second half of 2020, faces enormous responsibility, but is hesitant to give up its traditional resistance against the mutualization of bonds in the EU. The EU's recovery and loan package are unlikely to work as intended – amongst other things, the impact of the European Investment Bank loan package is likely to be much smaller than the European Commission seems to be believe. The suggested JEBs-oriented Quantitative Easing strategy would be consistent with the requirements of the verdict handed down by Germany's Constitutional Court on May 5, 2020 – concerning the European Central Bank's Public Sector Purchase Programme.

Zusammenfassung:

Die Coronavirus-Weltrezession ist ein globaler symmetrischer Schock, der sowohl in den USA als auch in der Eurozone ernste Probleme verursachen wird. Für die Trump-Administration ist der Mangel an qualifiziertem Personal ein ernstes Problem im Bereich der internationalen Politikkoordination und der Entwicklung angemessener Strategien zur Bekämpfung der Coronavirus-Pandemie. Zum ersten Mal ist die Führung der USA während einer großen internationalen Wirtschaftskrise nicht sichtbar. In Europa steht die Eurozone vor ernsten Problemen, da sich eine "Euro-Krise 2" abzeichnet: Die Unflexibilität sowohl Deutschlands als auch Italiens trägt zu neuen Risiken bei, darunter ein möglicher "Italexit" und eine Verschärfung der Coronavirus-Rezession. Während ein einfacher Eurobonds-Ansatz in der Eurozone nicht durchführbar ist, könnte eine innovative Strategie für Joint Eurobonds (JEBs) - mit teilweiser Absicherung und einem JEBs-Fonds (JEF) außerhalb des institutionellen Rahmens der EU - dazu beitragen, eine neue Euro-Krise zu vermeiden und eine schnellere Erholung der EU als in den Vereinigten Staaten herbeizuführen; der vorgeschlagene JEF würde auf der Grundlage vordefinierter Menüoptionen operieren, aus denen die JEF-Mitgliedsländer einstimmig und auf der Grundlage der jeweiligen Anforderungen der nationalen Parlamente wählen könnten, um grünes Licht für den neuen Rahmenansatz zu geben. Deutschland, das die rotierende EU-Ratspräsidentschaft in der zweiten Hälfte des Jahres 2020 innehat, steht vor einer enormen Verantwortung, zögert aber, seinen traditionellen Widerstand gegen die Mutualisierung von Anleihen in der EU aufzugeben. Es ist unwahrscheinlich, dass das Sanierungs- und Kreditpaket der EU wie beabsichtigt funktionieren wird - unter anderem werden die Auswirkungen des Kreditpakets der Europäischen Investitionsbank wahrscheinlich viel geringer sein, als die Europäische Kommission zu glauben scheint. Die vorgeschlagene JEBs-orientierte Quantitative Easing-Strategie würde den Anforderungen des Urteils des deutschen Bundesverfassungsgerichts vom 5. Mai 2020 zum Ankaufprogramm der Europäischen Zentralbank für den öffentlichen Sektor (European Central Bank’s Public Sector Purchase Programme, PSPP) entsprechen.

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Prof. Dr. Paul J.J. Welfens, *Jean Monnet Professor for European Economic Integration; Chair for Macroeconomics; President of the European Institute for International Economic Relations at the University of Wuppertal, (EIIW), Rainer-Gruenter-Str. 21, D-42119 Wuppertal; +49 202 4391371), Alfred Grosser Professorship 2007/08, Sciences Po, Paris; Research Fellow, IZA, Bonn; Non-Resident Senior Fellow at AICGS/Johns Hopkins University, Washington DC.*

Prof. Welfens has testified before the US Senate, the German Parliament, the BNetzA, the European Parliament, the European Central Bank, the IMF, the Interaction Council and the UN. Managing co-editor of International Economics and Economic Policy.

welfens@eiiw.uni-wuppertal.de, www.eiiw.eu

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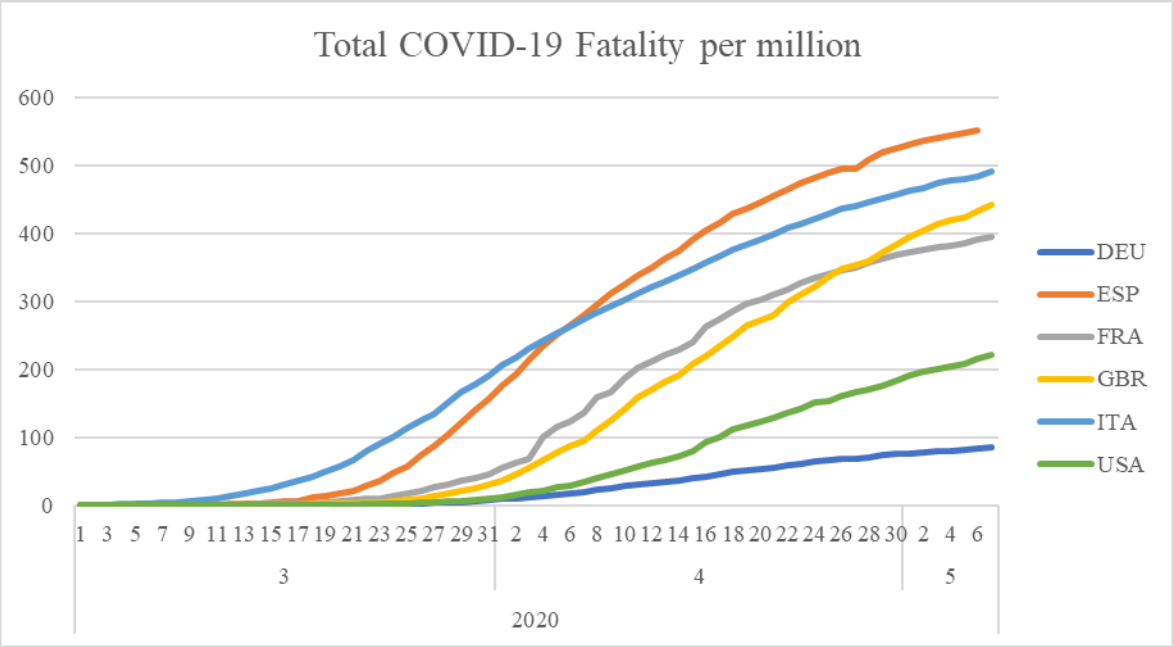
1. Introduction

The International Monetary Fund, in its World Economic Outlook preliminary report of April 2020 (IMF, 2020; for details see appendix), has suggested that there will be a global recession in 2020 – with negative output growth of -3 percent and a high output reduction in the Eurozone of -7.5 percent; Spain and Italy with an even greater expected output decline of -8 and -9 percent, respectively. The US output decline is expected to be -6 percent which is half a percentage point lower than the expected contraction in the UK in 2020. The global output reduction expected thus is bigger than the contraction experienced during the Great Recession of 2008/09, but for all OECD countries plus China a strong economic recovery is expected in 2021. The international economic development could indeed be rather favorable if a vaccination against COVID-19 should be available in late 2020, but this is a rather vague hope.

There is some evidence that the nature of the Corona World Recession is not really understood by many governments, including OPEC countries, Russia and Mexico, which were unable to organize swiftly a coordinated decline of oil production so that the world market price on April 20, 2020, collapsed and fell to zero for the first time. This suggests that other negative policy surprises are looming and subsequently the indifference of Germany's government with respect to a looming Euro Crisis 2 is one of the points emphasized; somewhat paradoxically, just months before Germany is due to take on the rotating EU on July 1. In the US, there are other specific problems including the inability of the Trump Administration to provide international leadership in the face of a global recession – a very strange scenario that indirectly reflects Trump's populist approach in a crisis situation with no major G7 initiatives.

Taking a look at COVID-19 case fatality rates, countries such as Italy and Spain – and Belgium - were particularly hard hit (see Fig. 1) and the drastic negative output growth forecasts (IMF, 2020) for Italy and Spain will certainly have reinforced the public perception in these two countries that the coronavirus pandemic has hit very strongly; in an unfair way. The EU, which emphasizes certain liberal values as well as solidarity, thus faces a particular economic policy challenge in the Corona World Recession.

Figure 1: COVID-19 Cumulated Case Fatalities (up to May 6, 2020) in Selected Countries



Source: Own representation

2. The Quest for International Leadership and Multilateralism

Both medical aspects of fighting the coronavirus pandemic and the Corona World Recession require international cooperation among many countries, including OECD countries, China, India and other G20 countries plus leading countries or countries heavily affected by the pandemic in Africa. An optimal cooperation of fiscal and monetary policy in G20, or at least between the US, China, Japan and the EU, could help to achieve faster global recovery than without such coordination. Adequate medical coordination and the joint funding of the fight against the pandemic could help to stabilize health systems as well as political and economic systems of the respective countries which all face serious problems from the high number of infected people and high case fatalities which undermine normal social, consumption as well as investment behavior. Moreover, only after overcoming the pandemic could one restore international flight networks on a broad scale which will be necessary not only as a basis for fully restarting international tourism but also important business trips, involving managers and technicians for example, are crucial for a full restart of the world economy.

2.1 Corona World Recession and International Leadership Crisis

While the economic challenge is quite serious, some international policy shifts in the context of the Corona World Recession are already obvious:

- For the first time since 1945, the United States is providing no leadership in an international economic recession; and solid cooperation between the IMF and the Trump Administration is almost non-existent. Why is this and what are the consequences?
- In the Eurozone, the EU27 has developed a €500 billion corona-related loan program that, however, will not work: That program alone will not enable Europe to avoid a second Euro Crisis in the next 24 months and represents a strange compromise position of EU countries aimed at overcoming the coronavirus recession – expected to be very serious in southern EU countries. Not only Spain and Italy, but Portugal, Greece and Croatia will also be massively influenced by the massive contraction of international tourism expenditures on top of which come reductions in industrial output in key economic sectors. The European Union is weakened by the corona medical challenges as well as the serious economic crisis in the south of the Eurozone which implies that the EU will also not provide international leadership in this global crisis.

Will China fill this leadership gap in 2020? This is quite unlikely since China's political leadership has indicated long-term ambitions for more power in Asia and possibly in some African countries. This, however, is totally different from an established concept of global leadership; there is no such concept in China's government and one also does not find this type of global perspective at leading Chinese universities. While in seminars and courses on International Diplomacy at Georgetown University – with a long tradition – one will be faced with the standard question of how issues or conflicts in key regions of the world affect US interests and policy options; such perspectives have not much been raised at China's leading universities. Naturally, some aspects have been discussed within China's Academy of Sciences and the Academy of Social Sciences, but occasional reflections and a few scholarly papers cannot replace a firmly established international and global policy perspective of government and its main think tanks.

The lack of leadership in the US traces its roots to internal and ideological causes: President Trump favors bilateralism and thus has little ambition to present himself as a leader in fighting the Corona World Recession; secondly, his Administration would be unable to deliver leadership in a traditional way since about there is a lack of about 1,000 political appointees – Trump was only able to replace about three-quarters of the political appointees of President Obama. By early 2017, too many top experts from leading think-tanks in Washington DC and elsewhere already saw too high a career risk in accepting a job offer from a populist President whose strange speech at the inauguration ceremony and remarks thereafter about the biggest crowd that ever had attended such a ceremony – much in contrast to the TV pictures shown – raised doubts about the leadership quality of Donald Trump. Given the staff gap in the Trump Administration, the IMF would not know to whom to talk in the Treasury, as is also the case in the Department of Commerce where there are gaps of competence which would make US leadership quite difficult to implement even if Trump would want to provide such leadership. The effect of this staff gap would be invisible to the outside world as long as the world economy and the US

showed high growth - but in the World Corona Recession, this weak point of the US government indirectly becomes starkly visible. A lack of US leadership means that coordination among OECD countries plus China is inadequate and hence the economic price of overcoming the global recession will be higher than it would normally be.

2.2 European Global Health Initiative in the Corona Crisis

The coronavirus health crisis gives the EU a new opportunity to develop active leadership in a critical field of international policy: If one could develop a new vaccination rather quickly, this would be a success for humanity and it would indeed create a global public good – protection against COVID-19. Normally one would expect the US president to take the leadership in fighting a pandemic, but there is no such US leadership visible; President Trump seems to be overly focused on domestic issues, his emphasis on bilateralism and the new diplomatic conflicts with China, namely the extent to which China mishandled the early stages of the epidemic in China in December 2019. In this situation the EU, in cooperation with Norway, has developed its own initiative: In a joint op-ed contribution in major newspapers, published on May 2, 2020, European leaders Angela Merkel (Germany), Emmanuel Macron (France), Giuseppe Conte (Italy), Erna Solberg (Norway), Charles Michel (President of the European Council) and Ursula von der Leyen (President of the European Commission) have argued that only a global pandemic policy response would help to fight the coronavirus successfully and bring equitable access to new medication and vaccination.

In an Online Donor Conference on May 4, the EU countries and the European Union wanted to raise at least €7.5 billion in order to fight the financing gap of the Global Preparedness Monitoring Board (GPMB). The op-ed says “we are determined to cooperate with all actors who support our commitment for international cooperation”. The European leaders emphasized that their commitment picks up the promises of the G20 to develop a coordinated reaction against the new virus; EU countries were also among the pioneering countries who launched a new platform “Access to Covid-19 Tools (ACT) Accelerator” – also emphasized in the op-ed contribution - which is supposed to help in supporting the development of new therapies and vaccinations while making sure that any medical progress will be made available worldwide. The European leaders from the op-ed explicitly mention the Wellcome Trust, from the UK, and the Bill and Melinda Gates Foundation, from the US, as cooperation partners but neither the United Kingdom nor the United States as partner countries; on May 4 the UK contributed as a donor, the US not. Such EU international leadership message will be relevant only if these two countries plus China and India also support the new global initiative and if the EU is able to avoid the problem of a Euro Crisis 2.

3. Euro Crisis 2 Perspectives and a Lack of Policy Consistency in the EU

Given the internal fault lines in the EU with its ongoing debate about the Eurobond issue, it is also obvious that the European Union cannot provide leadership. Rather the EU Commission stands for analytical confusion when a Marshall Plan is announced for overcoming the coronavirus crisis. The EU has no broad extra resources available which it could mobilize and there is also no plan on how to combine European "corona recovery" activities with US transatlantic trade enhancing initiatives; the US President is no partner in this approach – perhaps the Commission waits in hope of a new US president after the upcoming presidential election on November 3. However, the United States suffers from so much internal political division that it is doubtful that a new president could offer much. The reputation and credibility of the US has been weakened considerably under Trump.

Instead of talking about a Marshall Plan, the Commission should focus on avoiding a Euro Crisis 2 which could emerge in late 2020, once Italy's debt-GDP ratio goes beyond 150 percent - and assuming that there is no quick and strong global economic recovery in the third and fourth quarters. The rise of the debt-GDP ratio has two components: The deficit-GDP ratio (say 7.5 percent in the case of Italy) plus the current debt-GDP ratio times the negative growth rate in the recession (1.35 x 9 percent). If Italy, with a government debt of about €2,400 billion, should lose access to international capital markets in late 2020 or in 2021, this will create a formidable problem for the EU: Italy faces a roll-over need of about €350 billion in 2020 and 2021, plus at least €100 billion for the current deficit of 2020: €450 billion could be offered by the European Stability Mechanism (ESM) in 2020 and 2021 only if the equity capital would be tripled which would cost just Germany about €48 billion; with no guarantee that this would be sufficient to stabilize the overall Eurozone via ESM loans which would certainly be needed by some other Mediterranean Eurozone countries as well. The €39 billion offered to Italy under the ESM pillar within the €500 billion loan package of the EU is insufficient, even if Italy would obtain from loans from the European Investment Bank (EIB) and the EU's loan for national unemployment insurance schemes - a rather generous share of 20 percent; this would be €60 billion.

3.1 Italy's Rating Problem is an EU Problem

The Fitch rating agency downgraded Italian government debt on April 28, 2020, to BBB- (with a stable outlook) which is just one level above investor grade rating; Moody's rating is at the same critical level (Baa2 is the lowest level within investor grade) while S&P puts the Italian rating 2 levels above non-investor grade. In late April, Italy's government debt – with a maturity of seven years – had to offer about 2 percent interest rate premium above the German 10-year government yield; German government bonds are rated AAA. In a model with risk-neutral investors, this implies a 2 percent probability of default for Italian government debt. One could argue, of course, that the Quantitative Easing (QE) policy of the European Central Bank has artificially reduced the risk premium on certain government bonds. It is, however, not so complex to develop a pro-growth model for the Italian economy and it would certainly be adequate if EU loan packages involving Italy consider a

relatively broad supporting pillar for that country while requiring a consistent long-term growth policy approach on the part of the Italian government. Here, however, political instability is a problem since the frequently rather short-lived Italian governments over the past two decades have all found it rather difficult to develop consistent long-term growth policy approaches. Italian deficits should not present a serious challenge if political consensus on debt-GDP ratio policy reduction as well as new growth policy elements could be achieved. As the time horizon of the European Commission and the European Council should be rather long term in strategic issues, adequate pressure plus conditional financial support packages for Italy from Brussels could be useful. The weak rating of Italian bonds in late April 2020 indicates considerable risk of inadequate EU loan packages for the Eurozone and the EU, respectively.

The European Commission's emphasis on European Investment Bank-backed loans appears to be an impressive contribution to overcoming the recession: The EIB argues that it puts up €25 billion while private complementary loans would reach €175 billion so that an overall "EIB package" of €200 billion contributes to overcoming the EU recession; however, this claim is misleading as in reality a substitution effect takes place. Private complementary loans would have been provided to firms anyway, possibly at a somewhat higher interest rate and with a slightly smaller volume. The true multiplier for EIB funds is not more than about two, which means that the effective EU package is not €500 billion but only €350 billion. The combined market share of Moody's and Fitch in the rating agency market is 50 percent, so that one further downgrading of Italian bonds by both rating agencies would force many institutional investors to sell Italian government bonds which would raise Italy's interest rate enormously. Certain institutional investors are likely to sell Italian government bonds as early as May 2020. The arguments for the rating decision of Fitch in the case of Italy are shown in the appendix – the lack of an adequate post-corona shock growth policy approach in Italy is one of the critical elements emphasized in the view of Fitch, the rather weak economic rebound of the Italian economy after the Transatlantic Banking Crisis in 2009-2011 is another. It seems that Italy's economy is not very robust in terms of shock absorption in certain sectors. However, as much as the Italian tourism sector could be strongly affected by the Corona World Recession in 2020, there could be a strong sectoral rebound in 2021 provided a vaccination has become available by mid-2021.

3.2 EIB Perspectives in the EU Loan Package

As regards the EIB, the key point of "provisioning" in the EIB approach means that the EIB takes over losses incurred on complementary bank loans for – say – financing investment projects. This means that the individual bank *i* will give more loans to firms (and bank *j* will do the same) than otherwise. If the combined investment of firms *i'* and *j'*, associated with loans from banks *i* and *j*, has a positive macroeconomic effect so that the economic upswing is reinforced, the probability of default for both banks *i* and *j* could decline. If, however, inefficient investment projects are supported via a certain share of EIB investment, the probability of default for both firms' investment projects will increase and hence the probability of default of other investment projects from banks will also be raised. This in turn would reduce the loans given by private banks to private firms. In any case, the profit maximization condition of private banks implies that part of the private co-

loans mobilized by the EIB loan package will be a substitute for loans that would have been given to firms anyway – maybe at somewhat higher interest rates.

The financial accelerator (BERNANKE/GERTLER/GILCHRIST, 1996) mechanism could work with the EIB approach, where this accelerator emphasizes the role of imperfect capital markets and the role of agency costs – i.e. the monitoring costs of banks giving loans to investors in a setting with asymmetric information – in financial markets and loan markets, respectively. However, one should not expect any multiplier above 2 (and this already would be a large multiplier). Hence, if the EIB offers €25 billion for combined public-private loan packages, the net creation of additional loans for private investment will hardly exceed €25-30 billion, while the EU would probably argue that the multiplier is 5 – but this is wishful thinking. The basic working of the financial accelerator is that an effective reduction of taxation of banks - via EIB subsidies for banks offering complementary loans to firms - translates into higher expected profits of banks and a higher equity (hence a higher bank stock market capitalization) as well as higher loans to investors. As regards the effective EU loan package, this is not about €500 billion but only €350 billion which means the fiscal impulse from the EU is not 3 percent but only about 2 percent of the EU's national income. Misleading window-dressing should not be part of a rational EU stabilization policy approach.

3.3 Negative Oil Price Shock

While the negative oil price shock (with the oil price reaching zero in April 2020) reduces production costs in 2020/2021 in OECD and Eurozone countries, respectively, the sharp decline of goods imports of OPEC countries, Russia, Mexico and other oil and gas producers will further destabilize export growth and hence recovery dynamics in Western countries. The inability of the OPEC+ group to understand the nature of the serious Corona world recession suggests that government in many countries have problems in an adequate analysis of the international pandemic dynamics; there is not only a leadership problem in the world economy in 2020, on top there is a major knowledge gap in many political systems.

For the US, a nationalization of part of the oil industry might become unavoidable and the negative stock market price shocks in the US, Russia and other major oil and gas producers will create new financial market problems that could easily spill over dangerously into the banking sector. At the same time, the emission certificate price in the EU – see the analysis of WELFENS/CELEBI (2020) -, Japan, Korea, China, California and some other countries implies negative balance sheet effects in key sectors while industries not yet covered by Emission Trading Systems could record relative gains.

There is indeed also confusion in the European Union: On May 5, 2020, Germany's constitutional court BVG (Federal Constitutional Court, 2020) has declared that the European Court of Justice verdicts on the ECB's policy are so flawed that Germany must not respect the European Court of Justice in the relevant field. This creates a major constitutional crisis in the EU as other national constitutional courts of EU countries will follow suit to the BVG; this would be the end of the European Court of Justice and this in turn the end of the European Union. BREXIT plus the BVG verdict amounts to a near-destruction of the EU.

3.4 Joint European Bonds as a Basis for a Successful Policy Mix

That Germany and other northern EU countries run the risk of not avoiding a Euro Crisis 2 and thus of facing a more massive recession in 2020 than already described in the IMF analysis and similar analyses of the European Union is rather strange. The government in Berlin in April 2020 seems to be overly focused on the national epidemic and lockdown, plus the question of options to exit from the lockdown, to take care of the historical risk of further internal EU conflicts and EU disintegration. If the corona shock through a Euro Crisis 2 should turn into an EU mega recession, Germany's output would decline by at least another 2 percent and the necessary ESM recapitalization – if the German government remains inflexible – would also reach about 2 percent of Germany's gross domestic product. Germany's deficit-GDP ratio would, only through these two elements, rise by an additional three percentage points.

The only certain way to avoid a Euro Crisis 2 in a consistent way, while fighting the Eurozone corona recession effectively, is to introduce a partly collateralized Joint Eurobond (JEB) which would have to meet several criteria as the EU has a no-bail out clause (WELFENS, 2020):

- The JEBs would be organized within a special JEB fund (JEF) created by the Eurozone countries outside the framework of the EU institutions. Thus, the EU's no-bail out clause would be respected. One might decide to dissolve the JEF after overcoming the historical Corona World Recession; or one could decide to retain this new institution on the basis of a special treaty. With the creation of the JEF, the Eurozone countries would be seen as reacting decisively to the extraordinary Corona World Recession which has already motivated policymakers in the US and the UK to adopt rather unusual economic and monetary policy measures.
- Participating Eurozone countries would have to come up with 55 percent collateral for their share of the JEB, namely in the form of gold and currency reserves. If one assumes that the volume of JEBs is 5 percent of the Eurozone national income, this would be possible for most countries, and certainly for Italy and Spain as two critical economies. Some countries might come up with some alternative form of collateral – but only Luxemburg, Ireland and the Slovak Republic had national gold and currency reserves (disregarding the equity capital share in the ECB) which was below 3 percent of national GDP in 2019.
- As regards the use of the JEB proceeds, one should earmark one half for the financing of Trans-European Infrastructure Projects (TEIPs) which can include national investment projects relevant for the TEIP: High-speed train links, the modernizing of electricity grids and renewable energy projects as well new waterways and telecommunication networks would be key elements. Countries which, over the past five years i.e. 2015-2019, had recorded rather low real income growth rates should spend one third on innovation and growth projects; support for the creation of new multinationals and higher R&D expenditures could also come under this heading where the benchmark for successful projects is a rising share in world markets and more patents in medium and high technology.
- Maturities of JEBs should be two, ten and thirty years where the shorter maturities are an interesting offer for central banks willing hold euro-denominated assets as foreign reserves while the longer maturities are attractive for banks and insurance companies. With these three maturities, a broader impulse for developing an

international Euro-based financial market would be created and the information obtained from the term structure of JEBs would reveal crucial insights (e.g., would the slope of the yield curve be flatter than for national bonds in the Eurozone). The JEB interest rate would be close to that of German Bunds so that Italy and Spain could benefit from relatively low interest rates. A ten-year loan at zero nominal interest rates might be possible and within five years, Italy would save significantly in terms of its interest payments. Through the placement of JEBs in the international capital market, the share of the euro as an international reserve currency should rise. This would bring new euro-related welfare benefits to Eurozone countries.

- The ECB should buy up to 40 percent of the JEBs and could thus firmly anchor the interest rate at a very low level for several years. By 2022, a normalization process of the policy mix in the Eurozone, the UK and the US should be expected. A negative real interest rate has to be avoided as a multi-annual phenomenon since inefficient private investment and major income inequality problems would be the result of such a continued abnormal situation.
- Italy and Spain (potentially also plus Greece and Croatia) – all likely to face serious debt financing problems in 2020-2021 – could get a share of the JEB volume which exceeds the respective share of those countries in the Eurozone's national income. This should be possible if both countries introduce a levy on the net wealth of the private sector – with some amount of basic wealth per capita left untaxed. The ratio of net wealth to gross disposable income in Spain was about 10 in 2019, in Italy about 8 (ECB, 2020; for France, the ratio was 9, for Germany 7). With this institutional guarantee for paying interest and principal, JEBs would be a valuable instrument to broaden the basis of expansionary fiscal policy in Italy and Spain, strongly if necessary; a certain share of the revenue from the wealth levy should go directly to the JEB fund. The situation in Greece will be very difficult in 2020-2022 as Greece is likely to lose access to capital markets once again.

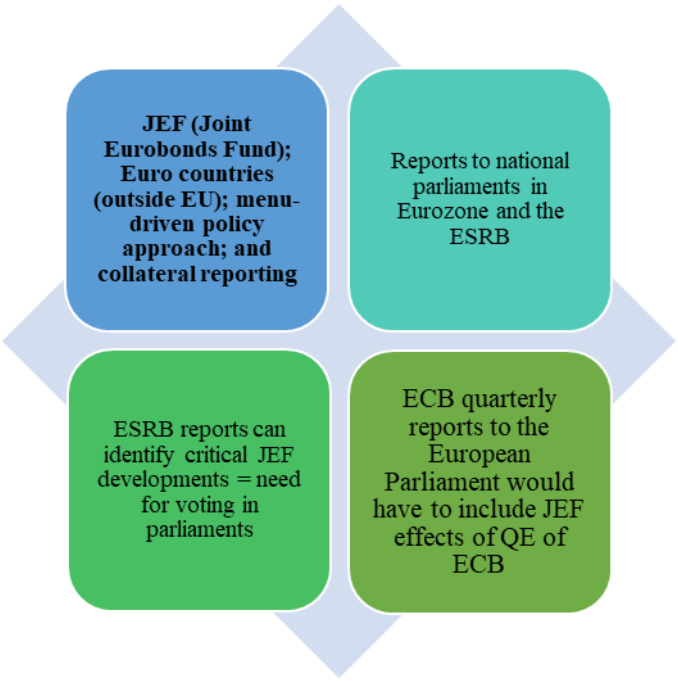
JEBs would open the way to a fiscal union within the Eurozone. Countries in the Eurozone could decide to shift part of military expenditures and infrastructure expenditures to the Eurozone level provided that a Eurozone Parliament would be elected along with the European Parliament in 2024. According to IMF simulations (ARNOLD ET AL., 2018), a joint fiscal policy would generate a faster economic recovery from the trough in the economic cycle and indeed reduce the fall of consumption expenditures in a Eurozone recession. Italy has suffered from slow growth for many years, but the so-called European semester procedure, which gives the European Commission an opportunity to monitor the EU countries' economic policy and make suggestions for improvement, has focused too much in past years on short-term reforms and not addressed the more long-term growth challenge. This indeed cannot thus far be expected from the Commission – such a report may be expected only once the definition of the Commission's role in the European Semester has been broadened to address, perhaps every second year, the long-term growth perspectives and policy options for innovation and growth in a special report.

JEBs would not only help to avoid a Euro Crisis 2 but also be a strong signal that the European Union wants the EU integration process to continue and wishes to contribute to global leadership in periods of economic crisis. Germany, France and other EU countries also stand for positive examples of the European Social Market Economy model – with Germany and France spending 2/3rds on health expenditures (relative to national income) of the US which spends 18 percent, while both EU countries can show higher life

expectancy and lower infant mortality figures than the US. The US infant mortality figures are particularly weak: Had the US the same low infant mortality figures as Germany and France, within 60 years the US population would rise by an extra 50 million people. For good reasons, the US public is quite concerned about a possible coronavirus death toll of more than 50,000 Americans in 2020, but one may also point out that improving the US infant mortality rate in quantitative terms is more than thousand times as important while the Trump Administration has actually never addressed the problem. As regards the EU, the economic policy challenges in the Corona crisis are crucial.

If in the absence of JEBs, Italy would become a Greece-like capital market problem as was faced by EU member countries in the Euro Crisis: For years, many EU countries would face regular emergency committee meetings in parliament, including in the Deutsche Bundestag (Germany's parliament). This is a situation which could quickly destabilize the EU further and bring about both Italexit and Germexit as populist politicians in both Italy and Germany would find the debate about the financing of Italy's debt outside private capital markets to be an ideal subject and opportunity for the emotionalizing and radicalizing of political debates. It would be much better to have a new special Joint Eurobonds Fund (JEF) which would be an institution outside the EU but nevertheless supported by all Eurozone members and a joint parliamentary monitoring committee which would thus require about special decisions to be made in national parliaments only if the Eurozone countries behind the JEF would deviate from the modular rescue and stabilization menu and the associated algorithm. Thus, national parliaments could give green light for a certain range of policy measures, for example that for any extra point of JEB proceeds partition for a Eurozone member country, Germany, France, the Netherlands, Austria, Ireland, Finland would be underrepresented with a split of 4:3:1.5:1:0.3:0.2 and, for every extra GDP point of proceeds for a Eurozone member country, the additional collateral would have to be $7/10^{ths}$ until 3 percentage points and above this $9/10^{ths}$ (the maximum top ups on national shares in Eurozone GDP would be 5.5 percentage points); thus there is a semi-automatic adjustment menu for which national parliaments in the Eurozone would have to give green light just once, namely at the beginning of a well-defined four year program period. Every four years and conditional on critical events – as described in the ESRB annual reporting in the section on the Eurozone – national parliaments would extend the mandate of the JEF or wind it down. The JEF would have to submit monthly reports on the value of collateral behind the respective national loan shares; gold and currency reserves would be placed in the JEF by Eurozone member countries.

Figure 2: Institutional Setting of Joint Eurobonds Fund in the European Context



Source: Own representation

The new JEF institution would, of course, have to send annual reports to the national parliaments of its member countries and to the European Systemic Risk Board which would include JEF activities on its analytical radar. To the extent that the ECB is active in buying Joint European Bonds as suggested – to some extent – the ECB would include JEF-related activities linked to the European Central Banks' public securities purchase programs and related quantitative easing policy measures in its quarterly reporting to the European Parliament. The ECFIN forecasts of the European Commission would have to include policy steps of EU member countries active in the JEF and the JEF reports would have to include both the relevant ECB and ECFIN reports.

Interdependency Aspects EU-US-China

In May 2020, the BANK OF ENGLAND (2020) published a forecast for UK output growth in 2020: - 14 percent is to be expected according to the scenario developed by the Bank while the unemployment rate could increase to about 8 percent; the UK's inflation rate could come down to 0 percent in 2020 which partly reflects the strong decline of oil prices in the wake of the coronavirus shock in the first two quarters of 2020. The good news is that the Bank of England anticipates that output in 2021 will be plus 15 percent - which, however, does not include the effects of the British BREXIT in the context of no favorable EU-UK trade treaty being concluded for the time after 2020. The government of Prime Minister Boris Johnson had announced in early 2020 that the UK would definitely leave the EU single market at the end of that year. There is a considerable risk that a rather weak EU-UK trade integration and investment treaty would dampen economic recovery of the UK in 2021 and 2022. This in turn would also weaken the EU27 recovery. One particular delicate point in time is Germany's national elections in 2021. The United States faces an unemployment rate of about 16 percent in 2020; the debt-GDP ratio will rise from 100 percent in 2019 to about 125 percent in 2020 which raises doubts about the stability of

the US AAA rating and output will reduce by about 1 percent. Italy faces even bigger problems since its debt-GDP ratio in 2019 was already 135 percent, a figure of no less than 155 percent is to be expected at the end of 2020. The EU27 countries' GDP decline is expected, according to the Spring 2020 European Economic Forecast of the EUROPEAN COMMISSION (2020), to be about 7 percent, the highest output decline could be Italy with -10 percent. As a rule of thumb, a US output decline by 6 percent brings a 1 percent output decline in the EU as well as an output decline of nearly 0.5 percent in China and Japan. Moreover, an output decline in the EU28 (EU27+UK) of 7 percent brings an output decline in the US of 1 percent and of about 0.4 percent in China and Japan. If there is a new Euro Crisis in 2020, the Eurozone's aggregate output would not decline by 7 percent but rather by 9-10 percent in 2020 (a similar order of magnitude would hold for the overall EU) and a much slower EU recovery would be faced in 2021/2022 than in the case of no Euro Crisis 2.

Assuming that a Euro Crisis 2, with the epicenter in Italy, would occur in 2020, the additional output loss in the EU would be about €320 billion in 2020 (-2 percent on top); over four years there would be a dampening of the EU's recovery which could add €640 billion in output lost relative to the benchmark output development in 2021-2023 in the case of no second Euro Crisis. The output loss in the rest of the world economy over four years would be 0.5 percent which would be about €400 billion so that the global output loss of the Euro Crisis 2 would be close to €1,400 billion. It is clear that under normal circumstances the G7 would exert significant pressure on Eurozone and EU countries to avoid a new Euro Crisis, not least since the EU-induced output loss of the US would be about $200 billion over 4 years (temporary job losses could reach almost 1 million in the US). However, neither the G7 nor the OECD group of countries was able to achieve broader transatlantic and global economic policy cooperation in early 2020; not to mention the G20. Within the overall suggestions made here for avoiding a Euro Crisis 2, there is the assumption that Germany's inflexible policy stance in the field of mutualization would change slightly and that Italy and Spain make bold efforts to come up with additional collateral in order to obtain a share of the Joint Euro Bonds proceeds that is larger than that which would correspond to the respective country's share in Eurozone output. Once Germany's EU presidency has started on July 1, 2020, it could be too late to achieve broad policy innovations that are urgently necessary in the Eurozone and the EU. It also is clear that a Euro Crisis 2 would reinforce deflationary pressure in the Eurozone and thus would make it more difficult for the ECB to achieve the 2 percent inflation target in the medium term. The ECB would thus face – unnecessary – additional pressure to buy more bonds. As regards the US, the high volatility of financial markets and increasing income inequality is likely to further undermine confidence in the US banking system which in turn could undermine the political and economic stability in the country.

Transatlantic and global effects on foreign direct investment should be considered; FDI dynamics were already identified to be crucial in the case of BREXIT (WELFENS/BAIER, 2018) and to the extent that the coronavirus crisis stimulates nationalism and thus weakens regional integration clubs in the world economy, FDI aspects should particularly be considered; beyond the international trade links. It also is noteworthy that reduced profits in multinational companies – in the context of the Corona World Recession - will bring a reduction of investment in subsidiaries abroad (CRAVINO/LEVCHENKO, 2016). Thus, there is a negative international direct

investment multiplier which will affect both the OECD countries and the newly industrialized countries and this effect could dampen the growth rate of total factor productivity growth (or technological progress) as well.

For the EU, the additional output decline of a Euro Crisis 2 could be about €1,000 billion, for Germany alone about €200 billion in additional output decline – with a loss of income tax revenues and loss in social security contributions – of about €80 billion. In the rest of the world (outside the EU), output would decline by about €150 billion in the US, about €30 billion in the UK and another €70 billion outside these two countries (in sum: €250 billion). A Euro Crisis 2 thus would lead to a global output loss of about €1,250 billion. The output losses would be the combined results of mainly trade related shocks and reduced global foreign direct investment plus higher global risk premiums in the case of a Euro Crisis 2 in the world economy. If output outside the Eurozone reduces within 4 years by 0.3 percent this output decline would be €240 billion which in turn would reduce EU output by about 1/7th of €240 billion, namely another €34 billion. as a medium-term repercussion effect. The increase in political instability in the EU in the course of a Euro Crisis 2 would be considerable and this in turn would bring an additional dampening of output growth in the EU. There is clear evidence that more political instability in OECD countries brings a reduced output growth rate in the medium and long term (HOLZNER/JESTL/PICHLER, 2019). While political instability matters for the economy, it is noteworthy that such instability in Germany and the EU can actually come from a judgment of a national constitutional court.

One should not overemphasize the need for higher private and public investment in OECD countries compared to the early 2000s. It is often overlooked in the policy debate how enormously the prices of ICT capital goods have fallen and how high the share of ICT capital investment in overall investment has become. The relative and absolute price index for information and communications technologies has declined over decades; the investment gap calculated, for example by the DIW research institute for Germany, on the basis of nominal investment-GDP ratios are misleading: If one instead uses the ratio of real investment to real GDP, the relevant ratio increases by 3 percentage points (WELFENS/IRAWAN/PERRET, 2016). The role of ICT capital for structural change has also been emphasized in the literature (ADAROV/STEHRER, 2020). More promotion of innovations in the non-tradable sector and the tradable sector – including green research and development projects – would make sense. In the tradable sector promotion of innovation should have as a benchmark world market shares of the respective sectors.

3.5 The Federal Constitutional Court Judgement and the Logic of the Proposed JEB Program

In a judgment delivered on May 5, 2020, Germany's Federal Constitutional Court found that part of the European Central Bank's public sector purchase programme (PSPP) is unconstitutional and is in violation of the EU's and ECB's key principle of proportionality (Federal Constitutional Court, 2020). By contrast, in its general acceptance of the PSPP, the European Court of Justice had not considered the principle of proportionality to have been a critical issue. Thus, the Federal Constitutional Court has indirectly criticized the position of the European Court of Justice and the consequences of the judgment for the

Deutsche Bundesbank and the German government mean that in future due attention at the ECB has to be given to the principle of proportionality: The ECB cannot argue that PSPP is used to achieve the ECB's monetary policy goal of an inflation rate of under but close to 2 percent while not considering and explaining the effects of PSPP in a broader economic policy perspective. The Court in Karlsruhe has explained that "A programme for the purchase of government bonds, such as the PSPP, that has significant economic policy effects requires that the programme's monetary policy objective and economic policy effects be identified, weighed and balanced against one another" (Federal Constitutional Court, 2020).

As regards a potential QE program of the ECB (some form of PSPP) with a focus on JEBs as suggested here, the ECB would have to consider the following key aspects:

- The program helps to avoid a massive recession in the Eurozone – possibly in the extreme form of a Euro Crisis 2; a massive recession would bring instability to financial markets and a deflationary effect so that the monetary goal of achieving an inflation rate of under but close to 2 percent would be missed in the Eurozone.
- With a strong 55 percent collateral for the respective national bond share in the suggested Joint Eurobond, the effective liability risk for Germany and any other individual country in the Eurozone is rather limited, particularly since the rules for using the proceeds of the placement of JEBs in capital markets make sure that it is primarily trans-European infrastructure projects which are financed which would stimulate output and the long run growth of real income so that the probability of a critically rising debt-GDP ratios is minimized. This holds all the more since one-third of the proceeds from JEB placement has to be used for innovation enhancement and growth-promotion economic policy. In the EU's single market, this particular supply-side element reinforces the overall economic strength of the Eurozone in a medium and long run perspective and also helps to generate future additional tax revenue which allows to avoid a repetition of big deficit-GDP ratios in Eurozone member countries – and hence any future risk of violation of the "no bailout" clause in a broader context. According to the Domar rule, the long run debt-GDP ratio is determined by the ratio of the structural deficit-GDP ratio to the trend growth rate. The supply-side elements of the uses side of the proceeds of JEBs reinforces economic growth in Eurozone countries and in particular there is an opportunity – within the JEBs architecture proposed here – to do so with a special focus on countries that so far have faced rather sluggish economic growth (see next point in particular).
- The fact that Italy and Spain, as countries which are particularly exposed to a corona-shock, have the option to negotiate with Eurozone partners to obtain a share of the JEBs' proceeds which exceeds the share of the respective country's GDP only if that country comes up with additional collateral – for example, a wealth levy earmarked to go toward paying the principal and interest of the relevant respective country's share of JEBs – is an adequate reflection of the principle of proportionality (as emphasized by Germany's Federal Constitutional Council in its judgment on the ECB's PSPP on May 5, 2020). While the share of Germany and France, for example, in the JEB's proceeds could reduce in favor of that of Italy and Spain, Germany and France (as well as other EU countries) would enjoy particular benefits from the economic stabilization of Italy and Spain since the trade links of both Germany and Franc with Italy and Spain are rather strong. By avoiding a new Euro Crisis 2, Germany's real income would be stabilized (e.g. an

additional 2 percent output decline in a Euro Crisis 2 causes an additional output loss of about €68 billion and also implies a loss of tax revenue and social security revenues of €27 billion). As the Eurozone could have a faster recovery and also a spatially more equal economic recovery due the JEBs-oriented QE of the ECB, there is a strong overall economic logic for including this pillar in an adequate policy mix that would encompass monetary policy, fiscal policy and growth policy – the latter two elements as part of national member countries' and the EU's economic policy. As banks and other institutional investors would have new high-quality assets – JEBs – there is also an opportunity to stabilize the Eurozone's banking system which in turn could help to undermine potential ECB conflicts in key policy fields, namely monetary policy and prudential supervision; it could remain a task of the European Systemic Risk Board to analyze the overall policy mix and the international and global economic situation in the Corona World Recession.

Thus, the JEBs-oriented policy approach suggested here makes economic sense and is also fully in line with the basic reasoning of Germany's Federal Constitutional Court. Additional simulation studies by the ECB and the European Union could reinforce the arguments presented here.

Need for Change in Modelling

There is a serious practical impediment to the ECB's broader view on economic policy goals since those concern mainly employment and economic growth aspects: The typically distinct modelling approach of the DG ECFIN in the European Commission – here, the focus within the QUEST model is on these variables as well as deficit-GDP and debt-GDP outcomes (but not on monetary policy) – and the European Central Bank's DSGE Macro model, looking into effects of monetary policy but not into effects of fiscal policy, is a somewhat artificial twin-pronged analytical approach which is not fully adequate. The ECB cannot fully understand the impact of its policy measures on economic policy goals if there is no joint modelling round between the European Commission and the European Central Bank. Here, changes should be considered in the future in order to better understand the effects of the policy mix and in particular of quantitative easing measures of the European Central Bank.

3.6 EU Reconstruction Funding Approach

In late April, 2020, the EU countries signaled the willingness to contribute more – over a few years – to the EU's budget and thereby a new option becomes available to help the EU countries which have been hit especially hard by the Corona Shock with respect to case fatalities and the depth of the recession 2020; here Italy and Spain are particularly exposed. EU budget contributions could be raised and budget payments could be used as a guarantee to finance a large deficit spending program via the European Union. Italy and Spain have emphasized the need to get high transfers while many countries in northern EU countries argue that transfers could be only a modest part of the package; the main emphasis would be on loans and more expansionary fiscal policies in the EU. Italy's government has

proposed that loans should have indefinite maturities, a suggestion which, however, has been rejected by governments in Germany, the Netherlands and several other countries.

The EU could organize some €350 billion of loans for EU member countries and this amount would be topped-up by €1,650 billion of additional loans from the private sector. With such a contribution of the private sector, the European Commission and the European Council would argue that €2,000 billion is the contribution of the EU for overcoming the Corona Shocks. However, the effective EU contribution would be only €350 billion - which amounts to about 2 percent of the national income of the European Union. Most of the €1,650 billion from the private sector stands for a substitution effect – banks will provide roughly the amount less in terms of normal loans to firms. Thus, there is a big window-dressing effect on the side of the EU approach.

What is Italy's main problem in the Eurozone? As regards the debt-GDP ratio (almost 135 percent in 2019), Italy's main problem is insufficient economic growth – compared to Eurozone partner countries. This is obvious from a comparison of growth in the Eurozone-without Italy compared to Italy's growth rate, which has underperformed for about 15 years compared to the Eurozone partner countries. Italy's main challenges in the field of economic growth used to be problems in the field of education, particularly higher education (with a drop-out rate of students before graduation of about 50 percent or higher (AINA ET AL., 2018), overregulation of labor markets and insufficient investment, but in the 15 years after 1995, Italian reforms went into the right direction under various governments while corruption remain a key problem (GROS, 2018). A major problem seems be that Italian governments are not implementing many of the suggestions in OECD country reports and the EU's European Semester Country Reports. Among the problems largely overlooked is insufficient spending on research and development and lack of both inward and outward foreign direct investment – relative to national income – which implies insufficient technological progress. Among the positive perspectives of the Italian economy is the positive current account surplus over many years so that Italy's foreign indebtedness is a rather limited problem at first sight. However, one should not overlook that both domestic investment funds and foreign investment funds could react very swiftly if Italian debt would be downgraded.

Losses faced by the Italian private sector and in particularly the banking sector could be rather high if the Italian interest rate would increase or if a "hair cut" on the stock of Italian debt would occur. Claims of Italian banks to government – through government bonds in banks' balance sheets and banks loans to the government – added up to more than €700 billion of which about €400 billion are government bonds: A 30 percent hair cut (likely under adverse economic developments only) would generate €120 billion of bank losses at first, but prospects for lower market interest rates after the hair cut on government bonds could raise the market value at the same time. SAPIR (2019) has compared the Italian debt developments with those of Belgium where the author has argued that the reduction of Belgium's debt, from 138 percent in 1993 to 87 percent in 2007, was possible because the consolidation policy in Belgium was supported by broad political consensus. In Italy, no such consensus was visible then and no such consensus is visible now. Italy achieved some consolidation progress in terms of its debt-GDP ratio, but much more modest than Belgium and other countries. With a populist right-wing party waiting to come to power and a left-wing populist party in power, the probability of broad political consensus in Italy in the field of debt policy is close to zero.

It is, however, unclear whether member countries will come up with sufficient new and appropriate projects to be financed from much higher fiscal expenditures. There is a considerable risk that a large share of the funds will be used for rather inefficient investment projects plus public consumption and initiatives to raise public sector wages which would be a drag on the tradable sector and thereby would reduce net exports of goods and services (relative to gross domestic product). One should also point out that insufficient monitoring of the spending of the additional funds could be a major problem in the EU, which typically often has serious problems concerning the monitoring of national spending of EU regional and structural funds. About half of EU regional funds has been found to have no significant effects in the respective EU regions. There is also the big question of whether or not the EU really wants to engage in substantially higher expenditures without adequate reforms towards a fiscal union; if the Corona Shock and the new massive spending programs would not lead to steps towards a fiscal union, such an institutional modernization and deepening of EU integration will never be created.

Without a fiscal union, the Eurozone is likely to disintegrate in future recessions. While it is obvious that the Corona Shock and the epidemic challenges have reinforced economic and political nationalism in EU countries in the short run, it is also clear that the European Union faces a historical challenge: Weakened through BREXIT and facing pressure for further exits in the medium term – with Italy being an obvious candidate under unfavorable political circumstances – the EU countries should consider what the minimum level of institutional modernization is which should be realized in the early 2020s. After 2025, there will be a rising demographic rift in the EU as ageing in Germany, Italy and Spain will accelerate while the situation in France is more favorable (and also more favorable in the UK). The different ageing dynamics will contribute to different national interests which, in turn, will make cooperation in the EU and institutional changes much more difficult. If the historical opportunity to create a supranational fiscal union – with stricter rules on national government spending limits – is ignored, the EU is likely to gradually disintegrate in the coming decades. It could disintegrate into a Mediterranean/Southern bloc headed by France and a new *"Mitteleuropa"* in the Northern and Eastern part of the current EU headed by Germany. Such a situation is bound to lead to new conflicts within Europe and sooner or later would push Germany to seek nuclear military options; political disintegration would bring economic disintegration in Europe as well and both would stand for a further historical weakening of the Western world. All of the basic goals of EU integration in its starting year 1957 would have been given up for good.

If the US cannot provide leadership in international economic crises, the EU should try to do so: Germany/France plus other EU countries could do this. The Trump Administration cannot provide leadership since a) President Trump dislikes multilateralism, b) the Trump Administration suffers from a lack of about 1,000 staffers and experts (only three-quarters of the political appointee vacancies after Obama were filled under Trump) and c) US society is so politically polarized that leadership not feasible and credible.

4. Policy Conclusion

The coronavirus pandemic will leave many challenges for health care reforms in EU countries as well as in the US. In Italy, it has become clear that part of the high case fatality rates in Lombardy (a northern part of Italy) is largely attributable to the irresponsible decision of the regional government under the right-wing Lega political party to bring coronavirus-infected patients in many cases to care homes which was a totally inadequate decision in February and early March 2020 – this contributed to a deadly infection spiral among the elderly: Populism kills.

As regards health care systems, much more attention should be given to the economic and medical role of these systems. The US faces a formidable challenge to modernize its health system – excellent in some fields, but weak in many fields. A standard surgery at a US hospital costs three times as much as the same procedure in Germany, which suggests that there is a lack of adequate organization of the hospital sector in the US. One should not rule out that both EU countries and the US could find useful ideas for reforms in Singapore where life expectancy is as high as in Germany and France while the country spends about one third less on health expenditures than the two EU countries and just about one half of the US price tag for health.

A particular weakness of the US system is the fact that 13 percent of the population are without health insurance and many people clearly have underinsurance by Western European standards. In the end, the high share of 18 percent of US health care expenditures relative to gross domestic product is not only an excessive drag on resources but it actually contributes to US competitiveness problems. Workers are well aware of health care costs and will try to get some compensation in the wages paid by firms for which they are expected to work; in economic terms, and taking into account that the share of wage income in total GDP is about 2/3rds, the comparison with Germany and France means that the high US health expenditure-GDP ratio amounts to a 4 percent export tax of the US. While President Trump has emphasized how crucial the alleged US trade balance deficit ratio is, he has never addressed the issue of the exceptionally high health expenditure-GDP ratio that in many fields reflects the enormous lobbying power of major health care service providers and of pharmaceutical firms. US economic policy under President Trump has been inconsistent in many fields and health care policy as well as trade policy and fiscal policy were just three of the more key problem areas (WELFENS, 2019). The US under President Trump is heading towards an enormous increase in the debt-GDP ratio; already before the coronavirus crisis, the independent Congressional Budget Office (CBO, 2020) made a forecast that a continued Trumpian deficit policy would lead to a debt-GDP ratio of 180 percent in 2050.

Difficult Debt Policy Perspectives and Need for Institutional Innovations

The Corona World Recession clearly brings higher government deficits in the context of very expansionary fiscal policies. If one assumes that the deficit-GDP ratio can be reduced by 3 percentage points per year after 2021, China's debt-GDP ratio would increase by more than 30 percentage points (weakening China's position in international capital markets), that of France by more than 18 points, that of Greece by more than 22 points and that of Italy by more than 18 points through deficits and an additional 12 points through an

expected output decline of Italy by 9 percent (estimated output decline from IMF World Economic Outlook, April, 2020: 9 percent times 1.35 = 12.15 percent). The debt-GDP ratio of Portugal will increase by more than 9 points, that of Spain and the UK by more than 19 points and that of the US by more than 29 points within in the period 2020-2024. As regards the US, the assumption of a real GDP decline by 6 percent in 2020 and zero output growth in 2021 brings an increase of the debt-GDP ratio by about 35 points until 2022; just for 2021 the increase in the US debt-GDP ratio could be close to 25 percent (a deficit-GDP ratio of 19 percent plus the impact of the negative output growth rate) it is unclear whether or not the US will be able to maintain a broad AAA rating; with S&P it already stood at AA in 2019. By 2025 the US debt-GDP ratio could be close to 160 percent if one assumes that the US government could reduce the deficit-GDP ratio every year by 3 percentage points. If the US government bonds would face a downgrading this would raise the US cost of capital and also could stimulate global growth for more Euro-denominated reserves in central banks provided that the Eurozone avoids a Euro crisis 2.

The effective debt-GDP ratio could be lower through the Quantitative Easing policies in the US, UK and the Eurozone than indicated in the above figures. Roughly speaking, the central banks' QE policies imply that about 40 percent of national debt (in the Eurozone, of Eurozone countries' debt) could be held by the respective central bank: This alleviates the rollover risk of the various countries in an artificial way which is inadequate as a long-term strategy – government is paying interest on government bonds held by the respective national central bank or the ECB, while central banks' thus induced higher profits are largely recycled as a revenue to government budgets. From this perspective, the potentially critical ratio of debt-GDP (when the likelihood to lose access to capital markets is critically high) would be raised from a hypothetical critical 160 percent of GDP to an effective ratio of 224 percent of GDP in the case of Italy. Here lies a danger of QE policies of the ECB, since a Eurozone member country could push its debt-GDP ratio towards the critical value in order to capture the ECB which would be forced to continue its QE policy forever – otherwise the ECB, reducing QE over time (read: selling government bonds) would cause the default of a Eurozone member country. This is not the reason the ECB was created. However, there is clearly a moral hazard problem on the side of Eurozone countries. Paradoxically, a very generous ECB QE policy could indeed indirectly promote this moral hazard behavior. Thus, the ECB should announce in advance with every announcement of QE policy as of what time period – or under which conditions - the phasing out and reversal of QE is to be expected.

Eurozone member countries should put every necessary pressure on partner countries in the Euro monetary union not to come close to their respective critical debt-GDP ratios. It is likely that the only way to achieve this is to create a special scientific Independent Debt Stability Board that would regularly give advice to Eurozone countries' governments and the JEBs fund, respectively. A JEBs fund should not be created without a clause in the statutes that the JEBs fund should not compromise the ECB's political independence; and that in case of conflicts with the ECB and the European Commission, the European Court of Justice is the relevant institution in all legal matters in this field.

As the long run debt-GDP ratio of a country is determined – following the DOMAR rule – by the ratio of the structural deficit-GDP ratio to the trend growth rate, it is obvious that Italy's government and the EU (potentially also the OECD as a whole) should come up with a pro-growth reform agenda of economic policy. The Italian government, as well as

governments of the other Eurozone countries, could follow the Brisbane approach of the G20 meeting of 2014 which emphasized measures to increase long run output growth by at least 2 percentage points in a sensible framework: The OECD was monitoring the growth policy elements and offering some modelling of alternative policy options of national governments - if needed also complementary research. Education, the ICT sector, R&D expansion and the creation of new multinationals – including digital micro multinational companies – should be part of the Eurozone growth agenda; possibly also including green growth elements. As regards climate policy progress, the EU's European Semester Country Report for Italy (EUROPEAN COMMISSION, 2020b) has pointed out that the Italian governments have achieved considerable progress in this field and have shown a strong performance.

Italy's very frequent government changes point to constitutional problems; hence if the EU should give extra transfers and loans to Italy, the country should be expected to modernize its constitution so that more political stability can be expected. Italian governments would then have better options regarding the adoption of adequate growth policies. As regards Italy's current account surplus this is a welcome stabilization element for a convincing fiscal policy and supply-side mix of Italy. Anti-EU protectionism of the US would undermine Italy's stability and the Italian current account, respectively. There is no doubt that Italy's strong exposure to the Corona shock deserves broad EU support for an adequate recovery and reform package.

The EU approach to create a huge recovery package with a volume of more than €1,000 billion raises problems concerning the efficiency of EU funding and could also be doubtful if a vaccination becomes available relatively quickly (say in late 2020, as some plans from Switzerland suggest). Without adequate economic growth policy approaches in EU member countries, such a new mega fund will hardly contribute to a sustained recovery and economic convergence in the EU.

One should also analyze the extent to which negative real interest rates in the Eurozone could undermine efficiency, innovation and optimum economic growth. Negative real interest rates are likely to characterize the Eurozone for several years to come and could lead to excessive capital accumulation and a violation of the golden rule of the Solow growth model.

Other critical developments with respect to economic recovery could also be analyzed and one might consider a special oil and gas tax to stabilize the market price and hence also the CO2 pricing in Emission Certificate Trading (ETS) in the EU; this transitory oil price stabilization tax could be earmarked for generating the financial basis to finance €50-100 billion in transfers to the countries with the highest number of coronavirus case fatality rates which apparently would include Italy and Spain. Indirectly, following CELEBI/WELFENS (2020), this would help to stabilize the CO2 emission certificate price in the EU so that a new source of losses for companies in sectors with CO2 ETS activities would be avoided.

The oil price has massively fallen in March and April 2020. Assuming that the oil and gas prices will remain rather low in 2020-2022, in most Eurozone countries this could contribute to a fast economic recovery and improve the Eurozone's current account so that a real appreciation of the Euro is to be expected in the medium term. In the medium term, this would, however, dampen the economic recovery in the EU while for the US low oil

price have an ambiguous impact on output growth – the oil and gas sector will shrink and several banks with strong exposure to the oil and gas sector will face considerable problems while consumers and many companies will enjoy lower oil and gas prices. A recession in OPEC countries, Mexico and Russia will undermine US and EU export growth in the medium term.

New Approach: Supply-constrained Fiscal Policy

The government-imposed effective lockdowns of several sectors imply that epidemic-related cuts of the aggregate production potential Y^{pot} occur during the coronavirus recession. As regards sectors, one may at least make a distinction between the tradable sector (T) and non-tradable sector (N). Output of the T-sector is influenced negatively on the demand side by both domestic demand in the T-sector and international tradable demand which in turn is affected by lockdowns abroad. Expansionary fiscal policy without a sectoral and a quasi-supply-oriented component runs the risk of creating major sectoral distortions. For example, if the T-sector's production potential is constrained through lockdowns and the non-availability of imported intermediate products by 50 percent and has a capacity utilization of 80 percent, while the N-sector has an effective production potential of 80 percent and has full capacity utilization, then a strongly expansionary fiscal policy would be rather doubtful as an excess demand in the N-sector will occur so that the relative price of the N-sector will increase which in the medium term could cause a relocation of labor and capital from the T-sector to the N-sector. The current account situation would thus deteriorate due to an inadequate fiscal policy and the aggregate price level would also increase as a side effect of an excessively expansionary fiscal policy.

The general principle should be that as governments reduce the degree of lockdown (v), a well-dimensioned expansionary fiscal policy could be used to stimulate demand in a way that the degree of capacity utilization is raised. The epidemic and the associated quarantine and lockdown decisions, respectively, thus create a unique challenge for fiscal policy, namely to adopt a supply-constrained fiscal policy where the supply-side orientation means that fiscal policy should take into account the current and planned opening-up (i.e. ending the lockdown) policy steps of government. It is quite obvious that in the tradable sector, fiscal policy of various countries – e.g. in the EU with strong cross-country links through intermediate product trade – should be coordinated adequately. This perspective is also relevant within the OECD country group and with respect to the OECD+China+India group. The OECD could have a special role in the economic upswing – overcoming the economic corona crisis – since the OECD outreach approach indeed includes informal cooperation of OECD countries with China and India; the G20 and the IMF could undertake complementary coordination activities.

Further Conclusions

The Corona World Recession is a wake-up call for the Eurozone to get its fiscal policy and hospital systems in order; and for the US to discuss a broader overhaul of its rather inefficient health system and the foundations to restore international leadership. With or without Trump, the US political system faces the problem that during his (first) term in office as President of the United States, the populist Trump has so reinforced the internal political division in the US that the patently obvious lack of internal political consensus makes credible international leadership almost impossible. In the end, it will be the task of the Republic Party to end the right-wing US populism and to work seriously on healing the

many rifts that have emerged under Trump. If the US and the EU would not be up to the new corona-related challenges and problems which have become visible sharply in 2020, the world economy would be in disarray for many years to come; an international economic crisis without leadership provided by a big and stable economy will become more expensive for most countries on the one hand, while on the other hand increased political instability in the US and the EU would raise the probability of major international recessions.

If the EU would fail to avoid Euro Crisis 2, one would have to expect enormous pressure for "Ital-exit" – just a year after the UK left the EU. If a founding member of the EU would leave the community, this would be the end of the European Union which could fall apart into two or three different blocs, leading Europe back to the Grand Powers regime of the late 19th century; with one visible difference being that European countries would be increasingly under the influence of the US, China and Russia as the three leading grand powers.

In the end, structural US populism will remain a problem – with or without the re-election of Donald Trump. Since the 1980s, the US has suffered from an ongoing rise of economic inequality that is much more drastic than developments in Western Europe where the share of the lower half of the population – referring to the median market income - has reduced only from 22 percent to 20 percent between 1981 and 2015. By contrast, the US has witnessed a fall of the lower half's income share from 21 percent to 13 percent in the same period; and this is not the end of this trend (WELFENS, 2019). Moreover, a decisive point with respect to the US problem setting is that a relative majority of survey respondents have declared that government should not correct what is perceived as an unfairly rising inequality: Rather big companies should do this which, however, is simply wishful thinking. Thus, US society is likely to continue to have the lower half of income earners – a bit less than 50 percent of voters (voter participation in low income strata is lower than average) – experiencing a situation of ongoing frustration which creates new opportunities for populist candidates who promise big changes at zero cost, but who in the end will not deliver much. Just consider the tax reform of the Trump Administration which has only served to reinforce income inequality in a post-tax income perspective. Given the US economic and political history, it is also clear that the United States is not likely to quickly switch to a more European-type tax system. However, the corona shock - which reveals many weak points of the US health system for the large majority of US voters for the first time (also visible in comparison with, e.g., Germany) - could be an impulse for a broader US debate on systemic reform.

The Western world has damaged itself in various ways: The UK through a populist BREXIT, the US through the policies of a populist Trump Administration and the EU through Germany's lackluster EU integration policy as well as Italy's lack of growth policy over two decades after 2000. In the midst of the corona shock, mid-March to mid-April 2020, the EU ministers of finance had two very long meetings only to find out that the common agreement found in the week before Easter was not really acceptable to the Italian coalition government. The political system of the EU and the Eurozone, respectively, is confusing and bound to generate inconsistent policy approaches. The global stress test of the Corona World Recession has started to reveal both the strengths and weaknesses of the Western world; at least now, at the beginning of the corona crisis, the weak points are more visible than the strong of Western OECD countries.

Appendix 1: Reserves and Foreign Currency Liquidity in Percent of Gross Domestic Product

Table 1: International Reserves and Foreign Currency Liquidity (% of GDP)

Country / Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Portugal	8.81	8.71	10.47	7.75	8.53	9.73	12.18	11.80	10.36	**10.57**
Lithuania	17.74	18.86	19.90	17.39	17.96	4.09	6.05	9.34	10.83	**9.48**
Italy	7.47	7.60	8.76	6.83	6.60	7.13	7.28	7.75	7.35	**8.82**
France	6.28	6.01	6.87	5.15	5.02	5.66	5.94	6.04	5.99	**6.98**
Slovak Rep.	2.42	2.46	2.68	2.19	2.61	3.27	3.22	3.78	4.91	**6.73**
Malta	6.18	5.39	7.64	5.91	5.48	5.34	5.91	6.53	7.04	**6.31**
Germany	6.37	6.37	7.05	5.31	4.95	5.17	5.34	5.46	5.02	**5.80**
Belgium	5.54	5.58	6.18	5.17	4.78	5.28	5.01	5.27	5.05	**5.60**
Spain	2.23	3.16	3.78	3.40	3.65	4.50	5.10	5.27	4.95	**5.35**
Austria	5.68	5.83	6.64	5.42	5.63	5.82	5.93	5.17	5.09	**5.27**
Netherlands	5.45	5.66	6.53	5.28	4.81	5.00	4.63	4.62	4.21	**4.81**
Estonia	13.02	0.89	1.30	1.25	1.63	1.80	1.47	1.29	2.46	**4.60**
Cyprus	4.46	4.39	4.79	3.81	3.80	4.09	3.99	4.00	3.79	**4.26**
Finland	3.85	3.77	4.31	4.17	3.90	4.30	4.38	4.15	3.76	**4.24**
Greece	2.13	2.39	2.95	2.40	2.62	3.06	3.53	3.84	3.48	**3.97**
Slovenia	2.22	1.92	2.04	1.91	2.03	1.99	1.66	1.83	1.73	**1.88**
Luxembourg	1.60	1.69	1.75	1.56	1.30	1.35	1.65	1.41	1.35	**1.52**
Ireland	0.95	0.72	0.76	0.69	0.69	0.76	1.20	1.32	1.37	**1.49**
Latvia	31.96	22.41	26.73	26.08	10.28	12.77	12.68	15.13	12.53	

Source: IMF, own calculations

Appendix 2: International Reserves and Foreign Currency Liquidity in Percent of Gross Domestic Product (without reserves at the European Central Bank)

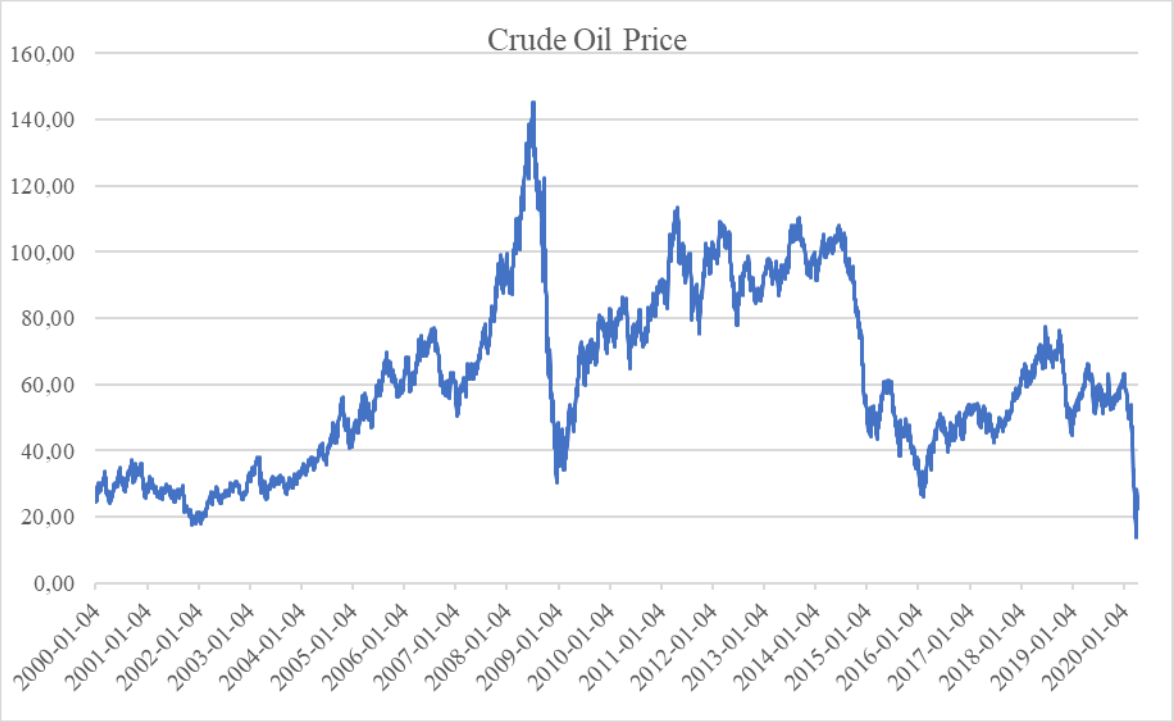
Table 2: International Reserves and Foreign Currency Liquidity (% of GDP; without reserves at the ECB)

Country / Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Portugal	8.26	8.14	9.82	7.18	7.97	9.10	11.56	11.21	9.79	**10.00**
Lithuania	16.90	18.11	19.11	16.73	17.34	3.38	5.35	8.70	10.22	**8.86**
Italy	7.03	7.18	8.28	6.40	6.18	6.65	6.80	7.28	6.88	**8.33**
France	5.88	5.62	6.44	4.78	4.66	5.25	5.52	5.63	5.59	**6.55**
Slovak Rep.	1.76	1.84	2.01	1.61	2.04	2.65	2.59	3.18	4.34	**6.11**
Malta	5.62	4.85	7.07	5.44	5.06	4.90	5.50	6.15	6.69	**5.90**
Germany	5.96	5.99	6.64	4.95	4.61	4.78	4.96	5.09	4.66	**5.40**
Belgium	5.15	5.21	5.77	4.82	4.43	4.90	4.63	4.90	4.68	**5.20**
Austria	5.30	5.47	6.25	5.08	5.31	5.45	5.56	4.82	4.75	**4.90**
Spain	1.76	2.69	3.24	2.92	3.18	3.97	4.58	4.77	4.46	**4.86**
Netherlands	5.09	5.31	6.14	4.95	4.48	4.62	4.26	4.26	3.87	**4.44**
Estonia	12.28	0.23	0.62	0.69	1.10	1.20	0.88	0.75	1.96	**4.08**
Finland	3.47	3.41	3.91	3.83	3.57	3.91	4.00	3.78	3.40	**3.85**
Cyprus	4.01	3.96	4.30	3.35	3.33	3.55	3.46	3.49	3.30	**3.75**
Greece	1.61	1.84	2.28	1.77	1.99	2.33	2.77	3.09	2.74	**3.31**
Slovenia	1.68	1.39	1.44	1.38	1.53	1.41	1.10	1.31	1.23	**1.37**
Luxembourg	1.31	1.42	1.46	1.32	1.08	1.09	1.40	1.17	1.12	**1.25**
Ireland	0.56	0.33	0.34	0.33	0.36	0.47	0.91	1.06	1.13	**1.24**
Latvia	31.06	21.63	25.92	25.39	9.62	12.02	11.94	14.44	11.89	

Source: IMF, own calculations

Appendix 3: World Oil Prices (WTI Daily Price). 2000-2020

Figure 3: Crude Oil Prices (WTI) in US Dollars per Barrel (Daily. 01.01.2000-21.04.2020)



Source: Own representation of data available from the Federal Reserve Bank of St. Louis

Appendix 4: Deficit-GDP Ratio in Eurozone Countries. China and the US

Table 3: General Government Net Lending (+)/Net Borrowing (+) of Selected Countries

Country	2014	2015	2016	2017	2018	2019	2020	2021
China	-0.909	-2.815	-3.702	-3.835	-4.655	-6.37	***-11.228***	***-9.569***
Croatia	-5.35	-3.315	-1.045	0.752	0.234	***-0.046***	***-6.53***	***-2.552***
France	-3.905	-3.625	-3.542	-2.771	-2.274	***-3.015***	***-9.172***	***-6.243***
Germany	0.58	0.943	1.184	1.242	1.867	1.449	***-5.523***	***-1.193***
Greece	-4.07	-2.771	0.555	1.047	0.868	***0.39***	***-8.974***	***-7.907***
Italy	-2.954	-2.552	-2.404	-2.445	-2.199	-1.639	***-8.339***	***-3.474***
Netherlands	-2.152	-2.025	0.021	1.264	1.491	1.659	***-6.164***	***-2.136***
Portugal	-7.12	-4.303	-1.97	-2.96	-0.446	0.19	***-7.094***	***-1.888***
Spain	-5.915	-5.177	-4.305	-3.024	-2.537	-2.642	***-9.509***	***-6.656***
United Kingdom	-5.557	-4.591	-3.348	-2.455	-2.217	-2.08	***-8.31***	***-5.473***
United States	-4.034	-3.566	-4.269	-4.471	-5.682	*-5.782*	***-15.448***	***-8.643***

Source: IMF World Economic Outlook Database. April 2020. Figures in red are IMF Staff Estimates (April 22, 2020)

Appendix 5: Debt-GDP Ratio and Forecast Figures in the IMF Spring 2020 World Economic Outlook (projections for 2020 and 2021; fiscal policy measures of April 2020 not included)

Table 4: Debt-GDP Ratio and Forecast. IMF Spring 2020 World Economic Outlook (April)

Country	2000	2010	2019	2020#	2021#
China	22.8	33.7	55.6	60.9	65.4
France	58.9	85.3	99.3	99.2	99.0
Germany	59.1	82.3	58.6	55.7	53.1
Italy	105.1	115.4	133.2	133.7	133.9
Japan	137.9	207.9	237.7	237.6	238.4
Netherlands	50.9	59.4	49.2	47.3	45.5
Spain	58.0	60.1	96.4	95.2	94.0
United Kingdom	37.0	75.2	85.6	84.8	84.6
United States	54.9*	95.4	106.2	108.0	110.0

*Source: IMF World Economic Outlook Database 2019. * = Data from Federal Reserve Bank. # estimation; Note: IMF forecasts is without taking into consideration major fiscal policy packages*

Appendix 6: Government Debt for Selected EU Countries, UK and US

Table 5: Government Debt: Selected large EU Countries, the UK, and US

Country	2018*	2019*†
Germany	2063.172	2015.008
France	2315.3	2393.725
Italy	2321.957	2357.724
Spain	1173.107	1200.013
Netherlands	405.504	395.525
United States	21456.363	22773.158**
United Kingdom	1838.59	1869.46**

** = Amount in Billion Local Currency Unit; for 2019 in Euro**: US €19.073 trillion; UK: €2.120 trillion; **Based on average exchange rates for 2019,*
data for the US: https://www.federalreserve.gov/releases/g5a/current/
data for the UK:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/877346/Average-for-the-year-to-December-2019.csv/preview
†= Estimates
Source: IMF, World Economic Outlook Database 2019; and own calculations

Appendix 7: German GDP in Relation to GDP of EU28, EU27 and EA19

Table 6: Shares of Germany's GDP in Relation to EU28, EU27 and EA19 GDPs

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
DEU/EU 28	18.77 %	18.63 %	19.00 %	19.51 %	19.56 %	19.63 %	19.96 %	19.76 %	19.86 %	19.78 %	19.67%
DEU/EU 27	21.75 %	21.52 %	22.00 %	22.53 %	22.67 %	22.79 %	23.20 %	22.99 %	23.07 %	22.94 %	22.78%
DEU/EA 19	26.00 %	25.83 %	26.49 %	27.21 %	27.45 %	27.61 %	28.17 %	27.96 %	28.05 %	28.01 %	27.91%
											22,377,001.3 *
											19,320,264.8 **
											15,769,682.6 ***

, **, * represent GDP for EU28, EU27 and the EA19 for the year 2018 in millions US Dollar respectively*
Source: Own representation

Appendix 8: Government Debt for Selected EU Countries, UK and US

Table 7: IMF World Economic Outlook, April 2020, Selected Indicators for Selected Regions/Countries

Country/Region	2019	2020 (Projection)	2021 (Projection)
	Real GDP (%Change)		
Greece	1.9	-10.0	5.1
Italy	0.3	-9.1	4.8
Spain	2.0	-8.0	4.3
Eurozone	1.2	-7.5	4.7
France	1.3	-7.2	4.5
Germany	0.6	-7.0	5.2
Europe	1.6	-6.6	4.5
US	2.3	-5.9	4.7
Asia	4.6	0.0	7.6
China	6.1	1.2	9.2
	Current Account Balance		
Germany	7.1	6.6	6.7
Italy	3.0	3.1	3.0
Eurozone*	2.7	2.6	2.7
Spain	2.0	2.2	2.4
Advanced Europe	2.3	1.6	1.8
Asia	1.8	1.0	1.2
China	1.0	0.5	1.0
France	-0.8	-0.7	-0.6
US	-2.3	-2.6	-2.8
Greece	-2.1	-6.5	-3.4
	Unemployment rate (%)		
Greece	17.3	22.3	19.0
Spain	14.1	20.8	17.5
Italy	10.0	12.7	10.5
Eurozone	7.6	10.4	8.9
France	8.5	10.4	10.4
US	3.7	10.4	9.1
Advanced Europe	6.6	9.2	7.9
China	3.6	4.3	3.8
Advanced Asia	3.1	4.1	3.7
Germany	3.2	3.9	3.5

Source: Own representation based on IMF (2020), World Economic Outlook, Statistical Annexes, April 2020; countries ranked according to projected results for 2020 (real GDP by largest decline, current account by largest surplus, unemployment rate by highest unemployment).

Appendix 9: Output Growth and the EIB Subsidization of Bank Loans

Output Growth and the EIB Subsidization of Bank Loans

For output growth (g is the growth rate, for the sake of simplicity capital depreciation is zero), one can write:

(1) $$g_Y = (I/Y)Y_K$$

where I is net investment, Y is output and YK is the marginal product of capital the basic;

Denoting bank equity by E, K' as total bank capital, the probability of non-default of firms' investment by f and the EIB's provisioning amount relative to bank capital by U (and ß for the profit ratio, t" for the corporate tax rate) – assuming df/dU>0 - we can write for investment:

(2) $$I = F\left(E'/K', f(U), ß(1-t")\right)Y$$

Or, with a linearized function (parameter n">0) and using positive parameters f' and f", one can write:

(3) $$I/Y = f'E'/K' + f"U + n"ß(1-t")$$

The money market equilibrium (with M denoting the stock of money, P the price level and h and h' positive parameters, r is the real interest rate; zero expected inflation is assumed) can be written as

(4) $$M/P = hY/(h'r)$$

Combining (1), (3) and (4) – considering profit maximization of firms (r= Y_K) gives:

(5) $$g_Y = \left(f'E'/K' + f"U + n"ß(1-t")\right)\left(hY/h'(M/P)\right)$$

The central bank follows a monetary policy rule (M/P)=v”Y – with v” as a positive parameter - so that we have the equation:

(6) $$g_Y = \left(f'E'/K' + f''U + n''ß(1-t'') \right)\left(h/(h'v'') \right)$$

The growth rate of output is a positive function of U where the relevant marginal impact is indicated by f”h/(h’v”). As the profit ratio ß:= H/Y – with H denoting real profits of firms – we can write finally (with h”:= h/h’):

(7) $$\frac{dY}{dt} = \left(f'E'/K' + f''U + n''ß''(1-t'') \right)\left(h''/v'' \right)Y$$

Note that the provisioning parameter U cannot be raised without limits since losses incurred by banks and taken over by a public bank have to be covered through a higher income tax rate or a higher corporate tax rate t” and if t” starts rising it is clear that the growth rate would reduce over time.

Debt-GDP Ratio Dynamics:

The government budget constraint (with G for real government expenditures, r real interest rate, t” income tax rate, B/P for real debt – with B nominal debt and P price level – and t for time index. The debt-GDP ratio (B/P)/Y is denoted by b’ and G:=g”Y (0<g”<1); and real output growth is g_Y) reads

(8) $$G + r(B/P) - t''Y = d(B/P)/dt$$

(if one divides by Y: d’ - b’g_Y = db’/dt where d’ is the deficit GDP ratio)

As db’/dt = (d(B/P)/dt)/Y – b’g_Y we get

(9) $$(g''' - t''') + (r - g_Y)b' = db'/dt$$

The first left-hand bracket (g”-t”) is the so-called primary deficit-GDP ratio (primary deficit is the deficit before interest payments). In an economic crisis, the growth rate of output is typically negative. Clearly the debt-GDP ratio can be reduced only – assuming that r=g_Y – if the primary surplus ratio is positive. If r exceeds the output growth rate, it holds that the required primary surplus ratio has to be the bigger the higher the gap r-g_Y is.

Let us denote the government consumption-GDP ratio by g and the public investment GDP ratio by g'; foreign variables are denoted by *. The debt-GDP ratio (b') will be stabilized if $g+g' - t'' = (g_Y(t'', r(b'), g', a) - r(b'))b'$.

Here, the real interest rate is a positive function of the debt-GDP ratio and output growth depends negatively on t'' and r, but positively on g' and a where a is the growth rate of technology. Let us assume that output growth can be written as $g_Y = V'g' - V''t'' - Vr + a$ (the parameters V', V'' and V are positive) and that $r = r^* + r'b'$ (r' is a positive parameter) so that we get

$$g + g' - t'' = \left(V'g' - V''t'' - V\left(r^* + r'b'\right) + a - r^* - r'b'\right)b' \Leftrightarrow$$

$$r'\left(V+1\right)b'^2 + \left(r^*\left(V+1\right) - a - V'g' + V''t''\right)b' + g + g' - t'' = 0 \quad (10)$$

$$b'^2 + \frac{\left(r^*\left(V+1\right) - a - V'g' + V''t''\right)b'}{r'\left(V+1\right)} + \frac{g + g' - t''}{r'\left(V+1\right)} = 0 \quad (11)$$

It is assumed that the second right-hand bracket in equation (11) is negative and the third term is positive or zero. The minimization of b' requires certain conditions (and a positive second derivative). The solution of the quadratic equation is:

$$b'_{1,2} = -\left(\frac{\left(r^*\left(V+1\right) - a - V'g' + V''t''\right)/\left(r'\left(V+1\right)\right)}{2}\right) +/- \left[\left(\frac{\left(r^*\left(V+1\right) - a - V'g' + V''t''\right)/\left(r'\left(V+1\right)\right)}{2}\right)^2 - \frac{g + g' - t''}{r'\left(V+1\right)}\right]^{\frac{1}{2}} \quad (12)$$

Appendix 10: Deficit to GDP Ratios and Debt to GDP Ratios for Selected Euro Area Countries, plus UK and US, 1999-2018

Table 8: Deficit to GDP Ratio for Selected Euro Area Countries, plus UK and US, 1999-2018

	1999	2004	2009	2014	2018
Euro Area	-1.5	-2.9	-6.2	-2.5	-0.5
Belgium	-0.6	-0.2	-5.4	-3.1	-0.7
Germany	-1.7	-3.3	-3.2	0.6	1.9
Estonia	-3.3	2.3	-2.2	0.7	-0.6
Ireland	3.5	1.3	-13.8	-3.6	0.1
Greece	-5.8	-8.8	-15.1	-3.6	1.0
Spain	-1.2	-0.1	-11.3	-5.9	-2.5
France	-1.6	-3.6	-7.2	-3.9	-2.5
Italy	-1.8	-3.5	-5.1	-3.0	-2.2
Cyprus	-4.0	-3.7	-5.4	-8.7	-4.4
Latvia	-3.7	-0.9	-9.5	-1.4	-0.7
Lithuania	-2.8	-1.4	-9.1	-0.6	0.6
Luxemburg	3.5	-1.3	-0.7	1.3	2.7
Malta	-6.7	-4.3	-3.2	-1.7	1.9
Netherlands	0.3	-1.8	-5.1	-2.2	1.5
Austria	-2.6	-4.8	-5.3	-2.7	0.2
Portugal	-3.0	-6.2	-9.9	-7.4	-0.4
Slovenia	-3.0	-1.9	-5.8	-5.5	0.8
Slovakia	-7.2	-2.3	-8.1	-3.1	-1.1
Finland	1.7	2.2	-2.5	-3.0	-0.8
United Kingdom	0.6	-3.1	-10.1	-5.6	-2.3
US*	1.3	-3.4	-9.8	-2.8	-3.8

*Source: Own representation of data available from Eurostat, *= US data from Federal Reserve St. Louis, FRED*

Table 9: Debt to GDP Ratios for Selected Euro Area Countries, plus UK and US, 1999-2018

	1999	2004	2009	2014	2018
Euro Area	***	69.6	80.2	92.8	85.9
Belgium	115.4	97.2	100.2	107.0	100.0
Germany	60.1	65.0	73.0	75.7	61.9
Estonia	6.4	5.1	7.2	10.6	8.4
Ireland	46.6	28.2	61.5	104.4	63.6
Greece	98.9	102.9	126.7	178.9	181.2
Spain	60.8	45.4	53.3	100.7	97.6
France	60.5	65.9	83.0	94.9	98.4
Italy	113.3	105.1	116.6	135.4	134.8
Cyprus	55.8	64.8	54.3	109.2	100.6
Latvia	12.1	14.1	36.2	40.9	36.4
Lithuania	22.7	18.7	28.0	40.6	34.1
Luxemburg	***	7.3	15.7	22.7	21.0
Malta	62.1	71.9	67.6	63.4	45.8
Netherlands	58.6	50.3	56.8	67.8	52.4
Austria	66.7	65.2	79.9	84.0	74.0
Portugal	55.4	67.1	87.8	132.9	122.2
Slovenia	23.7	26.9	34.5	80.3	70.4
Slovakia	47.1	41.7	36.4	53.5	49.4
Finland	44.1	42.6	41.5	59.8	59.0
United Kingdom	39.5	38.4	63.3	86.2	85.9
US	58.7	60.4	82.4	101.7	104.5

Source: Own representation of data available from Eurostat, US data from Federal Reserve St. Louis, FRED

Appendix 11: Fitch Ratings on Italy - Downgrading of Government Bonds

https://www.fitchratings.com/research/sovereigns/fitch-downgrades-italy-to-bbb-outlook-stable-28-04-2020, accessed May 1, 2020

"Fitch Ratings - Frankfurt am Main - 28 Apr 2020: Fitch Ratings has downgraded Italy's Long-Term Foreign-Currency Issuer Default Rating (IDR) to 'BBB-' from 'BBB'. The Outlook is Stable.

A full list of rating actions is at the end of this rating action commentary.

Under EU credit rating agency (CRA) regulation, the publication of sovereign reviews is subject to restrictions and must take place according to a published schedule, except where it is necessary for CRAs to deviate from this in order to comply with their legal obligations. Fitch interprets this provision as allowing us to publish a rating review in situations where there is a material change in the creditworthiness of the issuer that we believe makes it inappropriate for us to wait until the next scheduled review date to update the rating or Outlook/Watch status. The next scheduled review date for Fitch's sovereign rating on Italy will be 10 July 2020, but Fitch believes that developments in the country warrant such a deviation from the calendar and our rationale for this is laid out below.

In accordance with Fitch's policies, the issuer appealed and provided additional information to Fitch that resulted in a rating action that is different than the original rating committee outcome.

KEY RATING DRIVERS

The downgrade of Italy's IDRs reflects the following key rating drivers and their relative weights:

High

The downgrade reflects the significant impact of the global COVID-19 pandemic on Italy's economy and the sovereign's fiscal position. Fitch forecasts an 8% GDP contraction in 2020 and the risks to this baseline forecast are tilted to the downside, as it assumes that the coronavirus can be contained in 2H20, leading to a relatively strong economic recovery in 2021. In the event of a second wave of infections and the widespread resumption of lockdown measures, economic outturns would be weaker for 2020 and 2021.

The gross general government debt (GGGD) to GDP ratio will increase by around 20pp this year. Our baseline GGGD forecast is 156% of GDP by at the end of 2020, compared with the 'BBB' current median of 36% of GDP. According to our baseline debt dynamics scenario, the GGGD to GDP ratio will only stabilise at this very high level over the medium term, underlining debt sustainability risks.

The Stable Outlook partly reflects our view that the ECB's net asset purchases will facilitate Italy's substantial fiscal response to the COVID-19 pandemic and ease

refinancing risks by keeping borrowing costs at very low levels at least over the near term. Nevertheless, downward pressure on the rating could resume if the government does not implement a credible economic growth and fiscal strategy that enhances confidence that general government debt/GDP will be placed on a downward path over time.

Medium

The Italian economy was already in a weak position when the COVID-19 shock hit. Real GDP grew by only 0.3% in 2019. The economy has effectively stagnated over the past two years, with qoq growth rates in the narrow -0.1/+0.1% range during most of 2018 and 2019, before a contraction (-0.3%) in 4Q19. The five-year average real GDP growth rate is 1%, compared with 1.9% in the eurozone and the current 'BBB' five-year average of 3.6%. The 2010-2019 average annual nominal GDP growth rate, a key metric for debt sustainability, is 1.3%, compared with 2.5% in the eurozone. Tourism, which accounts for 5.5% of GDP according to the World Travel and Tourism Council, represents a downside risk to the growth outlook.

The recession and the economic policy response to the COVID-19 pandemic will result in a sizeable deterioration of the budget balance this year. The government announced EUR25 billion of short-term fiscal support measures on 17 March, focusing on the direct impact of the health crisis. Fitch expects larger overall fiscal easing during 2020, including extra healthcare expenditure, lower social security contributions and subsidies for job protection, which would lead to a budget deficit close to 10% of GDP in 2020 compared with the better than previously expected 1.6% of GDP deficit in 2019. Credit guarantee schemes to the private sector could reach EUR400 billion (approximately 25% of GDP), which would be a contingent liability for the sovereign.

The risks around the baseline debt dynamics scenario are tilted to the downside. Beyond the macroeconomic risks, historically, the GGGD ratio has turned out to be consistently higher than forecast in the consecutive stability programmes or the budget plans of the government.

The size (EUR750 billion) and flexibility of the ECB's Pandemic Emergency Purchase Programme (PEPP) reduces refinancing risks for Italy in the short term and will help facilitate its fiscal response to the crisis. Lower bond yields and an extended period of quantitative easing are set to support creditworthiness as they reduce the interest service burden. However, in Fitch's view, low bond yields partly reflect low nominal GDP growth prospects and do not provide unlimited support to sovereign ratings, either in terms of a particular rating level or for an unlimited time period. The fiscal space created by lower interest service costs since 2015 has not been used to reduce the stock of debt and finance growth-enhancing reforms: GGGD at end-2019 stood at 134.8%, only 0.5pp below its 2015 level. In Fitch's view, lower for longer yields will also reduce incentives for future governments to make public debt reduction and growth-enhancing structural reforms a political priority.

Italy's 'BBB-' IDRs also reflect the following key rating drivers:

The rating is supported by a diversified, high value-added economy, with GNI per capita, governance and human development indicators much stronger than the peer group medians.

Fitch forecasts 3.7% GDP growth in 2021, reflecting a technical rebound after the COVID-19 shock this year. The strength of the recovery beyond 2021 is highly uncertain, given the underlying weaknesses of the economy. The poor performance following the global financial crisis, when only around half of the lost output was regained by 2012, is also a cautionary sign.

The Italian private sector has some buffers to withstand the sharp short-term deterioration in the economic outlook. Italy has experienced improvement in both household and corporate sector financial balances since 2012. Household debt is extremely low (53% of GDP in 3Q19) and net financial wealth (financial assets minus financial liabilities) at 195% of GDP is well above the level across the eurozone (153%).

Italy demonstrated broad political cohesion during the first weeks of the COVID-19 pandemic, similar to most developed countries. The support for the coalition government of the FiveStar Movement and the Democratic Party has increased and Prime Minister Conte has the highest approval rating since he entered office. However, political tensions have resurfaced in recent weeks. We believe political tensions will intensify as the lockdown measures are gradually relaxed and political focus shifts to the economy and the European common response to the crisis.

The European Council of Ministers on 23 April gave the European Commission a mandate to draw up plans to establish a recovery fund to support post-crisis recovery. The Council has also agreed to establish a temporary unemployment reinsurance scheme (SURE), a pan-European guarantee fund of EUR25 billion backed by the European Investment Bank and the ESM precautionary credit line (worth 2% of each country's GDP and without conditionality). So far decisions at the European level on how to address the economic consequences of the health crisis have been politically sensitive in Italy. The Italian government appears to have welcomed the conclusion of the summit but political differences across Italy's political parties around the use of the ESM are likely to persist.

The recovery fund will be "targeted towards the sectors and geographical parts of Europe most affected". These would include Italy. Fitch understands that there are disagreements among member states on the financing of the fund, particularly about whether the fund would deliver assistance in the form of grants or loans. Other uncertainties are the size of the fund, the speed of its disbursement and the effectiveness of its impact in promoting a broad-based recovery.

The average maturity of the GGGD is 6.96 years, providing a buffer to absorb market shocks in the short term. The average cost of debt fell to 2.5% in 2019 from a peak of 4.4% in 2012, as the average annual issuing yield of the medium- to long-term debt was 1.6%. After a surge in mid-March, the 10 year yield has been below 2% since the ECB's PEPP programme was announced on 18 March.

The current account surplus is estimated at 3.0% of GDP in 2019 and we forecast surpluses around 1% of GDP in 2020 and 2021, compared with a current 'BBB' median deficit of 1.8% of GDP. Italy's net international investment position (NIIP) was close to balance (-4.7% of GDP) at end-2018, down from a peak of -23.3% of GDP at end-2013. Net external debt, which excludes equity and investment fund shares, was 51.7% of GDP in 2019 compared with the 'BBB' median of 6.6%.

The banking sector outlook has deteriorated after the COVID-19 shock relative to our previous expectations of a stabilisation in performance and further asset quality improvement in 2020. Fitch has revised down the sector outlook to negative from stable and also revised the outlook on the assessment of the operating environment for the banks to negative from stable in March 2020. The deep recession will likely amplify credit quality risks and put pressure on earnings and profitability for the banking sector. Government support measures for the corporate and household sectors, including government guarantees on loans to SMEs, should partly support asset quality and to some extent mitigate the adverse impact on banks.

ESG - Governance: Italy has an ESG Relevance Score (RS) of 5 for both Political Stability and Rights and for the Rule of Law, Institutional and Regulatory Quality and Control of Corruption, as is the case for all sovereigns. Theses scores reflect the high weight that the World Bank Governance Indicators (WBGI) have in our proprietary Sovereign Rating Model. Italy has a WBGI ranking at the 67.5 percentile, reflecting relatively strong institutional capacity, effective rule of law and lower political stability score.“

Appendix 12: WHO and Partners Launch New Initiative "Access to Covid-19 Tools (19) Accelerator"

On April 24, 2020 the WHO and partner organizations have launched a new initiative "Access to Covid-19 Tools (19) Accelerator"; the following text is from the WHO website:

"Our Vision and Mission

Grounded in a vision of a planet protected from human suffering and the devastating social and economic consequences of COVID-19, we, an initial group of global health actors (BMGF, CEPI, Gavi, Global Fund, UNITAID, Wellcome Trust, WHO) and private sector partners and other stakeholders, are launching a landmark, global and time-limited collaboration to accelerate the development, production and equitable global access to new COV- ID-19 essential health technologies.

We know that as long as anyone is at risk from this virus, the entire world is at risk – every single person on the planet needs to be protected from this disease.

We agree that alongside evidence-based public health measures, innovative COVID-19 diagnostics, therapeutics and vaccines are needed – in record time and at record scale and access – to save millions of lives and countless trillions of dollars, and to return the world to a sense of 'normalcy'.

We recognize the significant amount of critical work, investment and initiatives already ongoing around the world to expedite the development and deployment of innovative COVID-19 related products and interventions.

We appreciate that while development and deployment of innovative products is essential, it will not be enough. We must simultaneously and urgently accelerate the strengthening of sustainable health systems and capacities to enable delivery of the new COVID-19 tools to those who need them and to mitigate the knock-on impact on other diseases.

We remember lessons from the past, which have shown that even when effective tools are available to the world, too often some are protected, while others are not. This inequity is unacceptable – all tools to address COVID-19 must be available to all. In the fight against COVID-19, no one should be left behind.

Our Mission is not only accelerated development and availability of new COVID-19 tools – it is to accelerate equitable global access to safe, quality, effective, and affordable COVID-19 diagnostics, therapeutics and vaccines, and thus to ensure that in the fight against COVID-19, no one is left behind.

Our Commitment

1. We commit to the shared aim of equitable global access to innovative tools for COVID-19 for all.

2. We commit to an unprecedented level of partnership – proactively engaging stakeholders, aligning and coordinating efforts, building on existing collaborations,

collectively devising solutions, and grounding our partnership in transparency, and science.

3. We commit to create a strong unified voice to maximize impact, recognizing this is not about singular decision-making authority, but rather collective problem-solving, interconnectedness and inclusivity, where all stakeholders can connect and benefit from the expertise, knowledge and activities of this shared action-oriented platform.

4. We commit to build on past experiences towards achieving this objective, including ensuring that every activity we undertake is executed through the lens of equitable global access, and that the voices of the communities most affected are heard.

5. We commit to be accountable to the world, to communities, and to one another. We are coming together in the spirit of solidarity, and in the service of humanity, to achieve our mission and vision.

We understand we cannot do this alone, and that we need to work together in unprecedented and inclusive partnership with all stakeholders – political leaders, public and private sector partners, civil society, academia, and all other stakeholders across society – jointly leveraging our comparative strengths and respective voices to drive towards collective solutions, an accelerated path, and access for all. We are stronger, faster and more effective working together."

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