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The shape of recovery: Implications of past experience for the duration of the COVID-19 recession

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ABSTRACT

In this paper we seek to make headway on the question of what recovery from Covid-19 recession may look like, focusing on the duration of the recovery – that is, how long it will take to re-attain the levels of output and employment reached at the prior business cycle peak. We start by categorizing all post-1960 recessions in advanced countries and emerging markets into supply-shock, demand-shock and both-shock induced recessions. We measure recovery duration as the number of years required to re-attain pre-recession levels of output or employment. We then rely on the earlier literature on business cycle dynamics to identify candidate variables that can help to account for variations in recovery duration following different kinds of shocks. By asking which of these variables are operative in the Covid-19 recession, we can then draw inferences about the duration of the recovery under different scenarios. A number of our statistical results point in the direction of lengthy recoveries.

1. Introduction

The macroeconomic consequences of the COVID-19 pandemic are playing out in real time. Initially, attention focused on the unprecedented magnitude of the global recession. As the IMF (2020) noted already in April, barely a month into the outbreak, the 2020 downturn was the sharpest recession experienced by the global economy since the Great Depression of the 1930s. The contraction in global GDP, forecast to equal -3 per cent year over year, significantly exceeded the contraction in the Global Financial Crisis of 2008-9. It far exceeded the hardships experienced by emerging and developing Asia during their financial crisis in 1998, when GDP growth fell year over year but remained positive, still running at 2.8% regionally. In the pandemic, in contrast, not just the global scope but also the speed of the contraction were breathtaking: China saw its GDP contract by nearly 7% in 2020 Q1 alone; most OECD economies as well as major emerging markets, including Brazil, India, Russia and South Africa, saw even larger contractions in 2020 Q2.

Attention turned next to the prospects for recovery. Here the outlook was (and, at the time of writing, remains) uncertain. On one side were those who forecast a quick V-shaped recovery. They argued that the Covid recession was not the result of the sorts of factors that had led to extended recessions in the past. It was not the result of an increase in global interest rates, a financial crisis, or a sharp rise in global energy costs. It was not the legacy of a credit boom that caused banks to become overextended, requiring them to

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deleverage and leading to an extended period of depressed investment. Rather, it reflected the decision of governments to lock down populations and put the economy into suspended animation. It was argued that, consequently, once the spread of the virus had been contained by the lockdown, it would be possible for economies to pick up where they had left off. There was no reason why activity couldn't resume immediately, in other words, and rebound quickly to the same levels as before.

At the same time, there were others who warned that even a temporary lockdown could cause lasting macroeconomic damage and who therefore forecast an extended U-shaped recovery. Households reminded of the inadequacy of their precautionary savings might reduce their spending for a lengthy period, even permanently, in order to build up larger financial buffers. Firms would hesitate to invest until they had a better sense of the shape of the post-COVID economic landscape. Firms and governments, having been left more heavily indebted, might feel compelled to deleverage for an extended period. Bankruptcies and nonperforming loans, if left unaddressed, could impair bank balance sheets, adding a layer of financial stress and disfunction. Pre-existing connections between workers and employers would be lost, destroying the value of firm-specific skills and requiring time for new connections to be formed. Recovery, in this view, was not as simple as flipping a switch.

Superimposed on these scenarios were two further complications. First and foremost, there was the epidemiology of COVID-19. This Coronavirus being novel, no one knew how it would be affected by temperature and humidity, how easily it would be spread, or whether contagious new vaccine-resist variants would appear. It was uncertain whether there would be a second or third wave, transforming a U- or V-shaped recovery into a W.

Second, it is not clear whether to conceptualize the COVID-19 recession as a supply shock, a demand shock, or a combination of the two. Advocates of the V-shaped recession hypothesis tended to think of it as a temporary negative supply shock. Since the lockdowns that gave rise to the recession were temporary and could be removed abruptly, recovery was likely to be quick, in this view. But there are also those who point to much longer lived supply-side effects, due to disruptions to global supply chains, resurgent protectionism, and the loss of age-critical education and human capital formation due to school closures. Negative supply shocks of this sort are not easily offset, of course, by conventional demand-management policies.

Others emphasize the reduction in demand as incomes are lost in COVID-19 lockdowns. Here demand-management policies helped to mitigate the effects of the shock, but to differing extents in different economies. In advanced countries, central banks have undertaken asset purchases on a scale that dwarfs even those of 2009–10, while governments have adopted fiscal initiatives that replace – in some cases more than replace – the decline in disposable incomes. Emerging markets and developing countries possess less monetary and fiscal policy space, but they have nonetheless used monetary and fiscal policies more aggressively than in previous downturns, reflecting their progress in building up monetary-policy credibility and fiscal capacity. Nonetheless, these considerations highlight the high uncertainty surrounding the scope for policy to mitigate the downturn and sustain any subsequent recovery.

A final complication is that there is no direct historical precedent or available data set on earlier recessions taking place as a result of similar shocks to which to look. The 1918-19 Spanish flu pandemic and recession is a parallel (Garrett 2007, Beach, Clay and Saavedra 2020, Velde 2020), but it occurred in a very different institutional setting. Other recessions feature the negative aggregate-supply and aggregate-demand shocks characteristic of COVID-19 in very different combinations.

In this paper we seek to make headway on the question of what recovery from the COVID-19 recession will look like, focusing on the duration of the recovery – that is, how long it will take to re-attain the levels of output and employment reached at the prior business cycle peak. Focusing on the duration of the recovery rather than the shape (V, U or W) allows us to circumvent epidemiological uncertainties. To be sure, epidemiological issues such as whether or not there is a second wave are also likely to affect the duration of recovery, but it is possible, as we show below, to analyze and identify the determinants of recovery duration following various categories of shocks independent of epidemiology.

We start by categorizing all post-1960 recessions in advanced countries and emerging markets into supply-shock, demand-shock and both-shock induced recessions. We measure recovery duration as the number of years required to re-attain pre-recession levels of output or employment. We then rely on the literature on business cycle dynamics to identify candidate variables that can help to account for variations in recovery duration following different kinds of shocks. By asking which of these variables are operative in the COVID-19 recession, we can then draw inferences about the duration of the recovery under different scenarios.

Our paper is related to several literatures. First, there is a literature using structural econometric models to extract estimates of aggregate-supply and aggregate-demand shocks from macroeconomic time series (Blanchard and Quah 1989, Bayoumi and Eichengreen 1993, 2020). Blanchard and Quah impose the identifying restriction that aggregate demand shocks affect levels of output only temporarily, while aggregate supply shocks affect them permanently. Bayoumi and Eichengreen check the implicit restriction that negative supply shocks, in addition to reducing output, should raise the level of prices or the rate of inflation, while negative demand shocks should reduce prices and/or inflation. We use similar methods here to categorize recessions into those that are demand-, supply-, or both-shock driven.

Second, there is the literature directly concerned with the length of recoveries. Stock and Watson (2012), focusing on the United States, suggest that a slowing trend rate of growth has been associated with slower recovery (longer recovery duration) over the course of the 20th century. Olney and Pancitti (2017) also focus on the US and document that there has been a tendency over time for recoveries to take longer. They associate this with the rise of the service sector, arguing that services, unlike goods, cannot be produced ahead of demand, so there is less scope for inventory accumulation to initiate early recovery in service-heavy economies, and that most services can't be exported, so there is less scope in service-based economies for exports to spur recovery. A possible implication is that

recovery should take longer in advanced economies than emerging markets and developing countries where employment is less service dependent.

Other authors (viz. Reinhart and Rogoff 2009, Kannan, Scott and Terrones 2009) suggest that recoveries take longer when the preceding recession is marked by a financial crisis. Similarly, Jorda et al. (2013) point to credit booms in the preceding expansion as auguring more gradual recoveries. Kannan, Scott and Terrones find that recoveries from global recessions (when many economies are in recession simultaneously) tend to be lengthy and weak.

Third, there is the literature concerned with changes in the effectiveness of demand-management policies. Bivens (2015) describes how interest rates have declined secularly across a range of advanced countries and emerging markets, and suggests that this has left less scope for conventional monetary policies to support recovery. Others point to the diminished capacity of expansionary fiscal policy to stimulate recovery when governments are already heavily indebted (see Kannan, Scott and Terrones 2009 and Nickel and Tudyka, 2013).

Fourth, there is a literature on the duration of recovery under alternative exchange rate regimes. Hegarty and Wilson (2017) compare recoveries in countries with pegged and flexible exchange rates. They find little difference by regime for the entire period they consider but some evidence that countries with flexible rates recovered more quickly starting with the Global Financial Crisis. Whether this is a result specific to euro area countries (which dominate their sample of post Global Financial Crisis recoveries) or a more general finding is unclear, however. Tsangarides (2010) looks specifically on emerging markets in the Global Financial Crisis, and reports limited evidence of faster recoveries in economies with flexible rates. Terrones (2019) focuses on recoveries from global recessions, finding that countries with flexible exchange rates recover more quickly from global downturns. Cerra, Panizza and Saxena (2009) find that a flexible exchange rate is associated with stronger growth during recoveries.[1] Related to this, Deb (2005) finds that a range of export-related variables have a strong impact in shaping the duration of recoveries from currency crises: these variables include higher output growth in trade partners, a well-diversified export base and improvements in export competitiveness.

Finally, there is literature concerned with the relative speed of recovery of output and employment (both of which we consider here). Jaimovich and Siu (2012) focus on jobless recoveries – the tendency for output to recover more quickly than employment – which they attribute to a decline in middle-skill jobs. Groshen and Potter (2003) attribute the slow recovery of employment compared to output to the extent of the structural changes associated with recession – to the permanent contraction of some sectors and lags with which other sectors take on those redundant workers – a scenario that is directly relevant to the aftermath of the Covid-19 downturn.

2. Data and variables

We gathered annual data back to 1950 where possible from Penn World Tables 9.1, IMF, World Bank and OECD sources.[2] Table 1 lists the countries in the sample. Our indicator of financial crises was taken from Reinhart and Rogoff (2009) and Laeven and Valencia (2018), suitably updated, and our measure of the de facto exchange rate regime from Ilzetzki, Reinhart and Rogoff (2019). Definitions and sources of data are listed in Table A1.

We identified recessions and recoveries using the Bry and Boschan (1971) algorithm as coded by Jorda et al. (2013) for both advanced economies and emerging markets. This basically looks for local minima for the series for real GDP per capita in levels. In practice it very closely approximates the dates called by the National Bureau of Economic Research Business Cycle Dating Committee. Table A2 lists the resulting recovery episodes. It details the year each recession starts, the amplitude of the peak to trough fall in GDP per capita in percentage terms, and the amplitude of the comparable fall in employment again in percentage terms. Note that in some cases employment never declines (the values listed are positive).

We then show the duration in years of the recovery to their previous peak of per capita GDP and employment, respectively, in years, where a value of zero indicates that employment never declined in the recession. Alternatively, we counted the number of years required to reach the path of GDP and employment, projected on the basis of the pre-crisis trend.[3] The column after that then lists the difference in years between the peaks of per capita GDP and employment. Note that in cases where employment continued to increase more than two years after the recession started, we entered a value of zero for the duration of the recovery of employment (equivalent to assuming no decline in the level of employment).

In addition, we indicate whether there was a double dip recession and the number of other countries also experiencing a recession in the same year. In what follows, we identify global recessions using the criterion (as in Kannan, Scott and Terrones 2009) that at least ten advanced economies should be in a recession simultaneously in order for an event to qualify as a global recession.[4]

Classifying recessions as supply- and demand-shock driven requires further transforming the data. We use the method of Blanchard and Quah (1989) to identify supply and demand shocks, but follow Bayoumi and Eichengreen (1993) in estimating structural vector

[1] They also find that trade openness is associated with slower recovery, which is a little hard to square with the finding for exchange rates. We return to this below.

[2] While real GDP per capita is available for advanced economies from 1950, the starting year varies for emerging markets. The list of 23 advanced economies and 23 major emerging markets, and the starting year is available in Table 1.

[3] We extrapolated using an HP filter. Results in this case are remarkably similar to those reported in the text. These are available from the authors on request.

[4] When we increase this threshold from 10 to 15 countries, very little of what we describe below changes.

Table 1
List of Advanced and Emerging Economies and the Starting Years of GDP per capita and Employment in the Sample.

Advanced Economies	
Australia (1950, 1950)	Austria (1950, 1950)
Belgium (1950, 1950)	Canada (1950, 1950)
Denmark (1950, 1950)	Finland (1950, 1950)
France (1950, 1950)	Germany (1950, 1950)
Greece (1951, 1951)	Iceland (1976, 1976)
Ireland (1950, 1950)	Italy (1950, 1950)
Japan (1950, 1950)	Luxembourg (1950, 1950)
Netherlands (1950, 1950)	New Zealand (1950, 1950)
Norway (1950, 1950)	Portugal (1950, 1950)
Spain (1950, 1950)	Sweden (1950, 1950)
Switzerland (1950, 1950)	United Kingdom (1950, 1950)
United States (1950, 1950)	
Emerging Markets	
Brazil (1950, 1950)	Chile (1951, 1951)
China (1952, 1952)	Colombia (1950, 1950)
Czech Republic (1990, 1990)	Estonia (1990, 1990)
Hungary (1970, 1970)	India (1950, 1950)
Indonesia (1960, 1960)	Israel (1950, 1950)
Latvia (1990, 1990)	Malaysia (1955, 1955)
Mexico (1950, 1950)	Peru (1950, 1950)
Philippines (1950, 1950)	Poland (1970, 1970)
Republic of Korea (1953, 1953)	Russian Federation (1990, 1990)
Slovakia (1990, 1990)	Slovenia (1990, 1990)
South Africa (1950, 1950)	Thailand (1950, 1950)
Turkey (1950, 1950)	

Notes: Advanced economies are countries that accessed to OECD initially in 1960 and within next 12 years except for Turkey which is considered as an emerging market. Emerging markets are the rest of OECD countries and 15 major emerging markets based on International Monetary Fund (IMF), Dow Jones, Russell, Standard & Poor's and Morgan Stanley Capital International (MSCI). The first and second years in parentheses are the starting years of GDP per capita and employment, respectively, in the sample.
Sources: Authors.

autoregressions on data for inflation and growth (as opposed to employment and growth).[5] This allows us to estimate whether supply and demand shocks were positive or negative in each year. We sum up aggregate supply and demand shocks during a recession and define a supply-shock driven recession if the sum of aggregate supply shocks is negative and the sum of aggregate demand shocks is positive. The opposite case is defined as a demand-shock driven recession. Finally, if both sums are negative, the case is defined as a recession driven by both shocks.

3. Basic patterns

Figs. 1-6 show the basic patterns in our data, disaggregated by decade and type of shocks. In Fig. 1 for all countries, for example, we show the recovery duration of per capita GDP and employment (how many years it takes for the two variables to recover to their levels at the preceding business cycle peak). We show several variants for employment, since in some recessions this variable never declines (as explained earlier) and since it sometimes takes more than two business cycle peaks to recover to that prior level. The first variant, in yellow, reports the average duration of employment recovery when we remove cases where it takes more than two peaks to recover. The second variant, in orange, reports the average where we instead include these cases. The third variant, in grey, reports the average duration where we remove cases where employment never declines (the zero duration cases).

Over the entire sample, then, it takes real GDP per capita a little over four years to recover the prior peak. We observe the tendency, noted previously, for recoveries to grow longer, from less than three years on average in the 1950s to close to 4 ½ years starting in the 1970s (a 50% increase).[6] However, this pattern is far from monotonic: recovery duration is longest in the 1980s (with the lost decade in Latin America) and 2000s (with the onset of the Global Financial Crisis). Over the entire sample and all countries, it takes three years for employment to recover to the previous peak, one year faster than for per capita GDP.[7] The longest durations for this variable are in

[5] We use detrended real GDP and CPI index by again applying a linear trend with different slopes before and after 1973. The lag length of the VAR is 8.

[6] The literature highlighting this tendency focuses on the U.S. Here we show it to be more general.

[7] Employment shows a tendency to recover more slowly than output in many settings. Recall, however, that our international sample also includes recession observations where employment doesn't fall. Recovery duration in this case equals zero, which accounts for shorter recovery length. The figure shows that we obtain the conventional result (that it takes longer for employment to recover) when we exclude these zero duration cases.

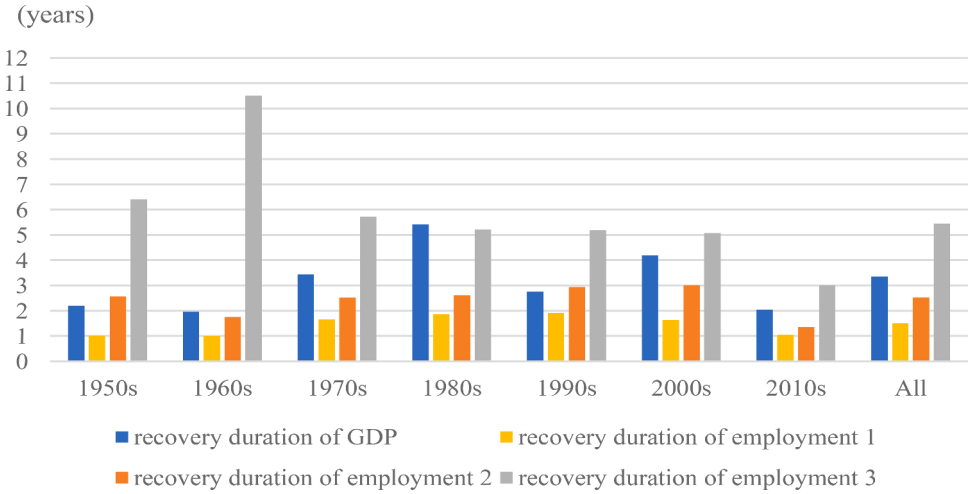

Fig. 1. Length of Years to Recover to Pre-Crisis Peak Level of Real GDP and Employment
Notes: Recovery duration refers to the length of years to recover to pre-crisis peak. We report the average duration of recovery of both real GDP per capita and employment by decades, with the average duration for all years at the right end. While real GDP per capita recovers at least before it reaches the next two peaks, employment sometimes takes more than two peaks to completely recover. Furthermore, sometimes employment never declines during the recession in which case we set the duration equal to zero. Henceforth we report three versions of average duration of employment to recover. The first version (yellow) reports the average duration of employment recovery when we remove the case where it takes more than two peaks to recover. The second version (orange) reports the average duration when we include the case where it takes more than two peaks to recover. Finally, the third version (grey) reports the average duration when we further remove the case where employment never declines (i.e. zero duration).
Sources: Authors' calculations

the 1980s, 1990s and 2000s – interestingly, not in the 2010s. When we exclude cases where employment never declines, we see a monotonic fall in recovery durations from the 1960s through the 2010s, contrary to the widespread presumption that jobless recoveries have grown more prevalent.[8]

Fig. 2 distinguishes global and other recessions. Not surprisingly, it takes per capita GDP and employment longer to recover in global recession cases (there were no global recessions in the high-growth 1950s and 1960s according to our measure). GDP recovery times were longest in the global recessions of the 1980s (Latin America's lost decade but also when multiple OECD economies experienced synchronized recessions) and in the 2000s (again reflecting the Global Financial Crisis).

Fig. 3 distinguishes supply-shock, demand-shock, and both-supply-and-demand shock cases. Over the entire sample period, per capita GDP recovery durations are slightly longer following supply-shock- than demand-shock-related recessions. The same is true of employment recoveries if one uses our second (orange) variant that includes all recessions. The long duration of GDP recoveries from demand-induced recessions in the 1980s also stands out. Recall that this was when the sharp increase in interest rates in the United States and declining capital flows to emerging markets resulted in the lost decade.[9]

Figs. 4 and 5 show, again intuitively, that double dip recessions are following by longer recovery duration, most prominently in the 1970s and 1980s (and, for employment, also in the 1990s) but more generally as well. Finally, Fig. 6 confirms that recovery from recessions that feature financial crises takes longer. This stylized fact is evident throughout but most dramatically for GDP in the 1970s and 1980s.

[8] There were of course a substantial number of cases in the 1960s where employment never declined, this being a high-growth decade. The very large average value for the recessions that remain reflect a handful of problem cases: Canada in 1956 and Spain in 1958 (5 years for employment to recover) and Greece in 1961 (19 years for employment to recover).

[9] There were eight recessions identified for the U.S. All of them turned out to be both supply- and demand-shock driven, except for the recessions in 1973 and 1979, which the method classifies as supply-shock cases. This suggests that historical evidence of the sort we employ in this paper should have some explanatory power for the Covid-19 recession, given that this was associated with both supply and demand shocks.

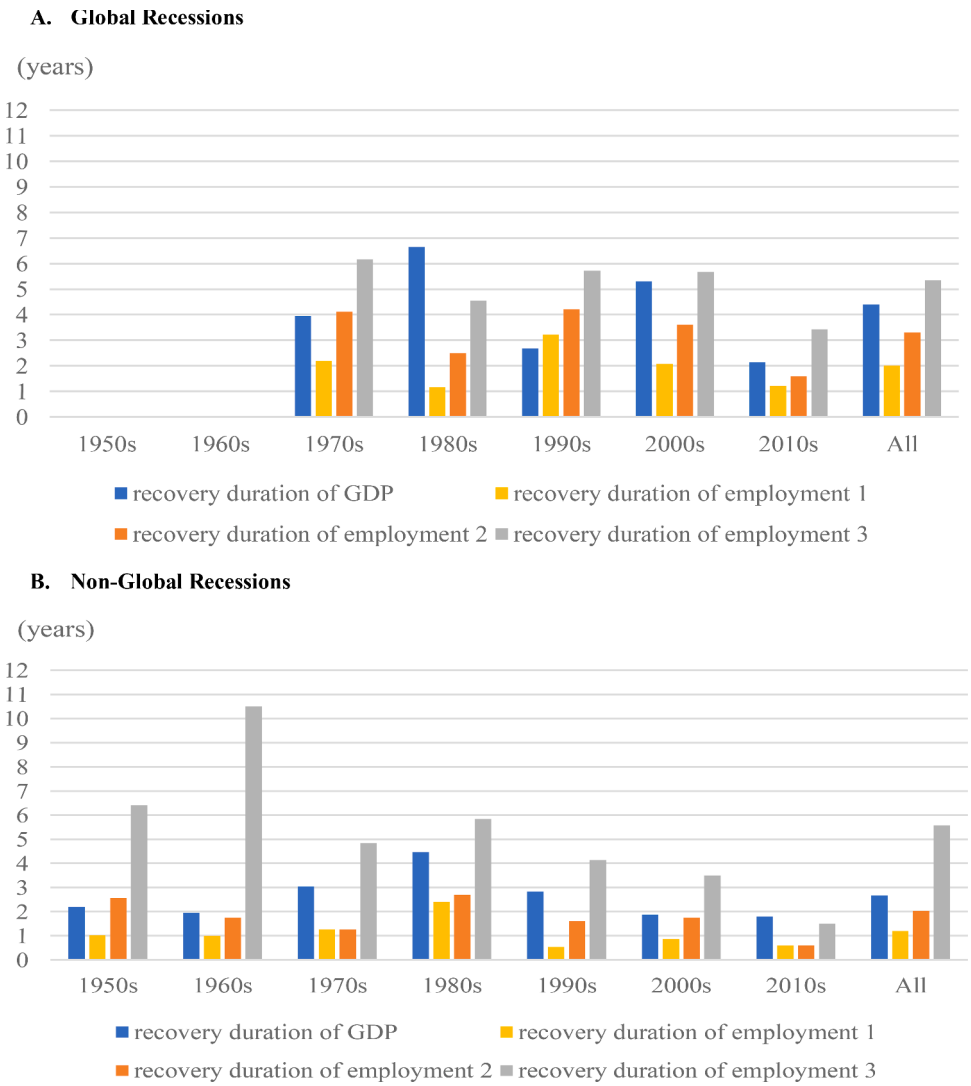

Fig. 2. Comparison of Recoveries from Global and Non-Global Recessions

4. Regression analysis

We turn now to regression analysis. Table 2 shows the variance-covariance matrix of our basic variables. Some of these – stock

Fig. 3. Comparison of Recoveries from Recessions Driven by Supply, Demand and Both Shocks.

market capitalization and private debt, for example, or trade openness and financial openness – are fairly highly correlated, which should alert us to the possibility of multicollinearity.

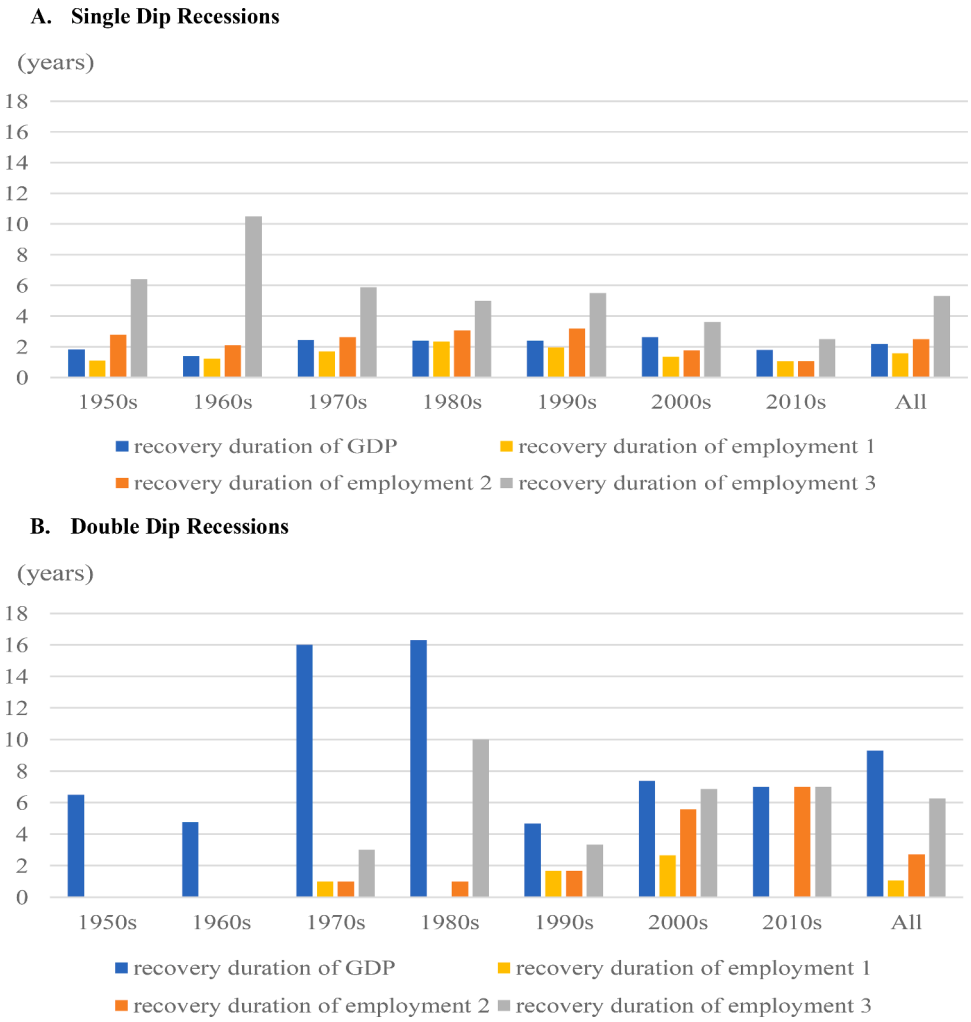

Fig. 4. Comparison of Recoveries from Single Dip and Double Dip Recessions
Notes: A single dip recession is when real GDP per capita recovers before the next peak. A double dip recession is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. As in Figure 1, we report the average duration of employment recovery for three versions.
Sources: Authors' calculations.

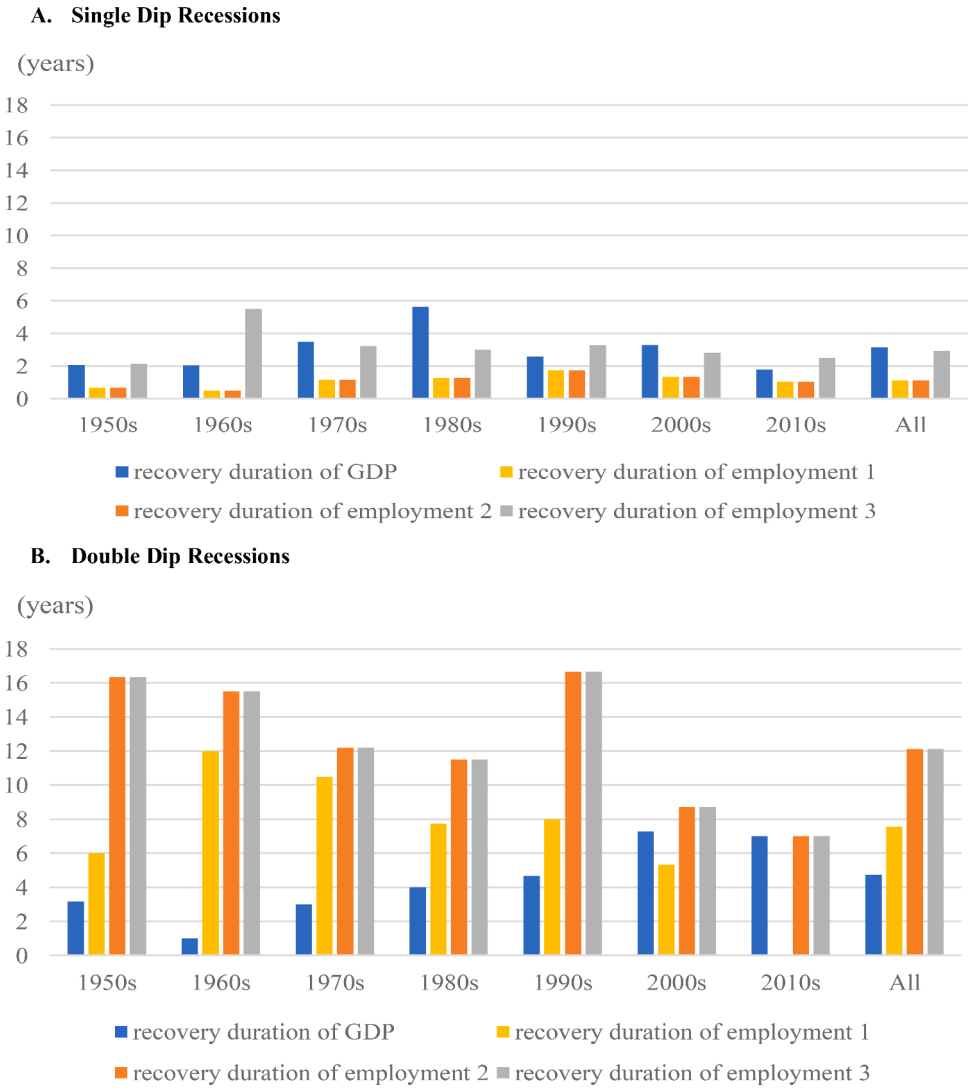

Fig. 5. Comparison of Recoveries from Single Dip and Double Dip Recessions in Terms of Employment
Notes: A single dip recession in terms of employment is when employment does not decrease, or it recovers before the next peak. A double dip recession is when employment does not completely recover to pre-crisis peak until the next peak. As in Fig. 1, we report the average duration of employment recovery for three versions.
Sources: Authors' calculations.

Fig. 6. Comparison of Recoveries from Financial-Crisis Recessions and Normal Recessions.
Notes: A financial-crisis recession is when the recession coincides with a financial crisis. Otherwise a recession is defined as a normal recession. The chronology of financial crises follows Reinhart and Rogoff (2009) and Leaven & Valencia (2012) and its update. As in Fig. 1, we report the average duration of employment recovery for three versions.
Sources: Authors' calculations.

Table 2
Correlation Coefficient Matrix of Explanatory Variables.

1											
0.41	1										
0.24	0.47	1									
0.16	0.24	0.21	1								
0.59	0.42	0.20	0.13	1							
-0.03	0.02	-0.14	-0.21	0.04	1						
0.14	0.07	0.13	0.25	0.06	-0.83	1					
-0.27	0.06	-0.13	0.24	-0.22	-0.13	0.11	1				
0.06	0.13	0.02	0.32	0.11	-0.17	0.21	0.39	1			
0.08	0.10	-0.04	0.18	0.07	-0.07	0.09	0.24	0.69	1		
-0.01	0.07	0.15	0.30	0.05	-0.33	0.31	0.11	0.19	0.06	1	
0.11	0.15	-0.07	0.21	0.13	-0.31	0.31	0.31	0.43	0.31	0.56	1
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

Notes: We report a correlation coefficient matrix of explanatory variables: (1) Amplitude of recession, (2) Double dip in GDP, (3) Double dip in Employment, (4) Global recession, (5) Financial crisis, (6) Supply shock, (7) Both shock, (8) Current account to GDP (3-year average before the peak), (9) Trade openness (3-year average before the peak), (10) Financial openness (3-year average before the peak), (11) Private debt to GDP (3-year average before the peak) and (12) Stock market capitalization to GDP (3-year average before the peak).
Sources: Authors.

Tables 3-4 show a first set of basic regression results for the entire sample. The dependent variable is the duration of the GDP recovery, defined as number of years for GDP per capita from previous peak to recovery of that prior peak. We estimate coefficients based on a parametric survival model with a Weibull distribution.[10] We consider first individual variables and then collections thereof. Note that a negative sign on a coefficient means that it lengthens the time to recovery (it reduces the likelihood of the ongoing recovery spell ending in the current period). We estimated panel survival regressions, since we sometimes have more than one recession for a given country, including country random effects.[11]

Starting with Table 3, for GDP per capita, the amplitude of the recession and the presence of a double-dip both increase recovery duration, as expected. When entered individually, both global recessions and the presence of a financial crisis similarly lengthen durations. There is also some indication (columns 6 and 7) that experiencing both supply and demand shocks (the COVID-19 case) lengthens recovery time. Column 8 suggests that the recession amplitude, double dip, financial crisis and "both shock" variables remain significant when included simultaneously.[12] All of these coefficients other than that on "both shocks" are robust to the inclusion of decade fixed effects (column 9), where the lost decade of the 1980s (and, depending on specification, the 2000s post-Global Financial Crisis recoveries) stands out as especially lengthy.

Not all of these variables are robust, however, to the addition of a vector of economic and financial country characteristics (the current account balance, trade openness, financial openness, private-sector indebtedness, and stock market capitalization). The amplitude of the recession, the presence of a double dip, and the coexistence of both supply and demand shocks continue to matter as before but not the other variables in Table 3. In addition, there now is evidence that trade openness is associated with faster recoveries. This is consistent with the idea that recovery is aided by the ability to substitute exports for domestic demand. Interestingly, this is the opposite of a finding in Cerra, Panizza and Saxena (2009).

The results for the duration of employment recoveries (Tables 5–8) are broadly similar, with some notable differences. Unlike the results for per capita GDP, financial crises are not significantly associated with the length of employment recoveries. For employment, the economic-conditions variable that matters is private debt relative to GDP prior to the previous peak, not trade openness. Intuitively, a credit/debt boom in the preceding period implies additional deleveraging following the peak and a slower, more extended recovery. These results are less well determined owing to much smaller sample size. (Recall how Fig. 7 above showed that we are lacking early-year employment data for emerging markets.)

Readers will have noted that we lose a significant number of observations when we add the vector of economic and financial country characteristics. This is due mainly to missing information on stock market capitalization (some countries, especially emerging markets toward the start of the period lacking stock markets) and on the current account. When we exclude these variables, the number of observations rises significantly, and some of the variables in earlier tables, such as the financial crisis dummy, regain their statistical significance.

5. Emerging markets and exchange rate regimes

Fig. 7 shows recovery durations separately for our sample of emerging markets. The early 1980s recessions, from which recovery was excruciatingly long, stand out clearly. By comparison, recovery has been swift in emerging markets in the two most recent decades, both by these economies' own historical standards and in comparison with the advanced countries.

[10] Coefficients rather than exponentiated coefficients are displayed.
[11] It is difficult to include the alternative of fixed effects because of the censored nature of the data.
[12] The double dip in the employment variable also is significant but with a counterintuitive positive sign.

Table 3
Determinants of the Duration of GDP Recoveries in a Simple Model: Panel Survival Analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables									
Amplitude of recession	-0.3***						-0.3***		-0.3***
	[0.0]						[0.0]		[0.0]
Double dip in GDP		-2.6***					-3.2***		-3.3***
		[0.4]					[0.4]		[0.4]
Double dip in Employment			-0.9***				0.3		0.3
			[0.3]				[0.2]		[0.2]
Global recession				-0.8***			-0.3		-0.2
				[0.2]			[0.2]		[0.2]
Financial crisis					-1.8***		-0.8***		-1.0***
					[0.3]		[0.2]		[0.3]
Supply shock						-0.6*	-0.1		0.1
						[0.4]	[0.2]		[0.2]
Both shock						-0.7***	-0.8***		-0.6***
						[0.2]	[0.2]		[0.2]
1960s								0.0	0.5
								[0.3]	[0.3]
1970s								-0.5*	-0.4*
								[0.3]	[0.2]
1980s								-1.2***	-0.5
								[0.4]	[0.3]
1990s								-0.3	0.2
								[0.2]	[0.3]
2000s								-1.2***	0.0
								[0.3]	[0.4]
2010s								-0.5	-1.0**
								[0.3]	[0.5]
Constant	-2.2***	-2.6***	-2.4***	-2.3***	-2.5***	-2.0***	-2.6***	-2.0***	-2.7***
	[0.2]	[0.2]	[0.1]	[0.1]	[0.1]	[0.1]	[0.2]	[0.2]	[0.2]
P (Weibull distribution parameter)	2.260	2.066	1.621	1.651	1.962	0.133	1.393	0.314	1.291
Observations	267	267	267	267	267	267	267	267	267
Number of countries	39	39	39	39	39	39	39	39	39
Log likelihood	-511.4	-514.6	-595.5	-593.2	-547.8	-594.0	-393.2	-581.8	-380.0

Notes: The dependent variable is the duration of GDP recoveries defined as number of years for GDP per capita from peak to recovery of prior peak. We estimate coefficients based on a random-effects parametric survival model with a Weibull distribution. Coefficients rather than exponentiated coefficients are displayed. Amplitude of recession refers to the change in GDP per capita from a peak to the next trough. We denote it as a positive value. Other variables are dummy variables that take one if the recovery is characterized by them. For example, double dip in GDP is a dummy variable that takes one if the recovery is marked by a double dip in GDP and zero otherwise. A double dip recession in GDP is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. A double dip recession in employment is when employment does not completely recover to pre-crisis peak until the next peak. A global recession refers to the case where at least ten OECD countries experience recessions simultaneously. A financial-crisis recession is when the recession coincides with a financial crisis, of which the chronology follows Reinhart and Rogoff (2009) and Laeven and Valencia (2018) and its update. For supply and both shocks, we identify aggregate supply and demand shocks following Bayoumi and Eichengreen (1993) that is based on a structural vector-autoregressive approach developed by Blanchard and Quah (1989). The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

Starting in Table 9, we add a dummy variable for emerging markets, and also interact that dummy with our measure for global recessions. The indicator for emerging markets enters uniformly with a coefficient that is small and insignificantly different from zero. However, the interaction with the global recession indicator is positive, large and significant. It essentially neutralizes the impact of global recessions when estimated on its own.

Statistically, this result reflects the fact that recovery from the Global Financial Crisis was exceptionally slow in the advanced economies, whereas the concurrent recovery was fast in emerging markets. An interpretation is that historically emerging markets have been less connected to the advanced economies whose collective downturns constitute global recessions according to our measure than such advanced economies are connected to one another. This was clearly the case in the Global Financial Crisis, when the advanced countries exported real and financial problems to one another through a set of interlocking bank and financial connections (OECD 2012, Bayoumi 2017), but emerging and developing countries, not having participated in the subprime securitization market to

Table 4
Determinants of the Duration of GDP Recoveries in an Extended Model: Panel Survival Analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables								
Amplitude of recession							-0.4***	-0.5***
							[0.1]	[0.1]
Double dip in GDP							-3.6***	-4.0***
							[0.5]	[0.7]
Double dip in Employment							0.8*	0.5
							[0.5]	[0.6]
Global recession							-0.2	0.1
							[0.4]	[0.6]
Financial crisis							0.0	-0.3
							[0.4]	[0.5]
Supply shock							0.5	0.1
							[0.4]	[0.5]
Both shock							-0.3	-0.8**
							[0.5]	[0.4]
Current account to GDP (3-year average before the peak)	2.4					3.9	1.0	-0.0
	[2.0]					[4.0]	[3.4]	[3.8]
Trade openness (3-year average before the peak)		-0.2				0.1	0.8	1.5***
		[0.2]				[0.4]	[0.5]	[0.5]
Financial openness (3-year average before the peak)			-0.01***			-0.01**	-0.01*	-0.0
			[0.0]			[0.0]	[0.0]	[0.0]
Private debt to GDP (3-year average before the peak)				-0.3		-0.5	-0.6	-0.2
				[0.2]		[0.5]	[0.5]	[0.7]
Stock market capitalization to GDP (3-year average before the peak)					-0.5	-0.0	0.6*	0.7
					[0.3]	[0.3]	[0.4]	[0.8]
1970s						-0.1		1.7
						[0.6]		[1.1]
1980s						-1.0		1.7*
						[0.9]		[1.0]
1990s						-0.5		2.7***
						[0.6]		[0.8]
2000s						-0.9**		1.5***
						[0.4]		[0.6]
Constant	-2.5***	-2.3***	-2.5***	-2.4***	-2.4***	-2.1***	-4.0***	-6.3***
	[0.2]	[0.2]	[0.1]	[0.2]	[0.2]	[0.6]	[0.7]	[1.4]
P (Weibull distribution parameter)	1.493	1.544	1.566	1.571	1.718	0.990	2.202	1.618
Observations	153	201	179	201	130	110	110	110
Number of countries	38	39	39	39	37	36	36	36
Log likelihood	-362.3	-468.1	-426.4	-468.9	-286.4	-245.3	-170.1	-159.1

Notes: The dependent variable is the duration of GDP recoveries defined as number of years for GDP per capita from peak to recovery of prior peak. We estimate coefficients based on a random-effects parametric survival model with a Weibull distribution. Coefficients rather than exponentiated coefficients are displayed. We add other economic fundamental variables such as current account balance (% of GDP), trade openness (the sum of exports and imports as % of GDP), financial openness (the sum of total assets and total liabilities as % of GDP), private credit (as % of GDP) and stock market capitalization (as % of GDP) as regressors. Amplitude of recession refers to the change in GDP per capita from a peak to the next trough. We denote it as a positive value. Other variables are dummy variables that take one if the recovery is characterized by them. For example, double dip in GDP is a dummy variable that takes one if the recovery is marked by a double dip in GDP and zero otherwise. A double dip recession in GDP is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. A double dip recession in employment is when employment does not completely recover to pre-crisis peak until the next peak. A global recession refers to the case where at least ten OECD countries experience recessions simultaneously. A financial-crisis recession is when the recession coincides with a financial crisis, of which the chronology follows Reinhart and Rogoff (2009) and Laeven and Valencia (2018) and its update. For supply and both shocks, we identify aggregate supply and demand shocks following Bayoumi and Eichengreen (1993) that is based on a structural vector-autoregressive approach developed by Blanchard and Quah (1989). The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

Table 5
Determinants of the Duration of Employment Recoveries in a Simple Model: Panel Survival Analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables									
Amplitude of recession	-0.1***						-0.0**		-0.0**
	[0.0]						[0.0]		[0.0]
Double dip in GDP		-0.1					0.9***		0.8***
		[0.2]					[0.3]		[0.3]
Double dip in Employment			-2.4***				-2.6***		-2.6***
			[0.2]				[0.2]		[0.2]
Global recession				-0.4**			-0.0		-0.1
				[0.2]			[0.2]		[0.3]
Financial crisis					-0.6***		-0.4*		-0.4*
					[0.2]		[0.2]		[0.2]
Supply shock						-0.1	-0.1		0.4
						[0.3]	[0.2]		[0.3]
Both shock						-0.5**	-0.6***		-0.1
						[0.2]	[0.2]		[0.2]
1960s								0.3	0.4
								[0.4]	[0.3]
1970s								0.1	-0.0
								[0.4]	[0.4]
1980s								-0.3	-0.6
								[0.4]	[0.4]
1990s								-0.4	-0.8**
								[0.4]	[0.3]
2000s								-0.4	-0.5
								[0.3]	[0.4]
2010s								0.2	-0.1
								[0.6]	[0.5]
Constant	-0.9***	-1.1***	-0.9***	-1.0***	-1.0***	-0.9***	-0.5**	-1.0***	-0.5**
	[0.2]	[0.1]	[0.2]	[0.2]	[0.2]	[0.2]	[0.2]	[0.3]	[0.3]
P (Weibull distribution parameter)	1.082	1.041	1.251	1.040	1.069	0.426	0.0777	0.713	0.0736
Observations	267	267	267	267	267	267	267	267	267
Number of countries	39	39	39	39	39	39	39	39	39
Log likelihood	-503.6	-512.0	-456.8	-509.0	-506.6	-507.5	-437.3	-505.2	-431.0

Notes: The dependent variable is the duration of employment recoveries defined as number of years for employment from peak to recovery of prior peak. If employment never declines in recession, the duration is regarded as zero. We estimate coefficients based on a random-effects parametric survival model with a Weibull distribution. Coefficients rather than exponentiated coefficients are displayed. Amplitude of recession refers to the change in GDP per capita from a peak to the next trough. We denote it as a positive value. Other variables are dummy variables that take one if the recovery is characterized by them. For example, double dip in GDP is a dummy variable that takes one if the recovery is marked by a double dip in GDP and zero otherwise. A double dip recession in GDP is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. A double dip recession in employment is when employment does not completely recover to pre-crisis peak until the next peak. A global recession refers to the case where at least ten OECD countries experience recessions simultaneously. A financial-crisis recession is when the recession coincides with a financial crisis, of which the chronology follows Reinhart and Rogoff (2009) and Laeven and Valencia (2018) and its update. For supply and both shocks, we identify aggregate supply and demand shocks following Bayoumi and Eichengreen (1993) that is based on a structural vector-autoregressive approach developed by Blanchard and Quah (1989). The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

Table 6
Determinants of the Duration of Employment Recoveries in an Extended Model: Panel Survival Analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES								
Amplitude of recession							-0.0	-0.0
							[0.1]	[0.1]
Double dip in GDP							0.7	0.7
							[0.4]	[0.5]
Double dip in Employment							-2.2***	-2.2***
							[0.5]	[0.6]
Global recession							-0.2	-0.3
							[0.3]	[0.3]
Financial crisis							-0.6	-0.6
							[0.5]	[0.5]
Supply shock							0.8	0.6
							[0.8]	[0.8]
Both shock							-0.3	-0.6
							[0.7]	[0.7]
Current account to GDP (3-year average before the peak)	7.7***					9.4***	3.7	3.4
	[2.3]					[3.2]	[3.0]	[3.2]
Trade openness (3-year average before the peak)		0.0				-0.2	0.7	0.6
		[0.5]				[0.6]	[0.4]	[0.5]
Financial openness (3-year average before the peak)			0.01***			0.0	0.0	0.0
			[0.0]			[0.0]	[0.0]	[0.0]
Private debt to GDP (3-year average before the peak)				-0.8***		-1.4**	-0.9**	-1.2**
				[0.3]		[0.6]	[0.4]	[0.5]
Stock market capitalization to GDP (3-year average before the peak)					0.2	0.7**	0.6*	0.6
					[0.2]	[0.4]	[0.3]	[0.4]
1970s						-1.6*		-1.6*
						[0.9]		[0.9]
1980s						-0.9		-0.4
						[0.7]		[0.5]
1990s						-1.1*		-0.5
						[0.6]		[0.5]
2000s						-1.4***		-0.1
						[0.4]		[0.6]
Constant	-1.2***	-1.3***	-1.4***	-0.8***	-1.7***	0.2	-1.4*	-0.5
	[0.2]	[0.3]	[0.2]	[0.3]	[0.2]	[0.9]	[0.8]	[1.1]
P (Weibull distribution parameter)	1.244	1.153	1.140	1.117	1.113	1.003	0.112	0.109
Observations	153	201	179	201	130	110	110	110
Number of countries	38	39	39	39	37	36	36	36
Log likelihood	-283.6	-382.1	-362.2	-387.3	-275	-214.5	-197.1	-194.8

Notes: The dependent variable is the duration of employment recoveries defined as number of years for employment from peak to recovery of prior peak. If employment never declines in recession, the duration is regarded as zero. We estimate coefficients based on a random-effects parametric survival model with a Weibull distribution. Coefficients rather than exponentiated coefficients are displayed. We add other economic fundamental variables such as current account balance (% of GDP), trade openness (the sum of exports and imports as % of GDP), financial openness (the sum of total assets and total liabilities as % of GDP), private credit (as % of GDP) and stock market capitalization (as % of GDP) as regressors. Amplitude of recession refers to the change in GDP per capita from a peak to the next trough. We denote it as a positive value. Other variables are dummy variables that take one if the recovery is characterized by them. For example, double dip in GDP is a dummy variable that takes one if the recovery is marked by a double dip in GDP and zero otherwise. A double dip recession in GDP is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. A double dip recession in employment is when employment does not completely recover to pre-crisis peak until the next peak. A global recession refers to the case where at least ten OECD countries experience recessions simultaneously. A financial-crisis recession is when the recession coincides with a financial crisis, of which the chronology follows Reinhart and Rogoff (2009) and Laeven and Valencia (2018) and its update. For supply and both shocks, we identify aggregate supply and demand shocks following Bayoumi and Eichengreen (1993) that is based on a structural vector-autoregressive approach developed by Blanchard and Quah (1989). The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

Table 7
Determinants of the Duration of Employment Recoveries in a Simple Model: Panel Survival Analysis with Zero durations Excluded

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES									
Amplitude of recession	-0.1**						-0.1		-0.1
	[0.0]						[0.0]		[0.0]
Double dip in GDP		-0.4					1.3***		1.3***
		[0.3]					[0.4]		[0.4]
Double dip in Employment			-2.7***				-3.2***		-3.3***
			[0.3]				[0.4]		[0.4]
Global recession				-0.4			0.1		0.0
				[0.2]			[0.3]		[0.3]
Financial crisis					-0.7**		-0.5		-0.5
					[0.3]		[0.4]		[0.4]
Supply shock						-0.0	0.1		0.6
						[0.6]	[0.5]		[0.6]
Both shock						-0.2	-0.4		-0.1
						[0.3]	[0.4]		[0.6]
1960s								0.0	0.0
								[0.9]	[0.5]
1970s								-0.1	-0.2
								[0.8]	[0.7]
1980s								-0.1	-0.4
								[0.7]	[1.0]
1990s								0.1	-0.5
								[0.7]	[0.9]
2000s								-0.1	-0.1
								[0.6]	[0.8]
2010s								0.5	-0.1
								[0.8]	[0.9]
Constant	-2.7***	-2.9***	-3.2***	-2.8***	-2.8***	-2.8***	-3.2***	-3.0***	-3.2***
	[0.2]	[0.2]	[0.3]	[0.2]	[0.2]	[0.2]	[0.4]	[0.4]	[0.4]
P (Weibull distribution parameter)	1.567	1.537	2.157	1.547	1.597	0.0585	0.0404	0.904	0.0378
Observations	126	126	126	126	126	126	126	126	126
Number of countries	35	35	35	35	35	35	35	35	35
Log likelihood	-313.2	-315.9	-273.7	-315.4	-313.4	-316.4	-264.0	-316.0	-263.1

Notes: The dependent variable is the duration of employment recoveries defined as number of years for employment from peak to recovery of prior peak. If employment never declines in recession, the corresponding recovery is excluded. We estimate coefficients based on a random-effects parametric survival model with a Weibull distribution. Coefficients rather than exponentiated coefficients are displayed. Amplitude of recession refers to the change in GDP per capita from a peak to the next trough. We denote it as a positive value. Other variables are dummy variables that take one if the recovery is characterized by them. For example, double dip in GDP is a dummy variable that takes one if the recovery is marked by a double dip in GDP and zero otherwise. A double dip recession in GDP is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. A double dip recession in employment is when employment does not completely recover to pre-crisis peak until the next peak. A global recession refers to the case where at least ten OECD countries experience recessions simultaneously. A financial-crisis recession is when the recession coincides with a financial crisis, of which the chronology follows Reinhart and Rogoff (2009) and Laeven and Valencia (2018) and its update. For supply and both shocks, we identify aggregate supply and demand shocks following Bayoumi and Eichengreen (1993) that is based on a structural vector-autoregressive approach developed by Blanchard and Quah (1989). The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

Table 8
Determinants of the Duration of Employment Recoveries in an Extended Model: Panel Survival Analysis with Zero durations Excluded

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES								
Amplitude of recession							-0.2	-0.1
							[0.1]	[0.1]
Double dip in GDP							1.3*	1.3
							[0.8]	[0.9]
Double dip in Employment							-3.8***	-3.9***
							[1.1]	[1.3]
Global recession							-0.3	-0.5
							[0.7]	[0.7]
Financial crisis							0.2	0.2
							[0.7]	[0.7]
Supply shock							1.8	1.6
							[1.4]	[1.4]
Both shock							0.5	0.2
							[1.2]	[1.1]
Current account to GDP (3-year average before the peak)	9.6**					16.1***	11.1*	10.7
	[4.5]					[5.3]	[6.0]	[6.9]
Trade openness (3-year average before the peak)		0.1				-0.7	0.6	0.6
		[0.4]				[1.1]	[1.3]	[1.4]
Financial openness (3-year average before the peak)			-0.0			0.1	0.1	0.0
			[0.0]			[0.1]	[0.1]	[0.1]
Private debt to GDP (3-year average before the peak)				-0.4		-1.5***	-1.0*	-1.6**
				[0.3]		[0.6]	[0.5]	[0.7]
Stock market capitalization to GDP (3-year average before the peak)					0.3	1.3***	0.9*	0.9
					[0.3]	[0.4]	[0.5]	[0.6]
1970s						-2.1**		-2.1
						[1.0]		[1.4]
1980s						-1.3		-1.1
						[1.1]		[1.1]
1990s						-0.8		-0.6
						[0.7]		[0.7]
2000s						-1.9***		-0.4
						[0.5]		[0.8]
Constant	-3.5***	-3.1***	-3.0***	-2.8***	-3.4***	-2.3	-5.7***	-4.4**
	[0.3]	[0.3]	[0.3]	[0.3]	[0.3]	[1.4]	[1.6]	[1.9]
P (Weibull distribution parameter)	2.104	1.634	1.593	1.614	1.772	1.058	0.0228	0.0209
Observations	79	100	98	103	80	68	68	68
Number of countries	30	33	32	33	33	30	30	30
Log likelihood	-175.1	-241.3	-241.8	-251.1	-186.7	-143.5	-123.3	-121.7

Notes: The dependent variable is the duration of employment recoveries defined as number of years for employment from peak to recovery of prior peak. If employment never declines in recession, the corresponding recovery is excluded. We estimate coefficients based on a random-effects parametric survival model with a Weibull distribution. Coefficients rather than exponentiated coefficients are displayed. We add other economic fundamental variables such as current account balance (% of GDP), trade openness (the sum of exports and imports as % of GDP), financial openness (the sum of total assets and total liabilities as % of GDP), private credit (as % of GDP) and stock market capitalization (as % of GDP) as regressors. Amplitude of recession refers to the change in GDP per capita from a peak to the next trough. We denote it as a positive value. Other variables are dummy variables that take one if the recovery is characterized by them. For example, double dip in GDP is a dummy variable that takes one if the recovery is marked by a double dip in GDP and zero otherwise. A double dip recession in GDP is when real GDP per capita does not completely recover to pre-crisis peak until the next peak. A double dip recession in employment is when employment does not completely recover to pre-crisis peak until the next peak. A global recession refers to the case where at least ten OECD countries experience recessions simultaneously. A financial-crisis recession is when the recession coincides with a financial crisis, of which the chronology follows Reinhart and Rogoff (2009) and Laeven and Valencia (2018) and its update. For supply and both shocks, we identify aggregate supply and demand shocks following Bayoumi and Eichengreen (1993) that is based on a structural vector-autoregressive approach developed by Blanchard and Quah (1989). The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

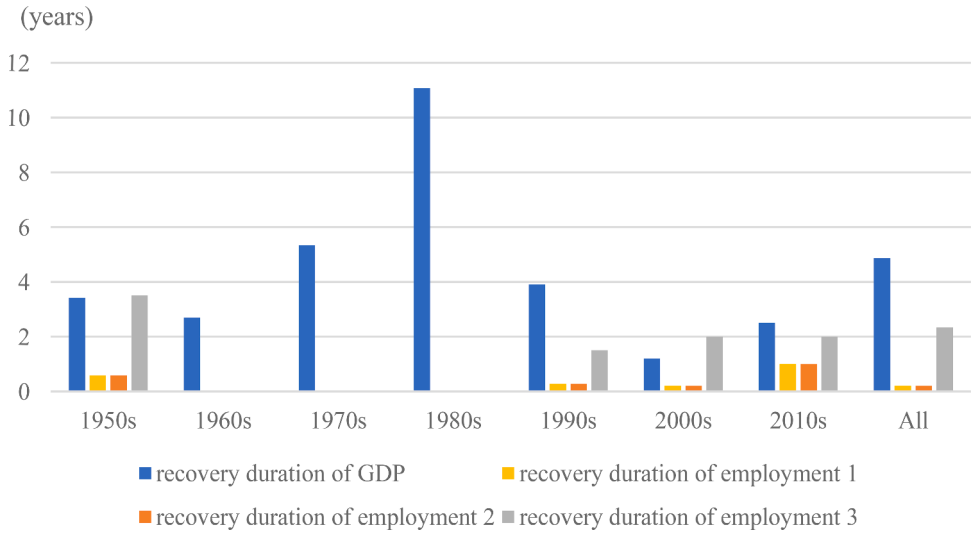

Fig. 7. Length of Years to Recover to Pre-Crisis Peak Level of Real GDP and Employment in Emerging Markets
Notes: The sample covers 21 major emerging markets listed in Table 1. Recovery duration refers to the length of years to recover to pre-crisis peak. We report the average duration of recovery of both real GDP per capita and employment by decades, with the average duration for all years at the right end. While real GDP per capita recovers at least before it reaches the next two peaks, employment sometimes takes more than two peaks to completely recover. Furthermore, sometimes employment never declines during the recession in which case we set the duration equal to zero. Henceforth we report three versions of average duration of employment to recover. The first version (yellow) reports the average duration of employment recovery when we remove the case where it takes more than two peaks to recover. The second version (orange) reports the average duration when we include the case where it takes more than two peaks to recover. Finally, the third version (grey) reports the average duration when we further remove the case where employment never declines (i.e. zero duration).
Sources: Authors' calculations

the same extent, were much less affected. Whether this is still true today is, of course, an open question.

Previous studies have found conflicting results for recovery times under alternative exchange rate regimes. In Fig. 8 we show recovery times under pegged and floating rates. We include also a managed float category; this corresponds to coarse classification code 3 of Ilzetzki, Reinhart and Rogoff (2019). It includes moving bands that are narrower than or equal to +/-2% and pre-announced crawling bands that are wider than or equal to +/-2 per cent. Fig. 8 shows that the duration of per capital GDP recoveries is shorter under free floats than alternative exchange rate regimes.

In Tables 10 (for GDP recoveries) and 11 (for employment recoveries) we added a dummy variable for floating rate regimes and interacted this with the global recession measure. (With guidance from Fig. 8, we aggregated managed floats and pegs into one category.) We find strong evidence that countries with floating rates recovery more quickly in general, but that this additional effect is weaker in global recessions.

Our finding of faster recovery under flexible rates is consistent with that in Cerra, Panizza and Saxena (2009), who unlike us did not have data for the most recent decade of recoveries. It is consistent with the logic that one way in which policy makers can facilitate recovery is with policies that substitute external demand for domestic demand that is slow to recover and that a floating rate is useful for expenditure switching. That expenditure switching has relatively little benefit when the recession is global (when there is little expenditure to switch toward) similarly makes sense.

6. Implications for the COVID-19 Recession

What are the implications of these findings for recovery from the COVID-19 recession? A number of our statistical results point in the direction of gradual, lengthy recoveries. COVID-19 recessions have been unusually severe, which will make for extended recoveries if history is any guide. That the COVID recession is global points in the same direction. It means that countries, including emerging markets that have been moving in the direction of more freely floating exchange rates will not be able to exploit that policy flexibility by depreciating their currencies and crowding in exports, since their export markets are likely to likewise be slow to recover. It means that the tendency for economies that are more open to trade to recover more quickly, something that normally works in Asia's favor, will be less favorable this time.

We find that, historically, emerging markets have been affected less than advanced countries by global recessions emanating from the advanced country world. We saw this in the Global Financial Crisis of 2008-9. Banking and financial systems in the developing world were not directly implicated in the excesses of the Subprime Crisis that dragged down so many advanced economies. And with help from a rapid, robust recovery in China, fueled by the application of exceptional levels of monetary and fiscal policy support, they were able to skate through that crisis relatively unscathed. Whether this will again be the case is to be seen. Emerging economy

Table 9
Emerging Markets and Global Recessions: Duration of GDP Recoveries.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables								
Amplitude of recession	-0.2***	-0.2***	-0.3***	-0.4***	-0.3***	-0.3***	-0.4***	-0.5***
	[0.0]	[0.0]	[0.1]	[0.1]	[0.0]	[0.0]	[0.1]	[0.1]
Double dip in GDP	-3.2***	-3.2***	-3.8***	-3.8***	-3.1***	-3.2***	-3.6***	-3.8***
	[0.4]	[0.3]	[0.6]	[0.6]	[0.4]	[0.4]	[0.7]	[0.6]
Double dip in Employment	0.5**	0.4**	1.1***	0.6	0.3	0.2	0.9*	0.5
	[0.2]	[0.2]	[0.3]	[0.5]	[0.2]	[0.2]	[0.5]	[0.6]
Global recession	-0.3	-0.4*	-0.8***	-0.8**	-0.5**	-0.5	-1.0**	-0.9
	[0.2]	[0.2]	[0.3]	[0.4]	[0.2]	[0.3]	[0.5]	[0.7]
Financial crisis	-0.6**	-0.8***	0.3	-0.0	-0.8***	-1.0***	0.2	-0.1
	[0.3]	[0.2]	[0.4]	[0.4]	[0.3]	[0.3]	[0.4]	[0.4]
Supply shock	-0.2	-0.0	0.0	0.1	-0.2	0.1	0.3	0.2
	[0.2]	[0.2]	[0.3]	[0.4]	[0.2]	[0.2]	[0.4]	[0.5]
Both shock	-0.8***	-0.8***	-0.6***	-0.9***	-0.8***	-0.6**	-0.4	-0.7
	[0.2]	[0.2]	[0.2]	[0.3]	[0.2]	[0.3]	[0.3]	[0.4]
Current account to GDP (3-year average before the peak)			1.5	-0.4			1.1	-0.1
			[2.6]	[2.9]			[2.9]	[3.4]
Trade openness (3-year average before the peak)			0.5	1.1***			0.5	1.2**
			[0.3]	[0.4]			[0.4]	[0.5]
Financial openness (3-year average before the peak)			0.0	-0.0			-0.0	-0.0
			[0.0]	[0.0]			[0.0]	[0.0]
Private debt to GDP (3-year average before the peak)			0.6*	0.5			0.3	0.4
			[0.3]	[0.4]			[0.4]	[0.6]
Stock market capitalization to GDP (3-year average before the peak)			-0.3	-0.4			0.1	0.3
			[0.3]	[0.4]			[0.4]	[0.8]
Emerging markets dummy	-0.1	-0.2	0.0	-0.3	-0.0	-0.1	0.1	-0.2
	[0.2]	[0.2]	[0.3]	[0.4]	[0.2]	[0.3]	[0.5]	[0.8]
Emerging markets*Global recession	0.5	0.4	1.9***	1.9***	0.9**	0.8	1.9***	2.3***
	[0.4]	[0.4]	[0.4]	[0.5]	[0.4]	[0.5]	[0.5]	[0.8]
Constant	-2.3***	-2.4***	-3.5***	-4.6***	-2.7***	-2.7***	-4.2***	-6.1***
	[0.2]	[0.2]	[0.4]	[0.7]	[0.2]	[0.2]	[0.6]	[1.3]
Panel Regressions	No	No	No	No	Yes	Yes	Yes	Yes
Decade Dummies	No	Yes	No	Yes	No	Yes	No	Yes
P (Weibull distribution parameter)	3.217	3.382	3.526	3.942	1.369	1.255	2.400	1.732
Observations	267	267	110	110	267	267	110	110
Number of countries					39	39	36	36
Log likelihood	-98.21	-85.18	-35.99	-24.21	-389.8	-377.8	-163.6	-152.4

Notes: The dependent variable is the duration of GDP recoveries defined as number of years for GDP per capita from peak to recovery of prior peak. We estimate coefficients based on a parametric survival model with a Weibull distribution. We include an emerging-markets dummy that takes one if the country belongs to emerging markets and zero otherwise and its interaction with the global recession dummy as additional explanatory variables. Columns (1)-(4) and (5)-(8) report a parametric survival model with a Weibull distribution without and with panel structures, respectively. The odd columns do not include decade dummies. The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

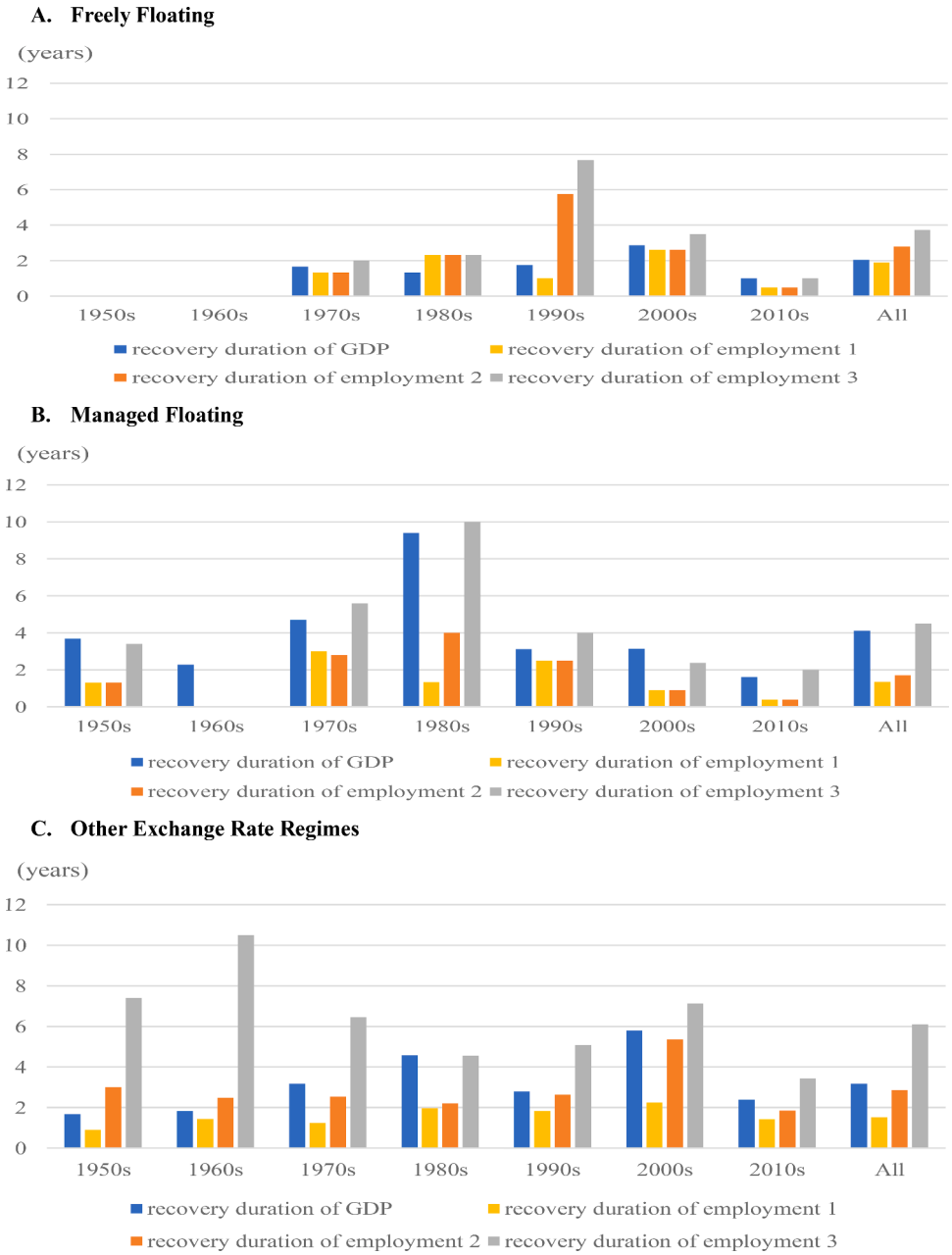

Fig. 8. Comparison of Recoveries of Countries with Different Exchange Rate Regimes
Notes: The exchange rate regimes are collected from Ilzetzki, Reinhart and Rogoff (2019). Managed floating refers to the coarse classification code 3 that includes moving band that is narrower than or equal to +/-2% and pre announced crawling band that is wider than or equal to +/-2%.
Sources: Authors' calculations.

Table 10
Exchange Rate Regimes and Global Recessions: Duration of GDP Recoveries.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables								
Amplitude of recession	-0.2***	-0.3***	-0.3***	-0.4***	-0.3***	-0.3***	-0.4***	-0.5***
	[0.0]	[0.0]	[0.1]	[0.1]	[0.0]	[0.0]	[0.1]	[0.1]
Double dip in GDP	-3.2***	-3.2***	-3.6***	-3.9***	-3.2***	-3.3***	-3.6***	-4.1***
	[0.4]	[0.3]	[0.6]	[0.6]	[0.4]	[0.4]	[0.5]	[0.5]
Double dip in Employment	0.5***	0.4**	1.0***	0.5	0.3	0.2	0.5	0.1
	[0.2]	[0.2]	[0.3]	[0.4]	[0.2]	[0.2]	[0.6]	[0.8]
Global recession	-0.2	-0.1	-0.1	0.0	-0.3	-0.1	-0.1	0.3
	[0.2]	[0.2]	[0.2]	[0.3]	[0.2]	[0.3]	[0.4]	[0.5]
Financial crisis	-0.7***	-0.8***	0.1	-0.3	-0.8***	-1.0***	0.1	-0.2
	[0.2]	[0.2]	[0.3]	[0.3]	[0.2]	[0.3]	[0.3]	[0.5]
Supply shock	-0.2	0.0	0.1	-0.1	-0.1	0.1	0.5	0.0
	[0.2]	[0.2]	[0.3]	[0.3]	[0.2]	[0.2]	[0.5]	[0.4]
Both shock	-0.9***	-0.8***	-0.8***	-1.4***	-0.8***	-0.6***	-0.3	-1.0**
	[0.1]	[0.2]	[0.3]	[0.3]	[0.2]	[0.2]	[0.5]	[0.4]
Current account to GDP (3-year average before the peak)			-1.0	-2.4			-0.4	-2.7
			[2.7]	[2.8]			[3.4]	[3.5]
Trade openness (3-year average before the peak)			1.0**	1.9***			1.2**	2.0***
			[0.5]	[0.4]			[0.6]	[0.6]
Financial openness (3-year average before the peak)			-0.0*	-0.0***			-0.0**	-0.0**
			[0.0]	[0.0]			[0.0]	[0.0]
Private debt to GDP (3-year average before the peak)			-0.4	-0.2			-0.9**	-0.6
			[0.4]	[0.4]			[0.4]	[0.6]
Stock market capitalization to GDP (3-year average before the peak)			0.4	-0.0			0.7*	0.7
			[0.3]	[0.4]			[0.4]	[0.7]
Floating dummy	0.6**	0.8***	1.5***	2.2***	0.6***	0.8***	2.0***	2.6***
	[0.3]	[0.2]	[0.5]	[0.4]	[0.2]	[0.2]	[0.8]	[0.8]
Floating dummy*Global recession	-0.4	-0.8**	-1.0	-2.0***	-0.3	-0.8*	-1.4	-2.4***
	[0.5]	[0.4]	[0.7]	[0.6]	[0.5]	[0.4]	[1.0]	[0.9]
Constant	-2.4***	-2.5***	-3.3***	-5.3***	-2.6***	-2.7***	-4.5***	-6.9***
	[0.1]	[0.2]	[0.5]	[0.8]	[0.2]	[0.2]	[0.9]	[1.5]
Panel Regressions	No	No	No	No	Yes	Yes	Yes	Yes
Decade Dummies	No	Yes	No	Yes	No	Yes	No	Yes
P (Weibull distribution parameter)	3.235	3.401	3.307	3.971	1.360	1.213	1.638	1.152
Observations	267	267	110	110	267	267	110	110
Number of countries					39	39	36	36
Log likelihood	-98.07	-84.38	-40.26	-23.53	-392.1	-378.3	-166.2	-152.9

Notes: The dependent variable is the duration of GDP recoveries defined as number of years for GDP per capita from peak to recovery of prior peak. We estimate coefficients based on a parametric survival model with a Weibull distribution. We include a dummy for floating exchange rate regimes that takes one if the country adopts a floating exchange rate regime and zero otherwise and its interaction with the global recession dummy as additional explanatory variables. The exchange rate regimes are collected from Ilzetzki, Reinhart and Rogoff (2019). We regard "freely floating" as a floating exchange rate regime. Columns (1)-(4) and (5)-(8) report a parametric survival model with a Weibull distribution without and with panel structures, respectively. The odd columns do not include decade dummies. The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

financial systems may still be less tightly integrated into global financial markets, but levels of integration are rising, and a range of emerging markets saw significant capital outflows in the early stages of the crisis. Here it has helped that central banks, in the Asia-Pacific region and generally, dramatically increased their foreign exchange reserves since the Asian crisis and again, in many cases, since the Global Financial Crisis, putting them in a position where they could finance those outflows. It also helped that the Federal Reserve System cut interest rates rapidly and sharply, causing outflows from emerging markets to moderate.

The Global Financial Crisis, like the COVID-19 crisis, was marked by a sharp contraction of global trade, something that poses special difficulties for export-oriented economies. In addition to the decline in trade due to collapsing demand, the COVID crisis saw disruptions to global supply chains as lockdowns and shipping problems interrupted the provision of intermediates, to the disadvantage of economies disproportionately involved in global supply chains. How this global recession affects emerging economies may again turn, as in the global recession of 2008-9, on recovery in China, which is a motor for trade and growth in Emerging Asia and emerging markets generally.

The COVID-19 recession involves both aggregate-supply and aggregate-demand shocks, as first supply is disrupted by lockdowns and then households and firms reduce their spending owing to loss of incomes. Our results strongly suggest that these dual-shock

Table 11
Exchange Rate Regimes and Global Recessions: Duration of Employment Recoveries When Zero Durations Included.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES								
Amplitude of recession	-0.0	0.0	-0.0	-0.0	-0.0**	-0.0**	-0.0	-0.0
	[0.0]	[0.0]	[0.0]	[0.0]	[0.0]	[0.0]	[0.1]	[0.0]
Double dip in GDP	0.8***	0.7***	0.7*	0.7	0.8***	0.8***	0.6	0.7
	[0.2]	[0.2]	[0.4]	[0.4]	[0.3]	[0.3]	[0.4]	[0.4]
Double dip in Employment	-2.3***	-2.3***	-2.2***	-2.2***	-2.6***	-2.7***	-2.2***	-2.2***
	[0.2]	[0.2]	[0.4]	[0.5]	[0.2]	[0.2]	[0.5]	[0.5]
Global recession	-0.4**	-0.4*	0.0	-0.3	0.1	0.1	0.0	-0.3
	[0.2]	[0.2]	[0.3]	[0.4]	[0.2]	[0.3]	[0.4]	[0.4]
Financial crisis	-0.2	-0.2	-0.3	-0.4	-0.4*	-0.4*	-0.6	-0.4
	[0.2]	[0.2]	[0.3]	[0.4]	[0.2]	[0.2]	[0.5]	[0.4]
Supply shock	0.1	0.3	1.0**	0.8	-0.1	0.4	1.0	0.8
	[0.2]	[0.3]	[0.5]	[0.6]	[0.2]	[0.3]	[0.7]	[0.6]
Both shock	-0.5***	-0.3	-0.4	-0.6	-0.6***	-0.1	-0.2	-0.6
	[0.2]	[0.3]	[0.5]	[0.6]	[0.2]	[0.2]	[0.7]	[0.6]
Current account to GDP (3-year average before the peak)			1.2	1.5			2.7	1.5
			[2.1]	[2.3]			[2.8]	[2.3]
Trade openness (3-year average before the peak)			0.9**	0.9*			0.7	0.9*
			[0.4]	[0.5]			[0.6]	[0.5]
Financial openness (3-year average before the peak)			-0.0	-0.0			-0.0	-0.0
			[0.0]	[0.0]			[0.0]	[0.0]
Private debt to GDP (3-year average before the peak)			-1.3***	-1.7***			-1.1*	-1.7***
			[0.4]	[0.5]			[0.6]	[0.5]
Stock market capitalization to GDP (3-year average before the peak)			1.0***	0.9***			0.8*	0.9***
			[0.3]	[0.3]			[0.4]	[0.3]
Floating dummy	-0.1	-0.1	1.3***	1.3***	-0.3	-0.1	0.7	1.3***
	[0.2]	[0.2]	[0.4]	[0.4]	[0.4]	[0.4]	[0.9]	[0.4]
Floating dummy*Global recession	0.1	0.0	-1.4*	-1.2*	-0.4	-0.6	-1.2	-1.2*
	[0.5]	[0.5]	[0.7]	[0.7]	[0.8]	[0.8]	[1.0]	[0.7]
Constant	-0.4**	-0.5***	-1.5**	-0.7	-0.5*	-0.5*	-1.5*	-0.7
	[0.2]	[0.2]	[0.6]	[0.9]	[0.2]	[0.3]	[0.8]	[0.9]
Panel Regressions	No	No	No	No	Yes	Yes	Yes	Yes
Decade Dummies	No	Yes	No	Yes	No	Yes	No	Yes
P (Weibull distribution parameter)	1.033	1.043	1.306	1.373	0.0753	0.0705	0.109	0.112
Observations	267	267	110	110	267	267	110	110
Number of countries					39	39	36	36
Log likelihood	-385.1	-381.8	-136.5	-132.9	-435.8	-429.8	-196.2	-193.7

Notes: The dependent variable is the duration of employment recoveries defined as number of years for employment from peak to recovery of prior peak. If employment never declines in recession, the duration is regarded as zero. We estimate coefficients based on a parametric survival model with a Weibull distribution. We include a dummy for floating exchange rate regimes that takes one if the country adopts a floating exchange rate regime and zero otherwise and its interaction with the global recession dummy as additional explanatory variables. The exchange rate regimes are collected from Ilzetzki, Reinhart and Rogoff (2019). We regard "freely floating" as a floating exchange rate regime. Columns (1)-(4) and (5)-(8) report a parametric survival model with a Weibull distribution without and with panel structures, respectively. The odd columns do not include decade dummies. The numbers in brackets are robust standard errors and *, **, and *** refer to statistical significance at the 10, 5 and 1 percent level, respectively.
Sources: Authors' calculations

recessions are the ones from which recovery is slowest. While the negative supply shock is unavoidable under the circumstances, the negative demand shock can be mitigated by policy. Here emerging markets have responded more aggressively than to previous recessions. Some, with greater fiscal space than in those previous recessions, have used it more aggressively. The rapid response of multilaterals such as the IMF and ADB has provided poor countries with additional fiscal space. Nonetheless, estimates suggest that emerging markets are in a position to provide only half as much fiscal support as the advanced economies (ADB 2020, Alberola-Ila et al. 2020).

Some emerging markets, having built up monetary policy credibility over time, have been able to cut interest rates. Some have even been able to engage in asset purchase programs. This is in contrast to earlier recessions, when central banks were compelled to raise interest rates despite recessionary pressures in order to contain inflation and limit capital flight.[13]

Our analysis confirms that recoveries from recessions marked by financial crises take longer than other recoveries. So far, the COVID-19 recession has not given rise to full-fledged financial crises. This reflects the efforts of governments to put in place stronger macro-prudential and micro-prudential policies, the liquidity support that central banks with greater policy flexibility have been able to provide to financial systems, and the fiscal support that governments have provided for spending. But there is little question but that financial problems are coming. Lockdowns and recessions make it difficult for borrowers to repay. And problems for borrowers eventually become problems for their lenders. Experience suggests that quick resolution of the resulting banking and financial problems makes for quicker economic recovery.

A last finding of our analysis concerns double-dip recessions, which logically delay full recovery. Another wave of COVID-19 cases would mean renewed lockdowns and further dips in GDP. Whether there are further COVID waves and macroeconomic dips will depend partly on the epidemiology of the virus itself. But it will depend also on containment and mitigation measures – on the effectiveness of the pharmaceutical and non-pharmaceutical interventions taken in response .

Author statement

Barry Eichengreen: Conceptualization, Methodology, Writing- Original draft preparation.
Donghyun Park: Conceptualization, Writing- Original draft preparation.
Kwanho Shin: Conceptualization, Methodology, Software, Writing- Original draft preparation.

Appendix

Tables A1 and A2

Table A1
Definitions of Variables and Data Sources.

Variables	Description	Data Source
Real GDP per capita, 1950–2017	Per capita real GDP at constant 2011 national prices divided by population (in 2011 dollars)	Penn World Tables 9.1
Employment, 1950-2017	Number of Employment engaged (in millions)	Penn World Tables 9.1
CPI, 1955–2017	Consumption Price Index (2015=100)	OECD; WDI
Financial crisis, 1960–2017	Systemic Banking Crisis, Currency Crisis and Sovereign Debt Crisis (Starting Year)	Laeven and Valencia (2018); Reinhart and Rogoff (2009)
Current account balance, 1970–2017	Current account balance (percentage of GDP)	WDI
Trade openness, 1970–2017	Sum of exports and imports of goods and services measured as a share of GDP (percentage of GDP)	WDI
Financial openness, 1970–2011	Total foreign assets plus total foreign liabilities as a share of gross domestic product (percentage of GDP)	Lane and Milesi-Ferretti dataset
Private credit to GDP (%), 1960-2017	Private credit by deposit money banks and other financial institutions to GDP.	WDI
Stock capitalization to GDP (%), 1975-2017	Total value of all listed shares in a stock market as a percentage of GDP.	WDI
Exchange rate regimes	Feely floating: coarse classification code 4; managed floating: coarse classification code 3	Ilzetzki, Reinhart and Rogoff (2019)

Source: Authors' compilation.

[13] Eichengreen, Gupta and Choudary (2020) show that the credibility imparted by inflation targeting is important in this connection: inflation targeters were able to cut interest rates by an additional 50 basis points, relative to non-inflation targeters, in the first half of 2020.

Table A2
List of Recoveries.

Year	Country	Percent change Peak to trough GDP	Peak to trough E	Number of years Peak to recovery GDP	Peak to recovery E	Diff. in peaks	Double dip GDP	Double dipE	No. of recess	Shocks
1950	Denmark	-2.45	0.00	3	0	0	0	0	4	.
1950	LUX	-5.07	-0.14	3	11	0	0	1	4	.
1950	Australia	-6.67	3.28	3	0	0	0	0	6	.
1950	NZL	-6.85	5.75	4	0	0	0	0	6	.
1950	Colombia	-0.84	1.90	2	0	0	0	0	4	.
1950	Thailand	-26.68	8.44	12	0	0	1	0	6	.
1951	Austria	-0.28	-2.24	2	4	0	0	0	6	.
1951	Switz.	-0.56	1.89	2	0	0	0	0	6	.
1951	Greece	-2.66	4.38	2	0	0	0	0	6	.
1951	Ireland	-1.49	-1.34	2	43	0	0	1	6	.
1951	Israel	-8.38	8.80	3	0	0	0	0	6	.
1952	Finland	-1.56	0.88	2	0	0	0	0	3	.
1952	Spain	-4.44	0.63	2	0	0	0	0	3	.
1952	Mexico	-3.64	1.16	2	0	0	0	0	3	.
1953	US	-2.32	-1.83	2	2	0	0	0	3	.
1953	LUX	-1.41	-0.14	2	8	0	0	1	3	.
1953	Canada	-4.07	-0.78	2	2	0	0	0	3	.
1953	Turkey	-12.77	0.51	4	0	0	1	0	3	.
1953	Chile	-7.55	1.07	5	0	0	1	0	3	.
1953	China	-9.36	2.35	3	0	0	0	0	3	.
1954	Denmark	-1.19	-0.30	2	5	0	0	0	1	.
1954	Thailand	-10.83	2.74	3	0	0	0	0	1	.
1955	Ireland	-5.07	-4.94	4	24	0	0	1	4	.
1955	Turkey	-1.89	-4.61	2	5	0	0	1	3	.
1955	Australia	-2.19	2.96	3	0	0	0	0	4	.
1955	NZL	-0.55	1.80	2	0	0	0	0	3	.
1955	Chile	-1.52	1.19	2	0	0	0	0	3	.
1955	Colombia	-5.56	6.56	5	0	0	0	0	9	.
1956	Canada	-1.85	-2.99	4	5	1	0	0	9	.
1956	Finland	-1.49	0.00	3	3	2	0	0	9	.
1956	India	-1.85	1.52	2	0	0	0	0	4	.
1956	Malaysia	-5.61	3.98	3	0	0	0	0	9	.
1957	US	-2.41	-1.80	2	2	0	0	0	9	.
1957	UK	-0.11	-1.08	2	5	0	0	0	9	.
1957	Belgium	-1.24	-1.07	2	3	0	0	0	9	.
1957	NLD	-2.44	-0.93	2	2	0	0	0	9	.
1957	Switz.	-3.58	-0.83	2	3	0	0	0	9	.
1957	Portugal	-0.02	3.50	2	0	0	0	0	9	.
1957	NZL	-1.65	1.66	3	0	0	0	0	9	.
1957	Peru	-3.27	2.25	3	0	0	0	0	9	.
1957	Thailand	-1.21	2.74	2	0	0	0	0	9	.
1957	China	-29.52	-7.12	8	8	2	0	1	9	.
1958	LUX	-0.44	0.23	2	0	0	0	0	2	.
1958	Spain	-3.64	-1.19	2	5	0	0	0	2	.
1958	Turkey	-10.59	0.00	6	2	3	0	0	2	.
1958	Chile	-4.04	1.19	2	0	0	0	0	2	.
1958	Mexico	-1.18	1.42	2	0	0	0	0	2	.
1958	India	-0.01	1.65	2	0	0	0	0	2	.
1958	Korea	-3.45	2.36	5	0	0	1	0	2	.
1959	Philippines	-1.58	-1.91	2	2	0	0	0	0	.
1960	Australia	-0.91	0.29	2	0	0	0	0	1	B
1960	Mexico	-0.40	2.76	2	0	0	0	0	1	.
1961	Greece	-0.23	-1.00	2	19	0	0	1	2	.
1961	NZL	-0.22	2.28	2	0	0	0	0	2	D
1961	Indonesia	-8.01	3.60	9	0	0	1	0	2	.
1961	Korea	-0.80	3.51	2	0	0	0	0	2	B
1962	Colombia	-0.15	2.57	2	0	0	0	0	0	.
1964	Chile	-1.24	1.59	2	0	0	0	0	0	.
1964	Colombia	-2.00	2.74	2	0	0	0	0	0	.
1964	Israel	-4.43	3.30	2	0	0	0	0	0	.
1964	India	-7.01	1.92	4	0	0	0	0	1	.
1964	Indonesia	-0.80	1.79	4	0	0	1	0	0	.
1965	Ireland	-0.05	-0.32	2	8	0	0	0	1	.
1966	Germany	-0.66	-1.92	2	4	0	0	1	2	B
1966	NZL	-8.47	3.04	6	0	0	1	0	2	B
1966	Israel	-0.97	3.30	3	0	0	0	0	2	.

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Table A2 (*continued*)

Year	Country	Percent change Peak to trough GDP	Peak to trough E	Number of years Peak to recovery GDP	Peak to recovery E	Diff. in peaks	Double dip GDP	Double dipE	No. of recess	Shocks
1966	Indonesia	-0.63	1.79	2	0	0	0	0	2	.
1966	China	-7.07	9.18	4	0	0	0	0	2	.
1967	Peru	-2.44	1.80	3	0	0	0	0	1	.
1968	UK	-1.32	0.00	2	4	1	0	0	1	B
1968	Indonesia	-1.36	1.80	2	0	0	0	0	1	D
1969	US	-0.96	0.55	2	0	0	0	0	2	B
1969	NZL	-1.85	2.48	2	0	0	0	0	2	B
1969	India	-4.11	7.08	6	0	0	1	0	2	B
1971	SA	-1.15	0.88	2	0	0	0	0	0	B
1971	Chile	-26.64	-7.05	9	6	2	0	0	14	.
1971	China	-0.91	2.78	2	0	0	0	0	0	.
1973	US	-2.56	-1.28	3	2	1	0	0	14	S
1973	UK	-4.24	-0.26	4	5	1	0	0	14	S
1973	Denmark	-3.50	-1.50	3	3	0	0	0	14	.
1973	Japan	-2.59	-0.39	3	3	0	0	0	6	S
1973	Greece	-7.55	0.62	3	0	0	0	0	6	S
1973	Portugal	-6.22	10.03	4	0	0	0	0	14	S
1973	India	-1.15	3.19	2	0	0	0	0	6	S
1974	Austria	-0.51	-0.33	2	2	0	0	0	14	B
1974	Belgium	-1.59	-1.47	2	16	0	0	1	14	B
1974	France	-1.65	-0.55	2	2	0	0	0	14	B
1974	Germany	-0.81	-1.57	2	5	0	0	0	14	B
1974	Italy	-2.67	0.01	2	0	0	0	0	14	.
1974	LUX	-7.59	0.92	5	0	0	0	0	14	B
1974	NLD	-0.89	-0.01	2	2	0	0	0	14	S
1974	Switz.	-9.20	-5.49	6	10	0	0	1	14	B
1974	Spain	-0.59	-1.71	2	23	0	0	1	14	S
1974	NZL	-3.07	2.60	9	0	0	1	0	14	B
1974	SA	-4.02	2.38	6	0	0	0	0	14	B
1974	Malaysia	-1.63	3.34	2	0	0	0	0	14	B
1975	Ireland	-0.28	-0.81	2	2	0	0	0	2	.
1975	Peru	-8.85	7.02	31	0	0	1	0	3	B
1975	Israel	-3.81	5.21	4	0	0	0	0	3	.
1975	India	-0.54	3.28	2	0	0	0	0	2	D
1975	China	-5.03	2.84	3	0	0	0	0	2	.
1976	Sweden	-1.94	0.17	3	0	0	0	0	3	B
1976	Australia	-0.23	0.90	2	0	0	0	0	3	B
1976	NZL	-4.46	0.23	5	0	0	0	0	3	B
1977	Austria	-0.10	0.38	2	0	0	0	0	1	B
1977	Turkey	-8.35	4.72	7	0	0	0	0	4	S
1978	Spain	-0.89	-2.13	2	11	0	0	1	1	D
1978	India	-7.46	2.93	3	0	0	0	0	1	S
1979	US	-1.20	0.26	2	0	0	0	0	4	S
1979	UK	-2.85	-3.28	4	9	0	0	0	8	B
1979	Denmark	-1.28	-2.10	3	6	0	0	0	8	.
1979	Greece	-6.68	-0.32	10	4	2	1	0	8	S
1979	Israel	-0.32	0.75	2	0	0	0	0	4	S
1979	Korea	-3.13	0.45	2	0	0	0	0	4	S
1979	Hungary	-0.11	-0.60	2	2	0	0	1	4	.
1980	Austria	-0.08	-0.91	2	9	0	0	1	8	B
1980	Belgium	-0.40	-1.78	2	9	0	0	0	8	B
1980	LUX	-0.76	0.00	2	3	1	0	0	8	B
1980	NLD	-3.07	-2.07	4	6	0	0	0	8	B
1980	Spain	-0.86	-2.37	3	8	0	0	0	8	B
1980	Brazil	-13.44	10.99	6	0	0	0	0	8	.
1980	Colombia	-2.03	6.76	6	0	0	0	0	8	B
1981	US	-2.76	-0.77	2	2	0	0	0	8	B
1981	Germany	-0.16	-0.81	2	5	0	0	1	8	B
1981	Norway	-0.07	-0.01	2	3	0	0	0	8	B
1981	Switz.	-1.72	0.24	3	0	0	0	0	8	B
1981	Canada	-4.26	-3.49	3	4	0	0	0	8	B
1981	Australia	-3.61	-0.25	3	3	0	0	0	8	B
1981	SA	-7.38	3.57	25	0	0	1	0	8	B
1981	Chile	-20.53	-1.23	8	3	0	0	0	8	B
1981	Mexico	-9.52	3.51	16	0	0	1	0	8	S
1981	Peru	-15.98	8.52	25	0	0	1	0	8	D
1981	Indonesia	-0.09	7.60	2	0	0	0	0	8	B

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Table A2 (*continued*)

Year	Country	Percent change Peak to trough GDP	Peak to trough E	Number of years Peak to recovery GDP	Peak to recovery E	Diff. in peaks	Double dip GDP	Double dipE	No. of recess	Shocks
1982	Iceland	-3.35	0.32	3	0	0	0	0	4	.
1982	Ireland	-1.00	-0.82	2	8	0	0	1	4	.
1982	Portugal	-2.59	-0.20	3	4	1	0	0	4	S
1982	Philippines	-21.49	10.53	22	0	0	1	0	4	S
1983	Austria	0.00	-0.10	2	2	0	0	0	2	S
1983	Israel	-0.73	0.00	2	2	1	0	0	2	S
1984	SA	-5.83	7.66	20	0	0	1	0	2	S
1984	Peru	-0.26	2.46	2	0	0	0	0	0	S
1984	Malaysia	-5.45	3.91	4	0	0	0	0	1	B
1985	Ireland	-0.61	-0.45	2	2	0	0	0	1	B
1985	Mexico	-6.68	10.13	6	0	0	0	0	3	S
1986	Greece	-2.73	0.12	2	0	0	0	0	2	B
1986	NZL	-5.03	0.62	8	0	0	1	0	2	B
1987	Denmark	-0.11	-0.44	2	10	0	0	1	3	B
1987	Norway	-0.71	-0.64	3	9	0	0	0	3	B
1987	Iceland	-1.98	-5.40	10	11	0	1	1	3	S
1987	Brazil	-1.97	3.39	10	0	0	1	0	3	.
1987	Peru	-34.67	6.10	18	0	0	1	0	4	S
1988	Turkey	-1.54	2.32	2	0	0	0	0	2	B
1988	NZL	-4.21	-2.62	5	6	0	0	0	9	B
1988	Israel	-1.57	1.00	2	0	0	0	0	2	S
1988	China	-2.53	6.97	3	0	0	0	0	4	.
1989	Canada	-4.91	-2.70	6	4	1	0	0	9	B
1989	Greece	-0.73	1.06	2	0	0	0	0	4	S
1989	Australia	-2.62	-2.22	3	4	1	0	0	9	B
1989	SA	-11.52	12.76	14	0	0	1	0	13	B
1989	Brazil	-9.59	2.99	6	0	0	0	0	9	S
1989	Hungary	-19.50	-20.02	11	28	0	0	1	13	S
1990	US	-1.07	-1.19	2	3	0	0	0	9	B
1990	UK	-1.37	-2.67	3	9	0	0	0	9	B
1990	Sweden	-6.48	-10.61	5	22	0	0	1	13	B
1990	Switz.	-4.28	-1.49	8	8	1	1	1	13	S
1990	Finland	-11.72	-17.59	7	17	0	0	0	13	B
1990	Iceland	-5.64	-0.49	6	4	0	1	0	9	B
1990	Turkey	-0.77	3.55	2	0	0	0	0	9	S
1990	India	-1.62	2.63	2	0	0	0	0	9	S
1990	Philippines	-5.47	10.85	6	0	0	0	0	13	S
1991	Greece	-3.09	3.13	5	0	0	0	0	13	B
1991	Peru	-2.56	0.11	2	0	0	0	0	7	S
1992	Austria	-0.25	-0.59	2	4	0	0	0	13	B
1992	Belgium	-1.37	-0.64	2	3	0	0	0	13	B
1992	Denmark	-0.36	-1.59	2	2	0	0	0	13	B
1992	France	-1.09	-0.98	2	3	0	0	0	13	B
1992	Germany	-1.55	-1.36	2	6	0	0	0	13	S
1992	Italy	-0.92	-2.68	2	8	0	0	0	13	B
1992	Japan	-0.82	0.35	3	0	0	0	0	13	B
1992	Portugal	-2.52	-1.71	3	5	0	0	0	13	B
1992	Spain	-1.35	-3.04	2	5	0	0	0	13	B
1993	Turkey	-7.20	7.63	3	0	0	0	0	0	S
1994	Switz.	-0.41	-0.13	3	4	0	0	0	2	B
1994	Iceland	-0.82	3.38	2	0	0	0	0	2	B
1994	Mexico	-8.32	-0.53	3	2	0	0	0	2	S
1995	LUX	-0.04	2.66	2	0	0	0	0	2	B
1996	Thailand	-13.11	-2.97	6	3	1	0	0	1	B
1997	Japan	-1.73	-2.58	3	20	0	0	1	1	B
1997	SA	-1.11	1.84	3	0	0	0	0	1	B
1997	Brazil	-2.78	4.94	5	2	0	1	0	1	S
1997	Colombia	-6.72	-1.26	7	2	1	0	0	1	B
1997	Peru	-1.88	4.31	5	0	0	1	0	1	S
1997	Indonesia	-15.67	1.27	8	0	0	0	0	1	S
1997	Korea	-6.54	-5.86	2	4	0	0	0	1	B
1997	Malaysia	-10.15	0.24	5	0	0	1	0	1	B
1997	Philippines	-2.78	1.07	3	0	0	0	0	1	B
1998	Turkey	-5.00	1.05	5	0	0	1	0	1	B
1998	Chile	-2.03	-1.23	2	2	0	0	0	1	B
2000	US	-0.02	0.00	2	3	0	0	0	1	B
2000	Turkey	-7.64	0.00	3	3	1	0	0	1	B

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Table A2 (*continued*)

Year	Country	Percent change Peak to trough GDP	Peak to trough E	Number of years Peak to recovery GDP	Peak to recovery E	Diff. in peaks	Double dip GDP	Double dipE	No. of recess	Shocks
2000	Brazil	-0.09	0.74	2	0	0	0	0	1	S
2000	Mexico	-3.00	2.66	5	0	0	0	0	6	B
2000	Peru	-0.71	1.38	2	0	0	0	0	1	S
2000	Israel	-4.35	2.39	5	0	0	0	0	6	B
2000	Malaysia	-1.67	0.63	2	0	0	0	0	1	B
2001	Germany	-0.90	-1.57	3	6	0	0	0	6	B
2001	Italy	-0.71	3.70	3	0	0	0	0	6	B
2001	NLD	-0.75	-0.47	3	4	1	0	0	6	B
2001	Switz.	-1.03	-0.44	3	3	1	0	0	6	B
2001	Japan	-0.02	-1.24	2	4	0	0	0	6	B
2001	Iceland	-0.17	-1.49	2	4	0	0	0	6	D
2002	Portugal	-1.35	-0.93	2	15	0	0	1	5	B
2002	Brazil	-0.15	1.63	2	0	0	0	0	5	D
2007	US	-4.51	-3.60	6	7	0	0	0	21	B
2007	UK	-6.79	-1.33	8	4	1	0	0	21	B
2007	Denmark	-6.57	-3.21	9	9	1	1	1	21	B
2007	France	-3.85	-1.06	8	4	1	1	1	21	B
2007	Italy	-7.25	-2.02	10	10	0	1	1	21	B
2007	LUX	-10.19	6.72	10	0	0	1	0	21	B
2007	Norway	-4.29	0.33	10	3	1	1	0	21	B
2007	Sweden	-7.52	-2.47	7	3	1	1	0	21	B
2007	Canada	-4.30	-1.76	5	2	1	0	0	21	B
2007	Japan	-6.72	-1.12	6	8	0	1	1	21	B
2007	Greece	-30.29	-17.79	10	9	1	1	1	21	B
2007	Ireland	-12.55	-7.74	8	10	0	1	1	21	B
2007	Portugal	-3.11	-2.75	10	9	1	1	1	21	B
2007	Spain	-11.04	-16.25	10	10	0	0	0	21	B
2007	Turkey	-6.45	1.72	3	0	0	0	0	21	B
2007	NZL	-2.62	1.02	5	0	0	1	0	15	B
2007	Mexico	-7.52	-0.89	5	2	1	0	0	21	B
2008	Austria	-4.22	-0.41	8	2	0	1	0	21	B
2008	Belgium	-3.03	-0.22	3	2	0	0	0	21	B
2008	Germany	-5.58	0.14	3	0	0	0	0	21	B
2008	NLD	-4.19	-1.01	8	9	0	1	1	21	B
2008	Switz.	-3.43	0.40	6	0	0	1	0	21	B
2008	Finland	-9.06	-2.46	9	9	0	1	1	21	B
2008	Iceland	-13.51	-6.71	8	6	0	0	0	21	B
2008	SA	-2.65	-2.38	3	3	0	0	0	21	B
2008	Brazil	-1.11	0.89	2	0	0	0	0	21	S
2008	Chile	-2.58	-0.79	2	2	0	0	0	21	B
2008	Peru	-0.16	2.27	2	0	0	0	0	21	S
2008	Israel	-1.05	2.54	2	0	0	0	0	21	D
2008	Malaysia	-3.33	2.37	2	0	0	0	0	21	B
2008	Philippines	-0.46	2.73	2	0	0	0	0	21	B
2008	Thailand	-1.20	1.36	2	0	0	0	0	21	B
2008	Hungary	-6.51	-2.66	6	6	0	1	1	21	B
2009	NZL	-0.11	0.61	2	0	0	0	0	5	B
2010	Japan	-0.08	-0.01	2	3	0	0	0	5	D
2010	Portugal	-5.91	-8.71	7	7	0	1	1	14	B
2011	Austria	-0.68	1.73	5	0	0	0	0	14	B
2011	Belgium	-0.81	-0.19	4	2	1	0	0	14	B
2011	Denmark	-0.27	-0.60	2	3	0	0	0	14	B
2011	France	-0.17	0.32	3	0	0	0	0	14	B
2011	Italy	-4.45	-3.63	6	6	0	0	0	14	B
2011	LUX	-2.72	2.39	3	0	0	0	0	14	B
2011	NLD	-1.86	-1.43	4	5	0	0	0	14	B
2011	Sweden	-1.09	0.79	3	0	0	0	0	14	D
2011	Switz.	-0.27	1.96	2	0	0	0	0	14	B
2011	Finland	-4.40	-1.27	6	5	1	0	0	14	B
2011	Ireland	-0.30	-0.67	2	2	0	0	0	14	S
2011	Hungary	-1.36	0.26	2	0	0	0	0	14	S
2012	Norway	-0.25	1.16	2	0	0	0	0	9	B
2012	Mexico	-0.06	0.86	2	0	0	0	0	9	B
2013	Brazil	-9.42	-1.82	4	2	2	0	0	2	D
2014	Greece	-0.02	0.97	2	0	0	0	0	2	D
2014	SA	-0.83	4.46	3	0	0	0	0	2	B
2015	Portugal	-2.24	1.49	2	0	0	0	0	1	B

Notes: We divide real GDP using national accounts by population, both collected from Penn World Tables 9.1, to calculate per capita GDP. We gathered data on all recessions and recoveries using the Bry and Boschan (1971) algorithm as coded by Jorda et al. (2013). The first column is the year a recession starts. The second columns is country name. The third and fourth columns report the amplitude of the peak to trough fall in GDP per capita and employment, respectively, in percentage terms. The fifth and sixth columns shows the duration of the recovery of GDP and employment, respectively, in years, where a value of zero indicates that employment never declined in the recession. The seventh column lists the difference in years between the peaks of GDP and employment. In cases where employment continued to increase more than two years after the recession started, we entered a value of zero for the duration of the recovery of employment. The next two columns show if the recession is characterized by a double dip in GDP and in employment, respectively. Then the next column reports the number of advanced economies that experience a recession simultaneously. The final column is the nature of the shock: D denotes demand shocks; S denotes supply shocks and B denotes both shocks. The missing item is a case where the number of observations is not enough to identify shocks.
Sources: Authors' calculations.

References

Alberola-Ila, Enrique, Arslan, Yavuz, Cheng, Gong, Moessner, Richhild, 2020. The fiscal response to the COVID-19 crisis in advanced and emerging market economies. BIS Bull. 23, 1–9.

Asian Development Bank (2020), "Updated Assessment of the Potential Economic Impact of COVID-19," ADB Brief no.133 (May).

Bayoumi, Tamim, 2017. Unfinished Business: The Unexplored Causes of the Financial Crisis and the Lessons Yet to be Learned. Yale University Press, New Haven.

Bayoumi, Tamim, Eichengreen, Barry, 1993. Shocking aspects of european monetary unification. Francisco Torres and Francesco Giavazzi eds Adjustment and Growth in the European Monetary Union. Cambridge University Press, Cambridge, pp. 193–229.

Bayoumi, Tamim, Eichengreen, Barry, 2020. Aftershocks of monetary unification: hysteresis with a financial twist. J. Bank. Finance 113.

Beach, Brian, Clay, Karen, Saavedra, Martin, 2020. The 1918 influenza pandemic and its lessons for COVID-19. In: NBER Working Paper no.27673 (August).

Bivens, Josh (2015), "Why is Recovery taking so long – and who's to blame?" *Economic Policy Institute Report* epi/org/110211.

Blanchard, Olivier, Quah, Danny, 1989. The dynamic effects of aggregate demand and supply disturbances. Am. Econ. Rev. 78, 655–673.

Bry, Gerhard, Boschan, Charlotte, 1971. Cyclical Analysis of Time Series: Selected Procedures and Computer Programs. National Bureau of Economic Research, New York.

Cerra, Valerie, Panizza, Ugo, Saxena, Sweta, 2009. International evidence on recovery from recessions. In: IMF Working Paper no. WP/09/183 (August).

Deb, Saubhik, 2005. Trade first and trade fast: a duration analysis of recovery from currency crisis. In: Working Paper no.2006-07. Department of Economics, Rutgers University, New Brunswick, NJ (September).

Eichengreen, Barry, Gupta, Poonam, Choudary, Rishabh, 2020. Inflation targeting in India: an interim assessment. India Policy Forum (forthcoming).

Garrett, Thomas, 2007. The 1918 Influenza Pandemic: Implications for a Modern-Day Pandemic. Federal Reserve Bank of St. Louis. Working Paper(November).

Groshen, Erica, Potter, Simon, 2003. Has structural change contributed to a jobless recovery. Federal Reserve Bank New York Curr. Issues 9 (8), 1–7.

Hegarty, Caitlin, Wilson, Beth Anne, 2017. Recoveries and Trade: Does the Exchange Rate Regime Matter? Board of Governors of the Federal Reserve System, Washington, D.C. IFDP Notes(June).

Ilzetzki, Ethan, Reinhart, Carmen M., Rogoff, Kenneth S., 2019. Exchange arrangements entering the twenty-first century: which anchor will hold? Q. J. Econ. 134 (2), 599–646.

International Monetary Fund, 2020. World Economic Outlook. IMF, Washington, D.C. (April).

Jaimovich, Nir, Siu, Henry, 2012. The trend is the cycle: job polarization and jobless recoveries. In: NBER Working Paper no.18334 (August).

Jorda, Oscar, Schularick, Moritz, Taylor, Alan, 2013. When credit bites back. J. Money Credit Bank. 45, 3–28.

Kannan, Prakash, Scott, Alasdair, Terrones, Marco, 2009. From Recession to Recovery: How Soon and How Strong? International Monetary Fund unpublished manuscript.

Laeven, Luc, Valencia, Fabian, 2018. Systemic banking crises revisited. In: IMF Working Paper no. WP/2018/206 (September).

Nickel, Christiane, Tudyka, Andrew, 2013. Fiscal stimulus in times of high debt: reconsidering multipliers and twin deficits. In: ECB Working Paper no.1513 (February).

OECD, 2012. Financial contagion in the era of globalized banking. In: OECD Economics Department Policy Note no.14 (June).

Olney, Martha, Pacitti, Aaron, 2017. The rise of services, deindustrialization, and the length of economic recovery. Econ. Inq. 55, 1625–1647.

Reinhart, Carmen, Rogoff, Kenneth, 2009. This Time is Different: Six Centuries of Financial Folly. Princeton University Press, Princeton.

Stock, James, Watson, Mark, 2012. Disentangling the channels of the 2007–2009 recession. In: NBER Working Paper no.18-94 (May).

Terrones, Marco, 2019. Do fixers perform worse than non-fixers during global recessions and recoveries?. In: MIRA Paper no.91783 (January).

Tsangarides, Charalambos, 2010. Crisis and recovery: role of the exchange rate regime in emerging market economies. In: IMF Working Paper WP/10/242 (October).

Velde, Francois, 2020. What happened to the US economy during the 1918 influenza pandemic? A view through high-frequency data. In: Federal Reserve Bank of Chicago Working Paper 2020-11.