Labor Market Anatomy of a Macroeconomic Crisis*

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Abstract

This paper uses global, harmonized micro data from labor force surveys to document the labor market effects of economic crises. There is a close correspondence between severe labor market downturns and a small set of crisis events, notably banking panics, sudden stops, and house price busts. Crises fall disproportionately on marginal workers – younger, less-educated, and lower-earnings workers – and employment losses are concentrated in the manufacturing and construction sectors. We provide aggregate and distributional evidence on several mechanisms discussed in the literature, including exchange rate regimes and devaluation.

Keywords: financial crisis, house price bust, sudden stop, unemployment, idiosyncratic risk

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1. Introduction

Globally, large downturns involving declines of at least 15 percent in output and consumption occur at a frequency of roughly 1–2 percent per year (Barro, 2006; Barro and Ursúa, 2008). Despite their rarity, these events are central to understanding macroeconomic and financial activity.[1] Yet their infrequency makes them challenging to study. For example, Cogley (1990) points to their absence from the U.S. postwar experience as an important reason for the limited welfare cost of U.S. business cycles in the calculation of Lucas, Jr. (1987).

A separate quantitative literature emphasizes that business cycles have higher welfare costs when heterogeneous agents face uninsurable idiosyncratic risk, particularly long-term unemployment risk (Atkeson and Phelan, 1994; Storesletten et al., 2001; Krusell et al., 2009). In principle these two forces can interact if crises raise exposure to uninsurable risk for workers. However, studying the roots of this critical labor market heterogeneity faces an important empirical roadblock. Rarely do we observe the type of large downturns required to understand the employment consequences of crises, making U.S. data alone unsuitable for the task. Moreover, understanding the micro-level labor market consequences of crises naturally requires micro labor market data. Pinning down this interaction is important both for measuring welfare costs and for evaluating the effectiveness of macroprudential policy (Svensson, 2017; Allen and Greenwald, 2022; Guntin et al., 2023).[2]

Our contribution is to use newly harmonized micro data derived from rotating panel labor force surveys conducted around the world to study the heterogeneous effects of rare crises. The dataset covers 81 million observations, where each observation is one person matched for two consecutive quarters. We measure labor market states and flows

[1] See Rietz (1988) for an early theory, and Barro (2006), Gabaix (2012), Nakamura et al. (2013), Wachter (2013), Farhi and Gabaix (2016), and Barro and Liao (2021) for more recent views on the equity premium puzzle and other applications to finance. Guntin et al. (2023) study household-level consumption responses to five macroeconomic crises.

[2] More speculatively, labor markets are a promising avenue for delivering much-needed amplification to allow models to generate long, slow recoveries. Recent work finds that the cyclical properties of labor markets may further help improve our understanding of the nature of shocks (Dupraz et al., 2025; Hall and Kudlyak, 2022).

for workers in different demographic groups, with different earnings levels, and working in different sectors. The dataset is an unbalanced panel spanning 42 countries and 91 recessions. It covers a number of sharp economic contractions absent from U.S. data. Together, the data allow us to trace the propagation of economic crises through the labor market at a granular level.[3]

Our first step is to link rare macroeconomic disasters to severe labor market downturns. For this, we start at a more aggregate level. We build a cross-country dataset consisting of the aggregate quarterly unemployment rate and real GDP growth rate for all countries that publish these statistics. This dataset has the benefit of breadth relative to our harmonized micro dataset: it is an unbalanced panel spanning 88 countries and 323 recessions, where we define a recession as any period of two or more consecutive quarters of negative real GDP per capita growth.[4]

We study the distribution of labor market outcomes during recessions. We focus on the severity of each downturn, which captures how much the unemployment rate rises from onset to trough, and the duration, which captures how long it takes for the economy to progress from onset to trough. The distribution of each measure shows a long right tail of severe outcomes. For example, the ten percent most severe downturns see the unemployment rate rise by 9–20 percentage points. The ten percent longest downturns last 14–29 quarters before unemployment begins to recover. The only U.S. recession that appears among this group is the sharp but brief COVID recession. Thus, U.S. data contain little information about the most severe labor market downturns.

We link these severe labor market downturns with crises. We draw on external databases and rules identifying a wide range of shocks that may correlate with or cause particularly severe downturns. In our classification, crises are a subset of recessions. They also turn out to be the most severe in terms of labor market outcomes. We find that nine of the ten most severe labor market downturns in our data are associated with one

[3]The database is an expanded version of the one we previously used to study labor market dynamics and development (Donovan et al., 2023). The unbalanced panel runs from as early as 1976 to as recently as early 2025. Details, code, and aggregated tabulations of the data are available at www.lfsdata.com.

[4]This dataset covers as early as 1948 through early 2025.

of three shocks: banking panics, house price busts, or sudden stops. Seven are associated with two or more of these shocks happening at the same time, a phenomenon that we label a compound crisis. Our work intersects with a substantial literature that documents the macroeconomic importance of these events.[5] Our contribution is to characterize the labor market anatomy of these downturns using harmonized microdata, including the underlying worker flows and the distribution of losses across worker types and sectors. We estimate that labor market downturns during a crisis are associated with a 0.6 percentage point larger rise in the unemployment rate and last 1.1 quarters longer than the typical recession; for compound crises the same figures are 4.4 percentage points larger and 5.7 quarters longer than for typical recessions. While our estimates cannot be viewed as evidence on the causal effect of experiencing a crisis or a recession, we do find similar effects when controlling for country fixed effects or a wide range of macroeconomic policies or conditions. This helps mitigate the concern that the effects proxy for underlying differences in the policies or conditions of countries that experience a crisis.

Our second step is to use the micro-level dataset to investigate the impact of crises further. This dataset allows us to fill in details of crises beyond those provided by the aggregate data. Crises involve not only a rise in the unemployment rate, but also falling employment-population ratios. Moreover, whereas long-term unemployment plays a negligible role in non-crisis recessions, it rises by 1.5 percentage points during crises and 6.6 percentage points during compound crises. We use the panel structure of the data to decompose the rising unemployment rate into the underlying contribution of rising separation rates and falling job-finding rates and find that they each contribute roughly equally, building on recent work on the relative importance of these two margins for unemployment fluctuations (Hall, 2005; Fujita and Ramey, 2009; Shimer, 2012; Elsby et al., 2013).

We then turn to understanding who is affected by recessions and crises. An existing

[5]See Calvo (1998) and Calvo et al. (2004) for sudden stops; Reinhart and Rogoff (2009), Claessens et al. (2009), and Jordà et al. (2013) for financial crises and credit contractions; and Claessens et al. (2009) and Mian and Sufi (2014) for housing busts. Kaminsky and Reinhart (1999) and Claessens et al. (2009) also show the aggregate importance of compound crises.

literature shows that marginal workers are more affected by labor market risk such as unemployment, especially during crises.[6] We use our database to show that this finding holds broadly across a wide range of countries and labor market outcomes. We differentiate workers based on age, education, and initial earnings level. We find that younger, less educated, and lower-earnings workers are consistently more exposed to separation, unemployment, and long-term unemployment risk than their older, more educated, and higher-earnings peers. In many cases, the most affected group of workers faces two to three times the increase in unemployment of the least affected group of workers. Thus, the workers whom we expect to be least able to self-insure against idiosyncratic income risk are exactly the people who bear the brunt of the worst periods of economic upheaval. Guntin et al. (2023) find high consumption-income elasticities in the five crisis events for which they have access to microdata on consumption. If this finding applies more broadly, then the implication is that crises are also likely episodes of substantial consumption volatility.

Our third step is to combine our labor market data with external indicators of macroeconomic conditions and policy to test mechanisms the literature proposes for crisis severity. Previous work documents that fixed exchange rates are associated with more severe crises and that abandoning them speeds recovery (Eichengreen and Sachs, 1985; Domaç and Martinez Peria, 2003). This can be due to the costly actions governments take to defend their exchange rate (Obstfeld and Rogoff, 1995; Kaminsky and Reinhart, 1999), to the fact that fixed exchange rates and downward nominal wage rigidities imply real wage rigidity (Schmitt-Grohé and Uribe, 2013), or to the fact that economies with fixed exchange rates experience booms generated by overborrowing and then busts (Schmitt-Grohé and Uribe, 2016). Inflation and currency devaluation are escape valves against these forces, generating a tradeoff between jobless and wageless recoveries (Schmitt-Grohé

[6]See Altonji and Blank (1999) for a classic overview of research on differences in labor market outcomes by worker characteristics in the United States. Cajner et al. (2017) provide a recent update that focuses on the cyclical behavior of differences. A number of papers study cross-group responses to the Great Recession, including Hoynes et al. (2012), Elsby et al. (2010), and Yagan (2019) for the United States, Bentolila et al. (2012) for two European countries, and Cho and Newhouse (2013) for 17 middle-income countries. Finally, Verick (2009) studies the progression of youth unemployment during a number of crises, including both the Great Recession and a set of other large, recent crises of note.

and Uribe, 2013; Na et al., 2018; Calvo et al., 2025; Blanco et al., 2025). We add to the evidence in support of these mechanisms by documenting interactions between exchange rate policy or inflation and the extent of labor market downturns. We also show that these results have significant consequences for marginal workers, whose unemployment rate can rise by 10 percentage points more than their peers.

2. Data

We begin by discussing the three sources of data we use. First, we construct a quarterly database of real gross domestic product (GDP) per capita growth rates. We use these data to identify when recessions occur. We then construct two different datasets on labor market performance, each derived from labor force surveys. These surveys are conducted by government statistical offices and are the source for official labor market statistics such as the labor force participation rate or the unemployment rate. Countries differ in the regularity and frequency with which they collect such surveys, with some countries changing practices over time. We focus on countries and periods where data are collected at a quarterly frequency. The aggregate labor dataset consists of the quarterly unemployment rate for all countries that calculate and publish it. The micro labor dataset is built from the subset of these labor force surveys that make micro data available to researchers and that also use a rotating panel design. We describe each dataset in turn.

2.1. Real GDP per Capita Data

We first compile data on real, seasonally adjusted GDP per capita for as many countries as possible. We use these data to define the dates of recessions in a consistent way across countries.

We start by collecting data on quarterly real GDP or quarterly real GDP growth rates. Our sources include the Eurostat, OECD, and IMF databases on national accounts statistics. We supplement these sources with data from the respective countries' national statistical offices. See Appendix A for details on the sources and data availability by country. We convert all series to quarterly growth rates. We use seasonally adjusted figures whenever they are available. When they are not, we adjust the series ourselves

by measuring the implied quarterly growth rate from the year-over-year change in real GDP. This choice is a useful compromise because it works well for shorter samples as we have in some countries but also allows for flexibility to fit countries whose seasonal cycles are changing over time.

We collect annual population data from World Bank (2025). We measure quarterly real GDP per capita growth rates by subtracting one-quarter of the annual population growth from the real GDP growth rate. This step is mostly useful for facilitating comparisons between countries with high and low rates of population growth, such as emerging versus developed economies.

Throughout the paper we define a recession in a consistent way across all countries as any period of two or more consecutive quarters of negative real GDP per capita growth. This definition is consistent with the common rule of thumb suggested in textbooks and ensures that our measurement is consistent across countries. It produces some double-dip recessions; if two recessions are separated by only a single quarter of positive growth, we aggregate them into a single recession. Note that this definition agrees in most but not all cases with officially designated recessions in the United States; for example, by our measure there was no recession in 2001.

2.2. Aggregate Labor Data

Our aggregate dataset consists of the official quarterly series for the unemployment rate computed from labor force surveys for all countries and years for which we have been able to collect this data.[7] Most of our data are sourced from the Eurostat, OECD, and ILO databases on labor market statistics. We also supplement these sources with data from the respective countries' national statistical offices. See Appendix A for details on the sources and data availability by country.

We collect the aggregate unemployment rate from each source. The details of how this moment is constructed vary slightly by country. Some countries construct the unemployment rate for the entire labor force, whereas others (such as EU countries) focus on

[7] We exclude data on registered unemployment, which is sensitive to the structure of the unemployment insurance system.

people aged 15–74. Countries also differ slightly in how they define who is unemployed.[8] An advantage of the micro dataset is that we can harmonize the population of interest as well as how we measure unemployment. We use seasonally adjusted figures whenever they are available. When they are not, we adjust the series ourselves by estimating and removing proportional quarter-of-year fixed effects as in Donovan et al. (2023).

We focus on countries for which we have overlapping series of quarterly unemployment and quarterly real GDP per capita growth rates and for which the unemployment data span at least five years. The resulting database is an unbalanced panel covering 88 countries from as early as 1948 to as late as 2025. See Table A1 for countries and time periods covered. The main advantage of this aggregate dataset is its breadth; in total, it covers 323 recessions (Table A1 shows the distribution of recessions across countries). The main disadvantage is that aggregate data cannot tell us how shocks are transmitted to individuals or who is affected. We complement our analysis with a micro dataset that covers fewer countries and recessions but offers a wealth of details on workers' demographics, labor force status, and labor market dynamics.

2.3. Micro Labor Data

Our second dataset draws on micro data from labor force surveys from a large number of countries worldwide. We are collecting and harmonizing these data into a database as part of an ongoing research project, which we previously used to study how labor market dynamics vary with development (Donovan et al., 2023). The current version of the database includes three main changes relative to our prior work. First, it includes data from several new countries that we have identified and acquired. Second, it expands the coverage period for other countries to include the most recently available data. Third, we have harmonized new variables that are relevant for this paper, notably the duration of unemployment and the incidence of long-term unemployment.

A detailed description of the database as well as the code and aggregated results can

[8] Hussmanns (2007) provides a useful overview of the common definitions of key labor market concepts and the conceptual and practical issues that lead countries to deviate from these definitions. As one example, some developing countries do not insist on the "search" criteria for people to be included among the unemployed.

be found in Donovan et al. (2023) or at the project website, https://www.lfsdata.com/. Here, we provide an overview of some of the key features that are relevant for the study of the relationship between crises and labor market downturns. Our database focuses on countries with quarterly labor force surveys that satisfy three criteria. First, the country uses a rotating panel design, meaning that the data track the same household for multiple periods. Second, this design allows households to be tracked for (at least) two consecutive quarters, which maximizes the number of countries that can be included in the sample. Third, the country makes the micro data with the identifiers needed to match people consistently across sample waves available to researchers.

We use the identifiers in the data to match workers across consecutive quarters. We validate these matches using the standard best practice in the literature (Madrian and Lefgren, 2000). We can then study labor market states and flows consistently across all workers and countries. We post-stratify the original weights so that the matched data and original unmatched samples have the same distribution across age, sex, education, and labor force status to help minimize the effect of attrition.

In total, the database currently consists of 55 countries. We focus again on the subset of countries with data spanning at least five years. We merge in the same measure of real GDP per capita and define recessions in the same way as we did for the aggregate dataset. Doing so allows us to compare the behavior of labor markets in aggregate and micro data after the same recessions. The resulting database is an unbalanced panel covering 42 countries and 91 recessions. A list of the countries and years included is available in Table A2.

We have harmonized a number of important variables to be consistent across countries. These include a wide range of labor market outcomes, including employment, hours worked, unemployment, and long-term unemployment.[9] For roughly one-third of countries we have information on monthly labor earnings and hourly wages; for roughly

[9]The unemployed in each country are consistently defined as non-employed people who satisfy the standard three-part test: i) they want a job; ii) they have actively searched for a job in the last four weeks or one month; and iii) they are available to start a job. We consistently define a worker as being long-term unemployed if they report having been unemployed for a year or longer.

two-thirds, we have information on monthly labor earnings measured in (country-specific) deciles. We have also harmonized information on the type of work, including occupation and industry. Finally, we have harmonized a number of covariates of interest, including demographics and education. We discuss these variables further as they become relevant.

We focus throughout on the urban population aged 16–65. Some countries do not collect data on rural areas; we restrict attention to ages 16–65 to mitigate concerns about cross-country differences in labor market institutions such as child labor laws or retirement policies. In addition, some countries collect limited data on people over age 65.

We now turn to our analysis, beginning with the behavior of labor market aggregates.

3. Aggregate Labor Market Outcomes During Recessions and Crises

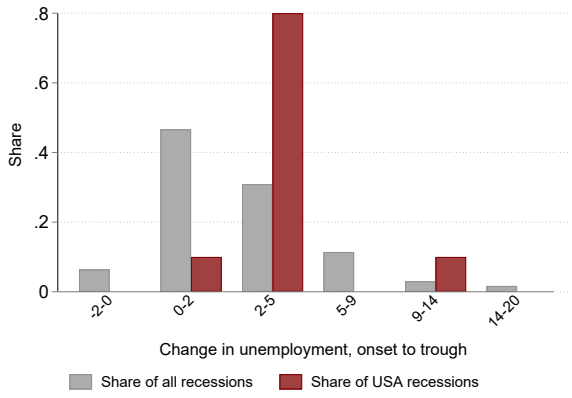
We start with the aggregate dataset to provide the broadest possible description of the labor market response to recessions. We characterize how the reported unemployment rate changes during the 323 recessions for which we have data. For each recession covered by our dataset, we define $t = 0$ as the peak of the expansion and $t = 1$ as the onset of the recession, the first quarter of falling real GDP per capita. We define the trough of the labor market downturn as the quarter when unemployment reaches a local peak and then begins a sustained recovery lasting at least four quarters. For a few recessions the labor market downturn follows an unconventional path; we give a full description of our algorithm for dating the trough of the labor market downturn and explain how we deal with these cases in Appendix B.1. For some (mostly recent) recessions, the data coverage ends before we can identify a trough.

We focus our analysis on two measures of the extent of the labor market downturn during a recession. *Severity* measures how much the unemployment rate rises (measured in percentage points) between $t = 0$ and the trough of the downturn. *Duration* measures how many quarters pass between the onset of the recession and the trough. For recessions where we cannot identify a trough in the unemployment rate, or where missing GDP data prevent us from dating the end of the recession, these two variables are set to missing. Figure 1 provides a first look at our data in the form of a simple histogram of the severity

and duration of labor market responses to recessions.

Figure 1: Distribution of Labor Market Responses to Recessions

(a) Severity



(b) Duration

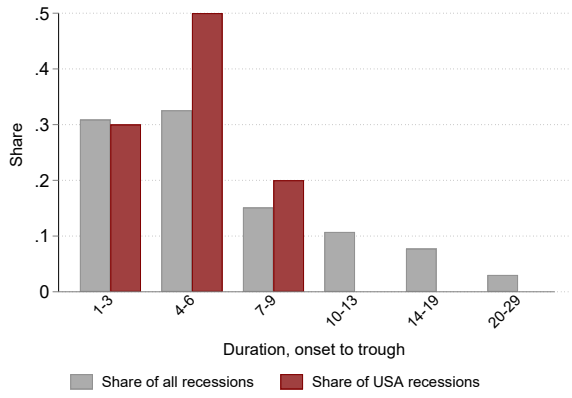


Figure 1 shows that the distribution of both severity and duration is right-skewed. While half of the recessions imply a 0–2 percentage point increase in unemployment, the right tail is long. During the ten most severe labor market downturns the unemployment rate rises by at least 10 percentage points and as much as 20 percentage points. A similar pattern emerges for duration, with the ten longest labor market downturns lasting at least 16 quarters and as long as 29 quarters before the unemployment rate first falls.

The most severe and longest labor market downturns generally come from outside the United States. To emphasize this point, Figure 1 plots in red the distribution of the severity and duration of labor market downturns from U.S. postwar recessions. The U.S. has had one labor market downturn with an unemployment rate rise greater than five percentage points – the extremely brief COVID recession. It has had no labor market downturns lasting longer than three years, whereas globally there is a long tail of events that last up to roughly seven years.

Together, these results offer a labor market parallel to existing work that studies the distribution of changes in output or consumption. It is well-known that the postwar U.S. had output volatility that was unusually low compared to samples that include more countries or longer time horizons (Cogley, 1990; Barro, 2009). Taking a more global view introduces the potential for a much different, and more severe, set of crises and downturns

(Barro, 2006; Barro and Jin, 2011).

In the next section, we investigate the longest and most severe labor market downturns further. We show that they are closely connected with crises. We then ask what types of workers are most affected during these severe labor market downturns.

3.1. Defining a Crisis

Our next goal is to show that there is a clear correlation between a small set of shocks and the most severe labor market downturns. While these results are of course not causal, the size of our aggregate dataset lets us show that the result is robust to controlling for a large number of confounding factors and to focusing on subsets of the data.

In the main text, we focus on three types of shocks. The first is banking panics, which we take from Baron et al. (2021). The second is sudden stops. We define the incidence of sudden stops using a rule following Calvo et al. (2004), which focuses on countries that have a year-over-year change in the current account that is two standard deviations larger than the country-specific sample mean. Finally, we study house price busts. There is no widespread database or commonly agreed-upon definition, so we use data from the OECD Analytical House Price Indicators and define a house price bust as when the four-quarter log change in the house price index is below the 5th percentile of the overall distribution (-0.10, roughly a ten percent decline).[10]

In each case, we say that a recession is accompanied by a crisis if one of these three types of shocks occurs the year before, during, or after the onset of the recession. In the main text, we break labor market downturns into three groups: non-crisis recessions not associated with any of these shocks; crises associated with one of these shocks; and compound crises associated with two or more shocks. We reserve the results showing the relative importance of these shocks and examining the labor market implications of alternative possible shocks to Appendix B.3.

Assembling data from many countries yields enough of these otherwise rare events to study. Our aggregate dataset spans 323 recessions. Of these recessions, 87 are crises associated with exactly one shock and 31 are compound crises affected by multiple shocks.

[10] Available online at https://data.oecd.org/price/housing-prices.htm.

Our micro dataset spans 91 recessions. Of these recessions, 18 are crises by our definition and 12 are compound crises.

3.2. The Relationship Between Severe Labor Market Downturns and Crises

Our next result is that most of the severe labor market downturns shown in Figure 1 are not just crises, but compound crises. We emphasize that our results are descriptive rather than causal. We cannot estimate the effect of exogenously shocking an economy with a recession or a crisis. Nonetheless, we find these results useful because they show that there is a close correspondence between severe labor market downturns and a few types of crises.

3.2.1. The most severe labor market downturns are during crises . . .

First, we consider the ten most severe labor market downturns in our dataset (i.e., those with the largest cumulative rise in the unemployment rate between the onset of the recession and the trough of the labor market decline). Table 1 lists the country and dates of these downturns. All of these events involve rises in the unemployment rate of more than 10 percentage points, with the largest rise hitting nearly 20 percentage points.

Table 1: Severe Labor Market Downturns and Crises

Rank	Country	Dates	Severity	Types of Crises
1	Greece	2007q2–2013q1	19.60	Bank panic, Sudden stop
2	Spain	2007q4–2013q1	17.70	Bank panic, Sudden stop
3	Finland	1990q1–1993q2	14.53	Bank panic, House price
4	Estonia	2007q3–2009q3	14.27	House price, Sudden stop
5	Latvia	2008q1–2010q2	14.13	House price, Sudden stop
6	Lithuania	2008q2–2009q4	13.80	House price, Sudden stop
7	Cyprus	2008q2–2009q3	12.89	Sudden stop
8	Serbia	2008q2–2009q1	12.51	Sudden stop
9	Costa Rica	2019q4–2020q2	11.50	
10	Ireland	2007q1–2010q2	11.03	Bank panic, House price

Ranking in terms of severity of the labor market downturn, meaning the change in the unemployment rate from the onset of the recession to the date at which the unemployment rate peaks. See text for definitions of crises.

The final column of this table lists the types of shocks that are associated with each of these downturns. Nine of the ten are associated with at least one of the shocks we highlighted in the last section (banking panics, sudden stops, and house price busts). Seven of the ten are compound crises associated with two or three of these events. Thus, while these shocks are generally rare, we see that they are nearly always present during

severe labor market downturns.[11]

3.2.2. . . . and crises have the most severe labor market downturns

The same association holds in the other direction. While most recessions are not crises, crises are systematically associated with longer and more severe labor market downturns. To see this, we regress our measures of the severity and duration of each labor market downturn on whether the downturn is associated with a crisis or a compound crisis. The results are in Table 2.

Table 2: Unemployment response to recessions: severity and duration

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis	0.590	1.362**	1.103**	1.134*	0.941	0.419
	(0.439)	(0.562)	(0.549)	(0.633)	(0.836)	(0.739)
Compound crisis	4.367***	4.622***	4.119***	5.709***	4.851***	2.343*
	(1.036)	(1.233)	(0.999)	(1.081)	(1.446)	(1.250)
Severity, GDP			0.151***			
			(0.049)			
Duration, GDP						0.606***
						(0.109)
Constant	2.174***	0.420***	-1.113**	5.691***	3.000***	1.183***
	(0.209)	(0.000)	(0.494)	(0.314)	(0.000)	(0.328)
R^2	0.172	0.498	0.568	0.114	0.358	0.461
N	298	298	298	298	298	298
Countries	84	84	84	84	84	84
Country FE	No	Yes	Yes	No	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Severity, GDP measures the log difference in real GDP per capita between peak and trough. Duration, GDP measures the time (in quarters) between peak and trough.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Columns (1)–(3) show the correlates of the severity of a labor market downturn, while columns (4)–(6) show the correlates of the duration. Columns (1) and (4) show the simplest possible specification, which includes a constant term and indicators for whether the recession is a crisis or a compound crisis. These are the only specifications with an interpretable constant, which tells us the effect of a non-crisis recession: the unemployment rate rises by 2.2 percentage points over the course of an average of 5.7

[11]The Costa Rican recession of 2019–2020 was affected by the COVID pandemic. The pandemic represents a particularly special case in our analysis for two reasons. First, it disrupted data collection, with many countries reporting no labor force survey data for one or several quarters in 2020. Second, while COVID lowered hours worked in all countries where we can measure it, the effect on the measured unemployment rate turns out to be sensitive to the details of how governments structured their COVID relief policies during the pandemic; see Appendix B.6 for details. For this reason, our main analysis focuses on the other types of shocks and we relegate the analysis of COVID to the appendix.

quarters before the recovery begins. The coefficients on crisis and compound crisis reflect the *additional* effect associated with the respective event. For example, the coefficient on compound crisis indicates that unemployment rises by three times as much during such events (2.2 + 4.4 = 6.6 percentage points in total). Similarly, the coefficients in column (4) show that labor market downturns associated with compound crises last almost six quarters longer than standard recessions.

In columns (2) and (5) we repeat the same estimation with country fixed effects, which proxy for a large number of persistent differences in macroeconomic and labor market policies. In this specification, the coefficients are estimated off of within-country, cross-recession variation. Including country fixed effects raises the estimated effect for severity of crises appreciably and severity of compound crises slightly, while the estimated effects for duration decline slightly. In Appendix B.7 we instead control for a wide range of labor market policies directly. We find that restrictive labor market policies are correlated with slower labor market recoveries but that controlling for this again does not much change the estimated severity or duration associated with crises and compound crises.

Finally, we explore controlling for the change in GDP during the recession. Specifically, in column (3) we estimate the relationship between crises or compound crises and the cumulative rise in the unemployment rate while controlling for the difference in log real GDP per capita between the peak and the trough, while in column (6) we estimate the duration of rising unemployment rates while controlling for the duration of falling real GDP per capita. These estimates speak to the mechanism through which crises generate severe labor market downturns: do they simply depress output, or do they have an additional effect that would be missed by focusing on output? The estimates reveal that the change in GDP is a very strong and statistically significant predictor of the labor market downturn. They also admit a natural interpretation. The coefficient on severity implies that each additional one log point (one percent) decline in real GDP per capita is associated with 0.15 percentage points more unemployment. The coefficient on duration implies that each additional quarter of falling real GDP per capita is associated with 0.6 more quarters of rising unemployment.

Returning to the estimates for the crises, column (3) shows that crises and compound crises have an economically and statistically significant correlation with the severity of the labor market downturn even after controlling for the decline in real GDP per capita. Column (6) shows that this is less true for duration; the estimated magnitudes fall substantially and the coefficient for compound crises is only marginally statistically significant. Thus, we conclude that crises are associated with more severe labor market downturns above and beyond their effect on declining real GDP per capita, but that their association with long durations can mostly be accounted for by the slow recovery in GDP per capita.

We provide several additional results in the Appendix. We show in Appendix B.4 that there is not much evidence of important pre-crisis trends. We show in Appendix B.5 that our estimates of the effects of crises and compound crises are not driven by the Great Recession, although it was an unusually severe event.

3.3. The Labor Market Anatomy of a Crisis

Our analysis so far used the breadth of the aggregate data to show a strong correlation between crises and severe and long-lasting labor market downturns. We now turn to the micro dataset, which spans 42 countries and 91 recessions and contains harmonized records for workers matched across consecutive quarters. In this section we use this dataset to compute aggregate moments, including many that are less commonly reported than the unemployment rate. We use the same data to study distributions of labor market statistics in Section 4.

We construct a separate measure of the trough for each recession and each labor market outcome. We apply the same basic rule of looking for the first period when the labor market outcome reaches a local extremum before improving for four quarters (again, see Appendix B.1 for details). We use this trough to measure the severity and duration for each recession and each labor market outcome. We then regress the severity for each labor market outcome on an intercept and an indicator for whether the recession was a crisis or a compound crisis. The results are shown in Table 3.[12]

Each row of this table captures a different labor market outcome. As with column (1)

[12]The corresponding results for duration are available in Appendix B.9.

of Table 2, the constant here can be interpreted as the expected severity of a recession that is not associated with a crisis. The coefficients on crisis and compound crisis reflect the additional effect associated with the respective event.

Table 3: Changes in Labor Market Outcomes During Recessions and Crises

Outcome	Crisis	Compound crisis	Constant	R^2	N	Countries	Country FE
Unemp. rate	1.937	7.004***	3.111***	0.265	72	36	No
	(1.344)	(2.044)	(0.649)				
Long-term unemp. rate	0.699	5.834***	0.779***	0.440	65	29	No
	(0.531)	(1.580)	(0.229)				
Labor force part. rate	-1.485	0.957	-2.164***	0.030	73	36	No
	(1.980)	(0.658)	(0.538)				
Employment-population ratio	-2.522	-4.404***	-2.998***	0.097	74	36	No
	(2.111)	(1.314)	(0.553)				
Hours per person	-1.407	-0.446	-2.340***	0.038	74	36	No
	(1.293)	(0.686)	(0.505)				
Hours per employed	-0.047	1.599*	-2.691***	0.037	71	35	No
	(1.329)	(0.817)	(0.786)				
Separation rate	0.299	0.765*	0.962***	0.029	74	36	No
	(0.518)	(0.443)	(0.296)				
Job-finding rate	-1.836	-3.719	-7.496***	0.032	73	35	No
	(2.141)	(2.770)	(0.929)				
Job-to-job rate	-0.156	0.463	-1.359*	0.006	59	30	No
	(0.938)	(0.790)	(0.711)				
Mean log earnings	0.713	1.687	-8.280***	0.003	32	16	No
	(3.925)	(2.915)	(2.407)				
Mean log wage	3.863	1.780	-6.228***	0.063	30	15	No
	(2.398)	(2.505)	(2.040)				

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The first six rows show the behavior of aggregate labor market stocks. The first row shows the change in the unemployment rate for this sample of countries and recessions, which is broadly in line with column (1) of Table 2. Appendix B.8 provides a formal comparison and shows that the results are qualitatively similar in general and quantitatively similar when we focus on the same set of recessions in each dataset. This suggests to us that the differences in how countries define and construct the unemployment rate are not of first-order importance for researchers interested in cyclical labor market dynamics.

The second row shows results for the long-term unemployment rate, which is the share of the labor force unemployed for a year or longer. This is a useful concept for measuring particularly severe income risk and evaluating the welfare costs of business cycles and crises. Long-term unemployment rates rise little in recessions or even crises. By contrast, they rise by a large and statistically significant 6.61 percentage points (=0.78+5.83) during compound crises.

The third and fourth rows show the results for the labor force participation rate and

the employment-population ratio. The employment-population ratio is particularly useful for mitigating concerns about using unemployment as a measure of labor slack given, for example, large cross-country differences in unemployment insurance arrangements. Employment-population ratios mirror unemployment rates: they decline by 3 percentage points during a recession and 7.4 percentage points during a compound crisis.

The fifth and sixth rows show the results for the change in weekly hours worked per person and weekly hours worked per worker, respectively. They fall by 2.3 and 2.7 hours per week during a recession. The change in hours during crises and compound crises is generally not statistically different from the change during recessions.

The seventh through ninth rows show the behavior of labor market flows, which we measure using changes in labor force status for workers matched across two consecutive quarters. The seventh and eighth rows show the importance of rising separation rates and declining job-finding rates for the rise in unemployment.[13]

One simple way to put these figures into context is to use the implications of these changes in flows for the unemployment rate by cumulating forward $u_{t+1} = (1 - jfr_t) \times u_t + sep_t \times (1 - u_t)$. Donovan et al. (2023) report the average quarterly separation rate and job-finding rate as roughly 2.5 and 30 percent, which implies a steady-state unemployment rate 2.5/(2.5+30) = 7.7 percent. Compound crises are associated with a 1.7 percentage point rise in the separation rate and an 11.2 percentage point decline in the job-finding rate. An immediate, sustained increase in the separation rate by 1.7 percentage points implies a 12.1 percent unemployment rate after eight quarters, while an immediate, sustained decline in the job-finding rate of 11.2 percentage points implies an 11.1 percent unemployment rate after eight quarters. These calculations suggest that each force accounts for a roughly equal share of the overall rise in the unemployment rate during compound crises. This finding is in line with the more recent consensus that the

[13]We focus on the classic flows between employment and unemployment. Similar results hold if we study instead flows between employment and non-employment, where the latter pools unemployment and inactivity. Recent research from developed countries proposes using flows between unemployment and inactivity or distinguishing between flows into and out of unemployment versus inactivity for additional insights (Elsby et al., 2015; Graves et al., 2024). However, these methods may not be as useful in developing countries, where unemployment and inactivity are less distinct labor market states (Donovan et al., 2023).

job-finding rate and separation rate both play an important role in generating cyclicality in the unemployment rate, both in the United States (Hall, 2005; Fujita and Ramey, 2009; Shimer, 2012) and across OECD countries (Elsby et al., 2013).

The ninth row shows that the job-to-job transition rate also falls during recessions and crises. This estimate shows that recessions involve a disruption of the job ladder. The disruption is no worse in crises or compound crises; they mainly involve large flows to non-employment.

Finally, the last two rows show the effects on mean log monthly earnings per employed and mean log hourly wage (earnings per hour worked). These estimates are only possible for 16 countries that collect continuous measures of monthly earnings. They cover relatively few crises and compound crises and so should be interpreted with some caution. The main preliminary finding is that wages and earnings both fall substantially, with earnings falling by slightly more, consistent with the decline in hours per employed. The fall in earnings and wages during crises and compound crises is not statistically different from the fall during recessions. This could reflect that the main effect of crises is through the extensive margin of employment rather than earnings per employed or per hour. This interpretation is consistent with the findings of Guvenen et al. (2014) that recessions are associated with an increased probability of large earnings losses, which may reflect the central role of unemployment risk.

This first set of results using the micro dataset shows that the deterioration of labor market outcomes during recessions is widespread. Compound crises are associated with an additional, statistically significant worsening of the unemployment rate, long-term unemployment rate, and employment-population ratio. In the Appendix, we present results from a version of Table 3 that also controls for the severity of the recession in terms of its GDP per capita decline (see Table B9). The extent of the decline in GDP per capita strongly correlates with the deterioration of most labor market outcomes, but we again find that there is an additional, statistically significant worsening of the unemployment rate, long-term unemployment rate, and employment-population ratio even after controlling for the decline in real GDP per capita. Finally, we examine the

behavior of cyclicality in countries with high and low levels of self-employment and find that they are broadly similar (Table B10).

4. Distributional Consequences of Crises

Our results so far show that crises are associated with severe and long-lasting labor market downturns. We now use the micro dataset to ask which workers experience the largest increases in unemployment during downturns. We build on a long tradition of research that studies heterogeneity in labor market outcomes (Altonji and Blank, 1999). More recent work has demonstrated that business cycles in the United States have systematically different effects on different types of workers (Cajner et al., 2017). We extend this analysis to show broad trends across a large number of countries and regions.

These results are informative about the welfare cost of business cycles. In models with uninsurable idiosyncratic risk, the consumption and welfare consequences of a given income shock depend on the household's insurance mechanisms, including notably self-insurance through savings. While labor force surveys do not collect data on assets, we can observe several useful proxies. We focus here on heterogeneity based on age, education, and initial earnings.

We start by investigating the heterogeneous responses by age. We divide people into three age groups: young (16–24 years old), middle-aged (25–54 years old), and older (55 years and older).[14] We compute the severity of the rise in the unemployment rate separately for each age group. We then regress the age-specific severity on whether a recession was a crisis or a compound crisis. The results are shown in the first three columns of Table 4. Again, the constant represents the rise in unemployment during a non-crisis recession. These estimates show that the young are much more affected by unemployment than middle-aged or older workers in our cross-country sample, consistent

[14] We focus on current age, which implies that the underlying workers in each age group are changing over time. von Wachter (2020) reviews the evidence on the persistent effect of entering the labor market during a recession. We explored controlling for entry-cohort effects alongside current age, but found them less important for explaining unemployment responses in our sample. We also explored gender differences and found them to be small.

with the U.S. experience. The estimates for a crisis or a compound crisis show that the additional increase in unemployment during these events is also larger for young workers. The cumulative effects are large: young workers experience a 16.5 percentage point increase in unemployment during compound crises.

Table 4: Unemployment response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	2.363	1.417	0.883	1.169	2.296*	1.422
	(1.771)	(1.148)	(0.864)	(1.496)	(1.278)	(0.983)
Compound crisis	11.577***	6.120***	6.694***	12.758***	9.688***	2.138**
	(3.062)	(1.877)	(1.814)	(3.220)	(2.320)	(1.004)
Constant	4.912***	3.010***	2.533***	4.296***	3.055***	2.431***
	(0.909)	(0.677)	(0.491)	(0.872)	(0.506)	(0.404)
R^2	0.315	0.256	0.288	0.375	0.418	0.107
N	72	72	70	71	72	71
Countries	35	35	34	35	35	35
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
The unemployment responses of middle-aged and old workers are statistically different from those of young workers in recessions (p-value: 0.002 and 0.001) and compound crises (p-value: <0.001 and 0.005), but not in crises (p-value: 0.375 and 0.258). The unemployment responses of college-educated workers and to a lesser extent high school graduates are statistically different from those of less-than-high-school-graduates in recessions (p-value: 0.004 and 0.030) and compound crises (p-value: 0.001 and 0.085), but not in crises (p-value: 0.818 and 0.198).
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We repeat this procedure for workers with three different education levels: workers with less than a high school degree, those with a high school degree, and those with at least some college. The results are shown in the last three columns of Table 4. Again we find that there are large differences across groups; in this case, workers with less than a high school degree face increases in unemployment that are much larger than those of workers with some college.

We expand on these results in a number of ways in Appendix B.10. We show the duration of the labor market downturn is broadly similar across age and education groups. We show results for a wide range of other labor market outcomes, including employment-population ratios, labor force participation rates, long-term unemployment, separation rates, and job-finding rates. They broadly support the conclusion that younger and less educated workers are more affected. We control for age and education simultaneously and show that each has an independent effect. Finally, we control for the severity of the recession in terms of the cumulative decline in real GDP per capita. These results show

that the labor market outcomes of younger and less educated workers are simultaneously more sensitive to the decline in real GDP per capita and more sensitive to whether a recession is a crisis or a compound crisis.

We also examine the incidence of unemployment by earnings level. Recall that in the micro dataset we track workers for two consecutive quarters. We only observe earnings for employed workers. We classify workers into (country-specific) earnings quintiles based on their earnings in their first period in the sample. Focusing on quintiles allows us to use data from more countries, including roughly one-third of the sample where we only observe earnings in bins. We study their transition to unemployment in the second quarter in the sample, which is mechanically equivalent to studying their separation rate by initial earnings quintile.[15] Table 5 reports the increase in separation rates by initial earnings quintile.

Table 5: Separation rate response to recessions and crises by earnings groups: severity

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Crisis	2.102	1.009	0.540	0.027	-0.558**
	(1.579)	(0.832)	(0.832)	(0.513)	(0.263)
Compound crisis	0.993	1.364	0.674	0.493	-0.683***
	(1.390)	(0.986)	(0.461)	(0.637)	(0.228)
Constant	1.613**	0.989	0.834*	1.047***	1.114***
	(0.653)	(0.650)	(0.461)	(0.287)	(0.226)
R^2	0.055	0.032	0.012	0.003	0.051
N	47	47	48	48	49
Countries	24	24	24	24	24
Country FE	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results are also consistent with the view that marginal workers are more affected by recessions and severe labor market downturns. The constant term shows the rise in the separation rate for each earnings quintile during a non-crisis recession, while the indicators for crisis and compound crisis show the marginal effects for each earnings quintile. Workers in lower earnings quintiles experience larger rises in separation rates in recessions, crises, and compound crises. For example, workers in the bottom earnings quintile have a 2.6 percentage point rise in separation rates during a compound crisis,

[15] This data limitation also prevents us from studying other potentially relevant statistics of interest, such as long-term unemployment rates by initial earnings quintile.

whereas those in the top earnings quintile have only a 0.4 percentage point rise. However, the difference between quintiles 1 and 5 is statistically significant only for crises and only at the 10 percent level; the remaining differences are not distinguishable even at that threshold.

The uncertainty surrounding these estimates notwithstanding, the results suggest that more marginal (younger, less educated, and lower-earning) workers are more affected by recessions, crises, and compound crises than their peers. These patterns provide empirical guidance for heterogeneous-agent models in which the distribution of income losses across households shapes both welfare costs and aggregate consumption responses (Krueger et al., 2016; Kaplan et al., 2018). To the extent that the most exposed workers have limited liquid savings or access to other insurance, concentrating employment losses among them can raise the welfare cost and amplify the consumption decline associated with a given aggregate income loss. Our estimates provide moments for disciplining how employment risk varies across worker types and downturns in these models.

There is one result that cuts the other way. In Appendix B.10 we show that the wage losses for younger and less-educated workers are much smaller than for their older and more-educated peers. This gap is particularly large during recessions and partially reverses during crises and compound crises. However, the interpretation of this finding is not clear. Given the large differences in unemployment rates between these groups, this gap could reflect stronger selection in the set of younger and less educated workers who remain employed. On the other hand, it could reflect a difference in exposure whereby younger and less educated workers are exposed to crises on the extensive margin and their older and more educated peers are more exposed on the intensive margin. Additional data would be needed to distinguish between these two hypotheses.

5. Interactions and Connections to Theory

We now connect our results to existing theories about the underlying mechanisms for severe labor market downturns. We test these mechanisms and study their implications for different types of workers.

Table 6: Sectoral Transmission of Crises: Employment-Population: Severity

	All sectors	Manufacturing	Construction
Crisis	-2.618	-0.587*	-0.277
	(2.133)	(0.332)	(0.387)
Compound crisis	-4.553***	-1.517***	-2.148***
	(1.556)	(0.392)	(0.749)
Constant	-2.902***	-0.742***	-0.619**
	(0.587)	(0.126)	(0.253)
R^2	0.095	0.234	0.232
N	67	67	67
Countries	30	30	30
Country FE	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.1. Sectoral Dimensions of Crises

A persistent question is which sectors play the most important role in propagating crises through the economy. Quantitative models of crises variously emphasize the importance of construction, tradables, and finance-dependent sectors, among other possibilities (Kónya and Váry, 2024; Calvo et al., 2004; Mendoza, 2010; Kroszner et al., 2007). Our data are well-suited to providing a broad characterization of propagation through labor markets. We harmonize the original industry codes in the micro data to 15 broad industry groups.[16] We focus our attention on changes in the ratio of sectoral employment to population. This statistic is useful because the aggregate employment-population ratio is simply the sum across sectors of the sectoral employment-population ratio. Thus, it allows us to ask which sectors drive the decline in aggregate employment.

The first column of Table 6 repeats the results for the change in the aggregate employment-population ratio. We compute the change in the sectoral employment-population ratio for each sector over the same time period that we use at the aggregate. Holding the time period fixed implies that the changes in sectoral employment-population ratios sum to the change in the aggregate employment-population ratio.

The last two columns of Table 6 show the results for two key sectors: manufacturing and construction. These sectors account for a disproportionate share of the employment

[16]We build on the work of Ruggles et al. (2025), using the same classification as they do in their variable indgen. When possible, we also use their crosswalks from original country industry codes to broad industry groups.

loss during recessions and crises and particularly during compound crises. For example, they account for 47 percent of the employment loss during a recession and 67 percent during compound crises. These figures are large relative to their baseline employment share, which averages 23 percent (15 percent for manufacturing and 8 percent for construction).

We provide additional results to help understand these findings in Appendix B.11. For example, we show that the other thirteen sectors have smaller changes in employment-population ratios that are rarely statistically significant. We also show results for log sectoral employment, which does not weight sectors by their initial size. Overall, manufacturing and construction stand out for having large employment losses during recessions and crises by both metrics. This suggests to us that these two sectors are important for business cycle propagation in labor markets, particularly during crises and compound crises.

5.2. Exchange Rate Policy

A long literature points to exchange rate policy as an important determinant of the severity and duration of a recession. We investigate the implications for the extent of the subsequent labor market downturn.

Throughout, we categorize each country's exchange rate policies following Reinhart and Rogoff (2004), Ilzetzki et al. (2019), and Ilzetzki et al. (2022). They divide each country-year into one of six exchange rate arrangements. To ensure sufficient sample size for comparison, we aggregate these into two groups that approximate the classic fixed and floating exchange rate regimes.[17] We estimate the severity and duration of a labor market downturn as a function of whether it was a crisis or a compound crisis interacted with whether the country had a fixed exchange rate.

Our results are shown in Table 7. Columns (1) and (3) repeat the results without any control for exchange rate policy for reference; these results are equivalent to columns (2) and (5) of Table 2. Columns (2) and (4) show the corresponding results when we control for whether a country has a fixed exchange rate at the onset of the recession

[17]Fixed includes peg and crawling peg; floating includes managed float, free float, and free fall, in their terminology.

Table 7: Unemployment Response to Recessions: Exchange Rate Policy

	Severity		Duration	
	(1)	(2)	(3)	(4)
Crisis	1.362**	1.255*	0.941	-0.254
	(0.562)	(0.652)	(0.836)	(1.484)
Compound crisis	4.622***	1.330	4.851***	1.753
	(1.233)	(0.844)	(1.446)	(1.491)
Fixed exchange rate		-1.572***		-1.766
		(0.553)		(1.164)
Fixed exchange rate × Crisis		1.035		2.422
		(1.026)		(2.121)
Fixed exchange rate × Compound crisis		7.098***		6.229**
		(1.972)		(2.769)
Constant	0.420***	1.993***	3.000***	4.766***
	(0.000)	(0.553)	(0.000)	(1.164)
R^2	0.498	0.638	0.358	0.381
N	298	273	298	273
Countries	84	81	84	81
Country FE	Yes	Yes	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

and interactions between having a fixed exchange rate and whether the recession was a crisis or a compound crisis. In this case, the constant and the coefficients on crisis and compound crisis capture the baseline effect for the omitted category, which is countries with a flexible exchange rate; the interactions capture the marginal effect for having a fixed exchange rate instead.

The literature has shown that fixed exchange rates are associated with more severe crises in terms of output (Eichengreen and Sachs, 1985; Domaç and Martinez Peria, 2003). We find the same is true for the severity of the labor market downturn. Our dataset covers 31 compound crises; we are able to categorize the exchange rate regime for 28 of them.[18] Of these, 14 have fixed and 14 have flexible exchange rates. Countries with a fixed exchange rate that experience a compound crisis have 5.5 percentage point larger rises in unemployment and downturns that last 4.5 quarters longer than countries with flexible exchange rates. Indeed, the coefficients on compound crisis are both positive but smaller and no longer statistically significant, indicating that much of the severity associated with compound crises comes from countries with fixed exchange rates.

The literature has proposed several mechanisms for why fixed exchange rate regimes are associated with severe downturns. Obstfeld and Rogoff (1995) and Kaminsky and

[18]The exchange rate database only covers through 2019; later compound crises are dropped because we do not have consistent data on the exchange rate regime.

Reinhart (1999) document that countries engage in costly actions in an attempt to defend their fixed exchange rate. Schmitt-Grohé and Uribe (2016) propose that fixed exchange rates interact with free capital mobility and lead to overborrowing during booms and higher levels of unemployment during recessions. As suggestive evidence, we note that among the 14 episodes where a country has a fixed exchange rate and experiences a compound crisis, only one abandoned the fixed exchange rate for a flexible regime within two years and only one entered the recession with a current account surplus.[19] While we would like to compare the severity and duration of crises for countries that maintain versus abandon a fixed exchange rate, or for those that enter the crisis with a current account deficit versus a surplus, we lack the sample size to do so.

These macro shocks also have important distributional consequences, tying back to the results in Section 4. To show this, we return to the micro dataset and estimate the rise in unemployment by age and education group as a function of whether a recession is a crisis or a compound crisis, but also including interactions with whether the country had a fixed exchange rate. Our estimates rely on twelve countries that experience compound crises during and shortly after the Great Recession – seven with fixed exchange rates and five with flexible exchange rates. The results, shown in Appendix B.11, show a strong gradient as before. Young and less educated workers generally face larger rises in unemployment rates during crises and particularly during compound crises. For example, consider the extreme case of a country with a fixed exchange rate that experiences a compound crisis. During these events, young workers with less than a high school degree experience a 30.7 percentage point rise in unemployment rates, while older, college-educated workers experience an increase of 6.8 percentage points.

5.3. Inflation and Crises

Finally, we turn to the role of inflation and currency devaluations. The role of these two policies is typically tied to the importance of nominal wage rigidities. The intuition is that recessions and particularly crises are times of declines in labor demand. If wages

[19] We collect data on the current account from Lane and Milesi-Ferretti (2018) and Milesi-Ferretti (2022).

cannot fall, or do not fall quickly enough, workers experience unemployment. Devaluations or rising inflation can offset this friction, leading to lower real wages but a smaller rise in unemployment (Calvo et al., 2025; Blanco et al., 2025). Calvo et al. (2025) coin the terminology of jobless versus wageless recoveries. We use our data to test for evidence of such a bifurcation.

Table 8: Unemployment Response to Recessions: The Role of Inflation and Depreciation

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis	1.362**	1.244**	1.583**	0.941	0.866	1.079
	(0.562)	(0.575)	(0.647)	(0.836)	(0.894)	(1.061)
Compound crisis	4.622***	5.379***	6.263***	4.851***	5.919***	5.260***
	(1.233)	(1.494)	(1.410)	(1.446)	(1.956)	(1.968)
Large depreciation		0.288			1.535*	
		(0.478)			(0.892)	
Large depreciation × Crisis		1.785			3.054	
		(1.292)			(2.352)	
Large depreciation × Compound crisis		-2.380			-3.590	
		(2.054)			(2.644)	
Δ PPI infl. > 9.8pp (90th pct)			-0.653			-2.700**
			(0.545)			(1.111)
Δ PPI infl. > 9.8pp (90th pct) × Crisis			-0.821			-0.826
			(0.731)			(1.572)
Δ PPI infl. > 9.8pp (90th pct) × Compound crisis			-2.587			0.234
			(2.007)			(2.820)
Constant	0.420***	0.420***	0.420***	3.000***	3.000***	3.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.498	0.513	0.529	0.358	0.377	0.403
N	298	298	298	298	298	298
Countries	84	84	84	84	84	84
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

PPI is producer price index.
Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To do so we collect data on countries that experience large depreciations or large bouts of inflation. We take data on the former from the Global Crises Data by Country (GCDC) database.[20] We use what they call currency crises – countries that experience depreciations or devaluations of more than 15 percent in a year. We follow Calvo et al. (2014) and use data on producer price inflation for the latter, which we take from Ha et al. (2023). In this case, we define a burst of inflation as a country-quarter in which the four-quarter change in producer price inflation exceeds the 90th percentile of the overall distribution of such changes, which corresponds to an increase of more than 9.8 percentage points.

[20]This database builds on the work of Carmen Reinhart and co-authors (e.g., Reinhart and Rogoff, 2009). Downloaded from https://www.hbs.edu/behavioral-finance-and-financial-stability/data/Pages/global.aspx on September 8, 2021.

We then interact the severity and duration of each labor market downturn with the same constant, crisis indicator, and compound crisis indicator, as well as interactions with whether the downturn had either a large depreciation or high inflation. Table 8 shows the results.

Columns (1) and (4) again repeat the baseline results, for reference. Columns (2) and (5) show the results of including interactions with the indicator for large depreciations, while columns (3) and (6) show the results of including interactions with the indicator for high inflation. The estimated effects for depreciation events during compound crises are negative but imprecisely estimated. The estimated effects for inflation during recessions are negative, with the effect for duration reaching statistical significance. The interactions with the crisis and compound crisis indicators are imprecisely estimated. Appendix B.11 shows similar results for consumer price indices instead of producer price indices and for various thresholds for categorizing "high" inflation; the basic insight of a negative effect for recessions that is sometimes statistically significant carries over. Across thresholds, the crisis and compound-crisis interactions vary in sign and are generally imprecisely estimated. The estimates are consistent with a jobless-versus-wageless recovery tradeoff, but we find no evidence that the tradeoff is stronger during crises or compound crises.

We estimate results for the severity of the crisis for workers of different age and education levels and interactions with large depreciations or bursts of inflation in Appendix B.11. The depreciation estimates exhibit a clear distributional gradient: large depreciations during compound crises are associated with substantially smaller unemployment increases among younger and less-educated workers. The corresponding inflation estimates are smaller, imprecisely estimated, and do not exhibit a consistent demographic gradient. For example, a large depreciation during a compound crisis is associated with a 17.2 percentage point smaller rise in unemployment for young workers with less than a high school degree, and a burst of inflation with a 2.5 percentage point smaller rise for the same group. By contrast, for older, college-educated workers, depreciation is associated with a 2.8 percentage point smaller rise, whereas a burst of inflation is associated with a 1.3 percentage point larger rise. Once again, the main take-away is that recessions

and some policies have heterogeneous effects on different types of workers, with marginal workers being most exposed to the worst labor market downturns.

6. Conclusion

Macroeconomic crises are fortunately rare, but they have important implications for financial markets and for the implied welfare costs of business cycles. In this paper we use the fact that a large number of countries worldwide have now collected quarterly labor force surveys for a sufficiently long period to characterize how labor markets respond to recessions and crises. We use the aggregate unemployment rate that they report from such surveys as well as the underlying microdata to provide results that have both breadth and depth.

Applying the harmonized data to a broad sample of recessions establishes the generality of several patterns documented previously in individual countries or crises. First, the distribution of labor market downturns is right-skewed, with a long tail of significant downturns, similar to the distribution of consumption or output per capita declines. Second, the most severe events are closely associated with a few important types of crises, notably banking panics, house price busts, and sudden stops. Third, recessions and crises fall hardest on marginal workers – younger workers, less-educated workers, and lower-earning workers. Fourth, we find that a number of policies and mechanisms proposed by the literature are correlated with the severity and duration of a labor market downturn. We also examine their distributional incidence and find that the largest effects generally fall on younger and less-educated workers.

Our work brings together two literatures that argue separately for larger welfare costs of cycles – the literature on rare crises and the literature on uninsurable idiosyncratic income risk. It also provides new insights on the propagation and costs of financial crises, house price busts, and sudden stops. These insights have implications for both how to model these shocks as well as the welfare gains from regulatory or prudential policies that seek to mitigate them. Finally, our results strengthen the importance of existing research that studies the importance of macroeconomic policies for the severity of a recession. We show that these policies also affect the labor market and particularly affect the most

marginal workers in the labor market. These are exciting avenues for future work.

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Supplementary Appendix

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Appendix A. Data Details

This appendix provides details on the source and coverage of our two datasets and our measures of crises.

Appendix A.1. Coverage by Country

Our aggregate dataset consists of published data on the quarterly unemployment rate and quarterly real GDP per capita for all countries for which we can find the data that span at least five years. Our basic procedure is to collect data on the unemployment rate and real GDP or real GDP growth rate directly from the major sources that aggregate such statistics:

- Seasonally adjusted real GDP growth rates and unemployment rates from Organization for Economic Co-operation and Development (2025) series "Quarterly real GDP growth - OECD countries" and "Monthly unemployment rates."
- Seasonally adjusted real GDP and unemployment rates from Eurostat (2025a) and Eurostat (2025b), series NAMQ_10_GDP and UNE_RT_Q;
- Seasonally adjusted and (for some countries) unadjusted unemployment rates from International Labour Organization (2025), series UNE_DEA1_SEX_AGE_RT_Q and UNE_DEAP_SEX_AGE_RT_Q;
- Seasonally adjusted and (for some countries) unadjusted quarterly real GDP data from International Monetary Fund (2025), series NGDP_R_SA_XDC and NGDP_R_NSA_XD

We augment these series with similar data from national statistical offices when they are available. This allows us to add or extend the unemployment series for seven countries and the GDP data for fourteen countries.

We convert all GDP data to quarterly growth rates. We use seasonally adjusted GDP growth rate and unemployment rate series whenever they are available. If only an unadjusted series is available, then we manually adjust it. For unemployment rates, we estimate the log unemployment rate as a function of quarter fixed effects for each country and use the regression to remove the proportional effect, as in Donovan et al.

(2023). Seasonal effects for GDP growth are much more pronounced and the adjustment much more important. We find taking the implied quarterly growth rate from the year-over-year change in real GDP gives the best performance because it works well for shorter samples as we have in some countries but also allows for flexibility to fit countries whose seasonal cycles are changing over time. We merge on population growth rate data from World Bank (2025) and use it to convert real GDP growth rates to real GDP per capita growth rates under the assumption that population growth is constant across quarters within each country-year.

Table A1 gives the overview of our aggregate dataset. It lists the countries covered; the time period covered for each country; and the number of recessions.

Our micro dataset uses instead micro data from rotating panel labor force surveys. This uses an updated version of the database from Donovan et al. (2023). We use the same sources and procedures to merge on quarterly real GDP per capita as we did with the aggregate dataset. Table A2 describes the dataset. It lists the countries covered; the time period covered for each country; the number of observations (people matched for two consecutive quarters) in thousands; and the number of recessions.

Table A1: Coverage of Aggregate Dataset

Country	Quarters	Recessions
Albania	2012q1–2023q4	1
Argentina	2003q3–2024q3	7
Armenia	2008q1–2024q4	2
Australia	1966q3–2024q4	7
Austria	1993q1–2025q1	4
Belgium	1983q1–2025q1	3
Belize	2012q2–2024q3	5
Bolivia	2015q4–2024q2	1
Brazil	1996q1–2024q4	6
Bulgaria	2000q1–2024q4	2
Canada	1961q1–2025q1	9
Chile	1996q1–2025q1	5
Colombia	2001q3–2024q4	3
Costa Rica	2010q3–2025q1	2
Croatia	2000q1–2025q1	2
Cyprus	1999q2–2024q4	3
Czech Republic	1994q1–2025q1	5
Denmark	1983q1–2025q1	6
Dominican Republic	2000q2–2024q4	3
Ecuador	2003q4–2024q4	6
Egypt	2008q1–2023q4	2
Estonia	1997q1–2025q1	4
Finland	1988q1–2025q1	5
France	1983q1–2025q1	3
Georgia	2018q1–2025q2	1
Germany	1983q2–2025q1	6
Greece	1987q2–2025q1	8
Guatemala	2013q4–2021q4	1
Hong Kong	1985q1–2024q4	9
Hungary	1996q1–2025q1	6
Iceland	1995q2–2025q1	5
India	2017q3–2024q4	1
Indonesia	2008q1–2023q3	1
Iran	2006q1–2023q4	6
Ireland	1995q1–2025q1	3
Israel	1995q1–2025q1	4
Italy	1983q1–2025q1	4
Jamaica	2008q1–2024q1	3
Japan	1960q1–2024q4	6
Jordan	2007q1–2024q1	3
Korea	1990q1–2025q1	2
Kosovo	2012q1–2021q4	1
Latvia	1998q2–2025q1	2
Lithuania	1998q2–2025q1	3
Luxembourg	1983q1–2025q1	9
Macao	2001q4–2021q1	4
Malta	2000q2–2024q4	6
Mauritius	2001q1–2023q4	3
Mexico	1987q1–2025q1	9
Mongolia	2010q1–2024q4	2
Montenegro	2011q1–2023q4	2
Netherlands	1983q1–2025q1	4
New Zealand	1987q2–2024q4	8
North Macedonia	2005q1–2024q4	1
Norway	1989q1–2025q1	4
Pakistan	2017q3–2021q2	0
Paraguay	2010q1–2024q4	4
Peru	2007q4–2024q3	2
Philippines	2001q1–2023q1	1
Poland	1997q1–2025q1	2
Portugal	1983q1–2025q1	6
Republic of Moldova	2010q1–2024q3	2
Romania	1997q2–2024q4	3
Russia	2010q1–2023q4	3
Rwanda	2017q1–2024q4	1
Saint Lucia	2011q3–2023q1	5
Saudi Arabia	2015q2–2024q4	3
Senegal	2016q2–2024q2	3
Serbia	2008q2–2024q4	3
Seychelles	2016q1–2024q2	1
Singapore	1992q1–2024q4	6
Slovak Republic	1998q1–2025q1	1
Slovenia	1996q1–2025q1	3
South Africa	2000q1–2024q4	4
Spain	1986q2–2025q1	3
Sri Lanka	2010q4–2022q4	3
Sweden	1983q1–2025q1	3
Switzerland	1996q2–2025q1	3
Taiwan	1982q1–2021q1	1
Thailand	2010q1–2024q1	1
Trinidad and Tobago	2012q4–2023q4	3
Turkey	2005q1–2025q1	3
Ukraine	2010q1–2021q4	2
United Kingdom	1971q1–2025q1	7
United States	1948q1–2025q1	10
Uruguay	1998q1–2024q2	2
Viet Nam	2011q1–2024q4	1
West Bank and Gaza	2011q4–2024q4	5
Total: 88 countries	9,131 quarters	323 recessions

Quarters gives the range over which aggregate unemployment rate data are available for each country. Data may not be available for some quarters within the range. Recessions is the number of recessions the country has experienced during the period covered.

Table A2: Coverage of Micro Dataset

Country	Quarters	Observations (1000s)	Recessions
Argentina	2003q3–2025q2	1088	7
Austria	2010q1–2020q3	743	2
Bolivia	2015q4–2025q2	721	1
Brazil	2002q1–2025q2	10392	4
Chile	1986q1–2025q2	6950	5
Costa Rica	2010q3–2024q4	315	2
Croatia	2010q1–2020q3	89	1
Cyprus	2005q1–2020q3	261	3
Czech Republic	2005q1–2010q3	591	1
Denmark	2007q1–2020q3	306	2
Dominican Republic	2016q1–2023q4	281	1
Ecuador	2007q2–2025q2	491	5
Estonia	2005q1–2020q3	90	2
France	2003q1–2017q3	2381	1
Georgia	2009q1–2024q3	134	1
Greece	2005q1–2018q3	1434	2
Hungary	2005q1–2020q3	1640	4
India	2017q3–2025q2	2641	1
Ireland	2007q1–2016q3	705	1
Italy	2005q1–2020q3	2019	3
Jamaica	2016q2–2021q3	49	1
Latvia	2007q1–2016q3	78	1
Lithuania	2005q1–2020q3	227	2
Malta	2009q1–2020q3	59	3
Mauritius	2011q1–2023q3	126	1
Mexico	1995q1–2025q2	21403	5
Mongolia	2019q1–2024q3	59	1
Paraguay	2010q1–2017q2	45	1
Peru	2003q1–2018q3	208	0
Philippines	1988q2–2003q1	1383	2
Poland	2010q1–2020q3	878	1
Portugal	2010q1–2020q3	544	2
Romania	2005q1–2020q3	929	2
Slovak Republic	2005q1–2020q3	639	1
Slovenia	2014q1–2020q3	116	1
South Africa	2011q1–2017q1	121	1
Spain	2000q1–2019q4	7051	2
Sweden	2006q1–2020q3	1631	2
Switzerland	2010q1–2019q3	289	0
United Kingdom	1997q1–2025q2	4185	3
United States	1976q1–2025q2	8213	5
West Bank and Gaza	2000q1–2025q2	446	5
Total: 42 countries	2,582 quarters	81,339 observations	91 recessions

Quarters gives the range over which matched labor force survey microdata are available for each country. Data may not be available for some quarters within the range. Observations is the number of people matched for two consecutive quarters, expressed in thousands. Recessions is the number of recessions the country has experienced during the period covered.

Appendix B. Additional Results

This appendix provides additional results described or referred to in the text.

Appendix B.1. Defining the Severity and Duration of a Labor Market Downturn

In most cases it is straightforward to date the trough of a labor market downturn, which in turn makes it straightforward to measure both the severity and duration of the labor market downturn. In a typical downturn, the unemployment rate rises from the onset of the recession, reaches a local maximum, and then steadily declines. For such cases, we define the trough of the labor market downturn as the first date that satisfies two criteria: i) the unemployment rate is higher than the quarter before and after; ii) the unemployment rate is higher than any of the four following quarters. The former criterion picks out local maxima, while the latter ensures that the recovery is steady and not the effect of one particularly bad quarter. We then define the severity of the labor market downturn as the change in the unemployment rate between the onset of the recession and the trough of the downturn and the duration of the labor market downturn as the number of quarters between the onset of the recession and the trough of the downturn.

In some cases the unemployment rate remains flat or even falls from the start of a recession. In such cases, we look for any labor market troughs over the next ten years of data. If there are any, and if the unemployment rate at the first such trough is higher than the unemployment rate at the onset of the recession, then we use this date as the trough of the labor market downturn and calculate the severity and duration accordingly. If we find no troughs, or if the next trough has a lower unemployment rate, then we set the duration to 1 quarter and the severity to the change in the unemployment rate over that first quarter from the onset of the recession.

We compute a separate severity and duration for other labor market variables. In such cases, we follow the algorithm above variable by variable. The only change is that a deterioration of the unemployment rate corresponds to it rising, whereas for some other variables such as the employment-population ratio or labor force participation rate it corresponds to the variable falling. We simply flip the signs of the tests that we impose in such cases.

Our definition of the duration captures the period until a recovery begins. A natural alternative would be to study how long it takes until the recovery is complete, meaning that the labor market has returned to a long-run average or its pre-recession level. A challenge with such an analysis is that it runs the risk of inducing an important censoring bias. Countries that experience a severe labor market downturn may not experience a full recovery by this definition during the period for which we have data, which would bias our estimates.

As a compromise, we investigate how long it takes countries to complete a partial recovery halfway from the unemployment rate at the trough back to the pre-recession level. For example, if a country had a 5 percent unemployment rate before the crisis and a 9 percent unemployment rate at the trough, we define the duration as the period until the country achieves 7 percent unemployment. This has only a modest degree of censoring: we drop 9 recessions, 5 crises, and 3 compound crises that do not achieve a partial recovery during our period of data availability.

Table B1: Unemployment response to recessions: alternative definition of duration

	Duration to Peak Unemployment			Duration to Partial Recovery		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis	1.134*	0.941	0.419	2.556*	2.448	2.086
	(0.633)	(0.836)	(0.739)	(1.379)	(1.883)	(1.757)
Compound crisis	5.709***	4.851***	2.343*	11.749***	10.967***	7.649***
	(1.081)	(1.446)	(1.250)	(2.000)	(2.678)	(2.631)
Duration, GDP			0.606***			0.950***
			(0.109)			(0.249)
Constant	5.691***	3.000***	1.183***	9.844***	4.000***	1.150
	(0.314)	(0.000)	(0.328)	(0.615)	(0.000)	(0.747)
R^2	0.114	0.358	0.461	0.127	0.390	0.457
N	298	298	298	281	281	280
Countries	84	84	84	84	84	84
Country FE	No	Yes	Yes	No	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Onset of recovery is the baseline measure of duration, quarters until the trough of the downturn. Partial recovery instead measures duration as quarters until a 50 percent recovery in the unemployment rate to pre-recession levels.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B1 shows the resulting estimates. Columns (1)–(3) show our baseline measure of duration, which is the time until the recovery starts. Columns (4)–(6) show the corresponding estimates for the partial recovery. Comparing the results from column (4) to column (1) shows that it generally takes a year to proceed from the onset of a recovery

to a 50 percent recovery. The same period is even longer in the case of a crisis or a compound crisis; in the latter case, it takes 10.2 quarters. Columns (5) and (6) confirm that the duration of a partial recovery is not accounted for by country fixed effects and that the partial recovery from a compound crisis is longer than one would predict from the length of the recession itself.

Appendix B.2. Sources for Alternative Crises

In the text we focus on three main types of crises: banking panics, sudden stops, and house price busts. In the appendix we describe results for a number of other possible crises that we found to be less important. We start by describing the sources for these crises.

We also explore bank equity crises; like banking panics, we take these from Baron et al. (2021). We study sovereign debt crises, which we source from Laeven and Valencia (2013). We study currency crises – large devaluation events – using the data from the Global Crises Data by Country (GCDC) database.[21] Laeven and Valencia (2013) also provide data on currency crises, but they indicate many fewer events, too few to allow even a preliminary analysis with our labor market data. We study stock market crashes, which we also source from the GCDC database. They define these events following Barro and Ursúa (2017) as "cumulated multi-year real returns of -25 percent or less."

We estimate the effect of both adverse import and export commodity price swings. We use data from Gruss and Kebhaj (2019). Their data provide the monthly average price of each country's imports and exports of 45 commodities weighted by the country's imports and exports of each commodity and then scaled relative to total GDP. We define an adverse commodity price shock as occurring when the 4-quarter log change in the import price index is above the 95th percentile of the overall distribution (0.03 log points) or when the change in the export price index is below the 5th percentile of the overall distribution (-0.05 log points). Finally, we estimate the effect of COVID-19, which we consider to include any recession that starts in late 2019 through the first half of 2020.

[21] This database builds on the work of Carmen Reinhart and co-authors (e.g., Reinhart and Rogoff, 2009). Downloaded from https://www.hbs.edu/behavioral-finance-and-financial-stability/data/Pages/global.aspx on September 8, 2021.

Most of these sources provide us the incidence of each type of crisis at the country-year level. In these cases, we say that a recession is accompanied by a crisis if the crisis happens the year before, during, or after the onset of the recession. For cases where we can measure the incidence at the quarterly level, we say that a recession is accompanied by a crisis if the crisis happens anytime in the period from four quarters before the onset of the recession through eight quarters after it. The exception is commodity price shocks, which transmit to commodity markets almost immediately; for these we say that a recession is accompanied by a shock if it occurs anytime from two quarters before the onset of the recession through one quarter after it.

Appendix B.3. Results for Specific Types of Crises

With these definitions in hand, we now turn to results for the specific types of crises. Table B2 shows the number of each type of crisis that is covered by our aggregate dataset. It also shows the subset of those crises that are associated with recessions, and then the further subset that are also covered by our micro dataset.

Table B2: Crises, Recessions, and Data Coverage

	Aggregate data set		Micro data set
	Events	Recessions	Recessions
Bank panics	40	32	10
Bank equity crises	40	29	10
Stock market crashes	145	76	27
House price busts	53	38	9
Sudden stops	115	82	27
Commodity import price shocks	200	13	5
Commodity export price shocks	69	22	6
Large depreciations	86	42	13
Sovereign debt defaults	10	8	3

Events gives number of times each type of crisis occurs in a country during the period of data coverage as listed in Tables A1–A2. Recessions gives the number of events that are associated with a recession in the aggregate dataset and the subset also covered in the micro dataset.

There are two main lessons from this table. First, the different types of events vary widely in terms of how frequently they are connected with recessions. Most bank panics, house price busts, and sudden stops are accompanied by recessions, but only half of stock market crashes or currency crises are; the share for commodity price shocks is even lower. This is the first evidence in support of our decision to focus on bank panics, house price

busts, and sudden stops in the text.

We then use our aggregate dataset to estimate the severity and duration of each recession as a function of whether it is affected by each of the types of shocks listed in Table B2. This provides results similar to Table 2 in the main text, except that we differentiate each type of shock separately (and control for the presence of all other shocks) rather than grouping all events into crisis and compound crisis. The results are shown in Table B3.

Table B3: Unemployment Response to Recessions: Detailed Shocks

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Bank panic	1.712	2.414*	1.795*	0.988	1.280	0.103
	(1.099)	(1.347)	(0.947)	(1.412)	(2.062)	(1.879)
Bank equity crisis	0.131	-0.027	0.041	1.133	-1.067	-0.344
	(1.043)	(1.276)	(1.024)	(1.464)	(2.377)	(2.134)
Stock market crash	0.005	0.290	0.118	1.247	1.479	0.792
	(0.427)	(0.672)	(0.533)	(0.932)	(1.473)	(1.325)
House price bust	1.963**	1.957**	1.729**	4.128***	3.099*	2.224
	(0.763)	(0.882)	(0.759)	(1.215)	(1.720)	(1.671)
Sudden stop	1.113**	1.428*	1.018	0.352	0.325	-0.098
	(0.544)	(0.731)	(0.631)	(0.645)	(0.987)	(0.849)
Commodity import price shock	1.513	0.677	0.785	0.674	0.701	1.162
	(1.367)	(1.213)	(1.077)	(1.942)	(1.753)	(1.596)
Commodity export price shock	-0.357	0.548	0.282	-1.749*	0.372	0.266
	(0.877)	(0.945)	(0.742)	(0.891)	(1.407)	(1.472)
Large depreciation	-0.032	-0.026	0.280	-0.540	-0.466	-0.380
	(0.437)	(0.578)	(0.479)	(0.767)	(0.824)	(0.818)
Sovereign debt default	0.103	-0.495	-0.076	0.537	0.284	-1.449
	(1.080)	(0.825)	(0.643)	(1.241)	(1.508)	(1.936)
COVID-19	0.112	-0.103	-1.120**	-2.573***	-3.572***	-2.761***
	(0.345)	(0.557)	(0.558)	(0.424)	(0.775)	(0.819)
Severity, GDP			0.185***			
			(0.051)			
Duration, GDP						0.484***
						(0.117)
Constant	1.992***	0.524	-0.345	6.242***	6.572***	4.308***
	(0.249)	(0.557)	(0.654)	(0.430)	(0.775)	(1.039)
R^2	0.142	0.495	0.583	0.237	0.461	0.517
N	298	298	298	298	298	298
Countries	84	84	84	84	84	84
Country FE	No	Yes	Yes	No	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Banking panics, sudden stops, and house price busts stand out for having economically significant, positive shocks, and for the fact that they contain the only statistically significant effects (for bank panics and sudden stops, on severity in some specifications;

for house price busts, on severity in all specifications as well as on duration in some specifications). This is the second reason we focus on these shocks in the text.

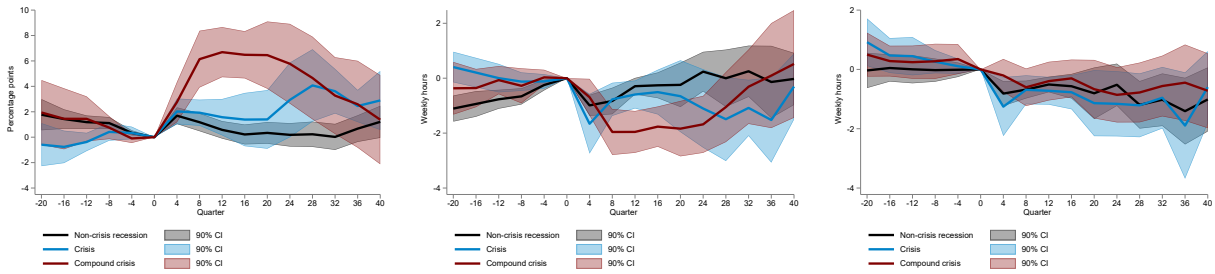
Some of the other estimates deserve further comment. Baron et al. (2021) find that bank equity declines are associated with contractions in lending and output, even when they are not associated with banking panics. However, we find that they have a relatively small effect on the labor market downturn, which means that the downturn looks like one associated with a non-shock recession. Stock market crashes, commodity shocks, and currency crises also all have smaller and less consistently significant effects on labor market downturns. Finally, COVID-19 is a clear outlier in that it is mainly associated with a large, statistically significant negative effect on duration: labor market downturns during COVID-19 were 2–4 quarters shorter than usual. We return to this finding further below in Appendix B.6.

Appendix B.4. Pre-Crisis Trends

Our main results focus on the severity and the duration of the labor market downturn, both measured from the onset of the recession. This naturally raises the question of whether there are important pre-crisis trends. To study this, we use local projections to estimate the entire time path of unemployment, hours per adult, and hours per employed for a recession, crisis, and compound crisis in the micro database for each quarter from t = -20 (five years before) to t = 40 (ten years after). Figure B1 shows the results.

Figure B1: Pre-Crisis Dynamics

(a) Unemployment (b) Hours per Adult (c) Hours per Employed



In the years leading up to a non-crisis recession the unemployment rate falls by about 2 percentage points and the hours per adult rise by about an hour per week. The hours per employed are essentially flat. The results for crises and compound crises are economically and statistically similar, with the largest difference being that hours per adult do not rise much leading into the crisis. Overall we see little evidence that crises reflect a correction of pre-shock booms in the labor market.

Appendix B.5. Great Recession

The set of countries that collect quarterly labor force data – particularly rotating panel quarterly labor force data – has expanded greatly in the last few decades. This implies that the coverage of our aggregate and micro datasets is heavily weighted towards recent decades. Because of this, the Great Recession plays a large role in our analysis, particularly when estimating responses to crises and compound crises. In this appendix, we show that we find a significant effect of crises even when studying the Great Recession separately.

Table B4: Unemployment Response to Recessions and the Great Recession

	Severity		Duration	
	(1)	(2)	(3)	(4)
Great Recession	1.988**	0.823	2.683**	1.192
	(0.826)	(0.758)	(1.078)	(1.033)
Bank panic		2.037		1.793
		(1.489)		(2.059)
Bank equity crisis		0.187		0.118
		(1.298)		(2.329)
House price bust		2.269***		4.215***
		(0.845)		(1.483)
Constant	0.420***	0.420***	3.000***	3.000***
	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.397	0.467	0.331	0.387
N	298	298	298	298
Countries	84	84	84	84
Country FE	Yes	Yes	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To do so, we start by regressing the severity and duration of a recession on a dummy variable for whether it was part of the Great Recession, meaning that it begins between 2007 and 2009. We extend the window through 2009 because in some countries the downturn associated with the Great Recession arrived later than in the United States and other directly affected advanced economies. Columns (1) and (3) show that indeed the Great Recession was accompanied by an unusually harsh labor market downturn, with unemployment rising by 2.0 percentage points more than a typical recession and lasting 2.7 quarters longer.

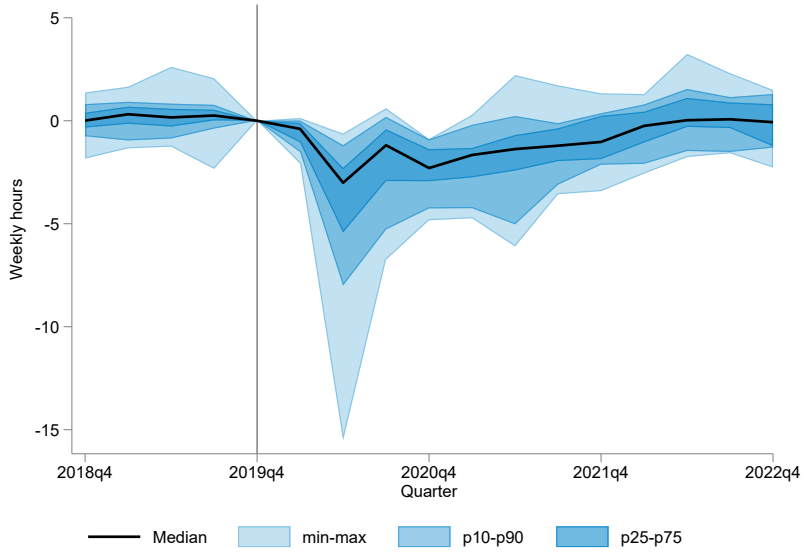
We then regress the severity and duration of a recession on a dummy variable for whether it was part of the Great Recession and dummy variables for the three main

shocks associated with the Great Recession: bank panics, bank equity crises, and house price busts. We see again that there are large effects on the bank panic and house price bust indicators, with a smaller role for the bank equity crisis indicator. After controlling for these, the coefficients on the Great Recession are cut by more than half and are no longer statistically significant. We conclude that much of the reason that the Great Recession was so severe was that it was associated with bank panics and house price busts.

Appendix B.6. COVID-19

COVID-19 was an unusual event in terms of labor market statistics, in two senses. First, it disrupted data collection. Several countries suspended collection activities entirely and so have no microdata and no reported unemployment rate in early 2020. Most other countries altered their data collection procedures and experienced changes in non-response rates. Labor market statistics from early 2020 should be treated with caution.

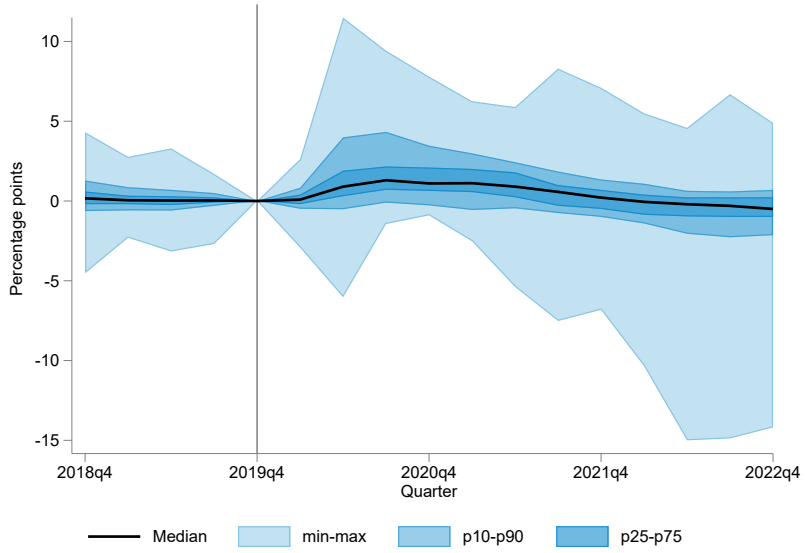
Figure B2: Effects of COVID-19 on Hours (Micro Dataset)



Second, the effects of COVID-19 on many labor market statistics, particularly the aggregate unemployment rate, are highly dependent on the details of policy. To help clarify matters, we use the micro dataset to estimate the path of average hours worked per person relative to 2019q4. Figure B2 plots the time series of select moments of this distribution. Every country with microdata has lower hours worked in 2020q2, ranging from a one hour decline in the least affected country to a fifteen hour decline in the most affected country; the median decline is about three hours. Hours worked per person remain depressed in most countries well into 2021. Hence, the data are clear that people in every country worked less.

However, the effects on measured employment and unemployment depend on the details of country restrictions and particularly how developed countries implemented

Figure B3: Effects of COVID-19 on Unemployment (Aggregate Dataset)



COVID relief policies (Breunig et al., 2024). Countries such as the United States that implemented these policies through the unemployment insurance system report elevated levels of unemployment, but countries that implemented them through payments to employers for keeping employees on their payroll report lower levels of unemployment. Figure B3 plots moments of the distribution across countries in the change in the unemployment rate relative to 2019q4. There is large variation associated with these differences in policy implementation, ranging from increases of more than 10 percentage points to declines of more than 5 percentage points within two quarters. We take from this that measured unemployment is not a useful indicator of the labor market effects of COVID-19.

Appendix B.7. Labor Market Conditions and Labor Market Policy

In the main analysis we frequently control for country fixed effects to help mitigate concerns that our results might capture cross-country differences in a wide range of policies, including notably labor market policies. In this appendix we instead control directly for a range of labor market policies. We are motivated by the large literature showing that labor market institutions affect the average level of unemployment and the rate at which workers reallocate in response to shocks (Hopenhayn and Rogerson, 1993; Nickell, 1997; Ljungqvist and Sargent, 1998; Blanchard and Wolfers, 2001; Jung and Kuhn, 2014). Labor market institutions also vary widely within our sample, for example between continental Europe and the United States or between developed and emerging economies.

Table B5: Unemployment Response to Recessions and Labor Market Policies

	Severity					Duration				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crisis	1.167**	0.327	0.757	0.373	0.482	0.671	0.767	0.498	0.622	1.212*
	(0.495)	(0.464)	(0.807)	(0.628)	(0.446)	(0.763)	(0.537)	(1.011)	(0.907)	(0.617)
Compound crisis	4.331***	5.917***	5.075***	5.059***	3.860***	4.653***	7.877***	6.234***	6.187***	4.670***
	(1.182)	(1.381)	(1.760)	(1.306)	(1.003)	(1.355)	(1.492)	(1.417)	(1.359)	(1.078)
Average UR 2 years pre-recession	-0.363***					-0.496***				
	(0.098)					(0.123)				
Min. wage/GDP per worker		0.051					-0.172			
		(0.218)					(0.246)			
Collective bargaining coverage			-0.240					1.604***		
			(0.370)					(0.323)		
Trade union density				-0.409					0.754*	
				(0.322)					(0.428)	
Share of unemployed receiving UI					0.003					1.072***
					(0.245)					(0.262)
Constant	5.096***	1.948***	2.431***	2.244***	2.309***	9.385***	4.530***	5.645***	5.343***	5.660***
	(1.266)	(0.266)	(0.356)	(0.334)	(0.217)	(1.589)	(0.330)	(0.411)	(0.488)	(0.269)
R^2	0.558	0.276	0.195	0.228	0.141	0.404	0.302	0.307	0.216	0.158
N	293	181	101	132	254	293	181	101	132	254
Countries	84	69	51	62	73	84	69	51	62	73
Country FE	Yes	No	No	No	No	Yes	No	No	No	No

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Measures of labor market institutions are standard normalized.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Our measure of labor market conditions is the average unemployment rate in the two years prior to the onset of the recession. For this specification, we control for country fixed effects, so that our estimates capture the extent of a labor market downturn when a country has an elevated level of unemployment relative to its average. The results for severity and duration are shown in columns (1) and (6) of Table B5. Downturns are less severe and shorter when the country has a high level of initial unemployment. Further, these effects are large: a one percentage point increase in the unemployment

rate is associated with a labor market downturn that is 0.36 percentage points less severe and half a quarter shorter.

We then investigate the effects of labor market institutions. We collect several measures from International Labour Organization (2025), including the statutory minimum wage, which we normalize by GDP per worker; the share of workers covered by collective bargaining; and the share of workers who are in a trade union. We also collect data on the share of unemployed workers who receive unemployment benefits by country for various years from 2006–2008 from International Labour Organization (2010). We standard normalize all variables of labor market institutions for ease of interpretation. ILO data are available at the country-year level, but data on access to UI come only from a single year, which we then apply to all years for the corresponding country. Because our interest is primarily in cross-country variation, we estimate the correlation between these policies and the severity and duration of the labor market downturn without controlling for country fixed effects. Our variation then comes mainly across countries. Columns (2)–(5) and (7)–(10) show the results.

The measures of labor market institutions have a small and imprecisely estimated effect on the severity of a labor market downturn. However, several of the measures have a large, positive, economically significant effect on duration. These estimates all point in the same direction: countries with more restrictive labor market institutions and more worker protections have longer labor market downturns. For example, a one standard deviation increase in the share of workers who receive unemployment insurance is associated with a 1.1 quarter longer labor market downturn. This finding suggests that to some extent, labor market downturns are longer in countries where workers are more protected from idiosyncratic risk. The effects for collective bargaining coverage and trade union density are quantitatively similar. However, the coefficients on recessions, crises, and compound crises are not statistically different from those that do not control for labor market institutions (Table 2, columns (1) and (4)), which implies that the long downturns after crises are not driven by labor market institutions of the affected countries.

Appendix B.8. Comparison of Results, Aggregate and Micro Datasets

We compare the average labor market response to recessions, crises, and compound crises in aggregate data and our micro datasets. We estimate the severity and duration separately in each. The results are shown in Tables B6 and B7.

Table B6: Unemployment Response to Recessions and Crises in Aggregate and Micro Datasets: Severity

	Unmatched samples		Matched sample	
	(1) Aggregate data	(2) Micro data	(3) Aggregate data	(4) Micro data
Crisis	0.590	1.937	1.787*	2.206
	(0.439)	(1.344)	(1.041)	(1.330)
Compound crisis	4.367***	7.004***	7.082***	7.272***
	(1.036)	(2.044)	(2.012)	(2.043)
Constant	2.174***	3.111***	2.465***	2.843***
	(0.209)	(0.649)	(0.487)	(0.607)
R^2	0.172	0.265	0.347	0.321
N	298	72	69	69
Countries	84	36	35	35
Country FE	No	No	No	No

Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Columns (1) and (2) in the tables compare results for the entire sample of recessions, crises, and compound crises in the aggregate versus micro datasets. The results are qualitatively similar, although there are some quantitatively large differences. For example, compound crises are estimated to be more severe when using the micro dataset. Most of the difference can be attributed to the fact that the two datasets cover different sets of recessions and crises. In columns (3) and (4), we estimate again the severity and duration, restricting attention to the 69 recessions (some of which are crises) in the two datasets. We can see that for this matched sample of recessions, the results are quantitatively similar. The main difference is that the severity of crises and compound crises is estimated to be slightly worse in the micro dataset. Overall, we conclude that our main findings of interest hold in both the aggregate and micro datasets and that the differences in how countries compute and report their official unemployment rate are not first-order for the study of the cyclical dynamics of labor markets.

Table B7: Unemployment Response to Recessions and Crises in Aggregate and Micro Datasets: Duration

	Unmatched samples		Matched sample	
	(1) Aggregate data	(2) Micro data	(3) Aggregate data	(4) Micro data
Crisis	1.134*	2.405*	2.868*	2.231
	(0.633)	(1.387)	(1.422)	(1.406)
Compound crisis	5.709***	8.321***	7.923***	8.147***
	(1.081)	(2.016)	(1.907)	(2.038)
Constant	5.691***	4.929***	5.077***	5.103***
	(0.314)	(0.460)	(0.566)	(0.524)
R^2	0.114	0.324	0.297	0.314
N	298	72	69	69
Countries	84	36	35	35
Country FE	No	No	No	No

Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix B.9. Additional Results on Aggregate Consequences of Crises

In the main text we focus on the severity of labor market downturns during recessions, crises, and compound crises measured using a wide variety of labor market indicators (Table 3). Table B8 shows the corresponding results for duration. Most variables take 3–6 quarters to reach their trough before recovery during a recession; crises and compound crises are consistently longer.

Table B9 re-estimates the severity results while controlling for the change in GDP per capita over the intervening period. This shows that compound crises are associated with the severity of a wide range of labor market indicators beyond what one would expect based solely on the decline in GDP per capita.

Table B8: Labor Market Outcomes During Recessions and Crises: Duration

Outcome	Crisis	Compound crisis	Constant	R^2	N	Countries	Country FE
Unemp. rate	2.405*	8.321***	4.929***	0.324	72	36	No
	(1.387)	(2.016)	(0.460)				
Long-term unemp. rate	1.382	9.417***	6.500***	0.338	65	29	No
	(1.643)	(2.071)	(0.856)				
Labor force part. rate	0.311	2.548	3.952***	0.059	73	36	No
	(0.811)	(1.816)	(0.429)				
Employment-population ratio	2.392**	8.607***	3.977***	0.382	74	36	No
	(0.982)	(2.042)	(0.429)				
Hours per person	0.644	5.907***	5.093***	0.221	74	36	No
	(0.959)	(1.848)	(0.440)				
Hours per employed	0.928	1.484	5.683***	0.019	71	35	No
	(1.155)	(1.728)	(0.737)				
Separation rate	1.045	2.422	3.744***	0.075	74	36	No
	(0.724)	(1.518)	(0.308)				
Job-finding rate	0.817	3.988**	4.762***	0.085	73	35	No
	(1.774)	(1.692)	(0.499)				
Job-to-job rate	-1.584	-1.300	6.467***	0.024	59	30	No
	(1.617)	(1.647)	(1.407)				
Mean log earnings	1.914	13.529***	3.471***	0.543	32	16	No
	(1.561)	(0.812)	(0.812)				
Mean log wage	-1.540	3.824	5.176**	0.046	30	15	No
	(2.652)	(6.745)	(2.059)				

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Finally, we study the role of self-employment during recessions and crises. Our micro dataset treats self-employment (including informal self-employment, own-account work, and unpaid family labor) as part of employment in all countries. However, recent research has provided evidence that self-employment plays a different role in developing countries, more akin to a substitute for missing unemployment insurance that allows people to earn income while searching for wage work (Schoar, 2010; Poschke, 2013; Donovan et al.,

Table B9: Changes in Labor Market Outcomes During Recessions and Crises: Severity, Controlling for GDP

Outcome	Crisis	Compound crisis	Severity, GDP	Constant	R^2	N	Countries	Country FE
Unemp. rate	0.784	5.823***	0.208**	1.487*	0.422	71	36	No
	(1.402)	(1.616)	(0.079)	(0.741)				
Long-term unemp. rate	-0.309	4.595***	0.155**	-0.079	0.544	65	29	No
	(0.657)	(1.213)	(0.075)	(0.469)				
Labor force part. rate	-0.472	2.084**	-0.149**	-1.277**	0.077	73	36	No
	(2.066)	(0.909)	(0.063)	(0.553)				
Employment-population ratio	-0.711	-2.366**	-0.294***	-1.067**	0.247	73	36	No
	(2.108)	(0.910)	(0.069)	(0.508)				
Hours per person	-0.615	0.444	-0.128**	-1.508***	0.128	73	36	No
	(1.314)	(0.677)	(0.049)	(0.495)				
Hours per employed	0.524	2.182**	-0.091**	-2.045***	0.076	70	35	No
	(1.356)	(0.948)	(0.038)	(0.625)				
Separation rate	-0.193	0.223	0.065**	0.631*	0.102	73	36	No
	(0.454)	(0.451)	(0.031)	(0.315)				
Job-finding rate	-0.737	-2.506	-0.148	-6.709***	0.046	72	35	No
	(1.992)	(3.062)	(0.156)	(1.354)				
Job-to-job rate	-0.348	0.222	0.032	-1.555***	0.013	59	30	No
	(1.175)	(1.174)	(0.063)	(0.518)				
Mean log earnings	0.091	1.640	0.067	-8.663***	0.005	32	16	No
	(4.914)	(3.078)	(0.233)	(2.666)				
Mean log wage	4.866	1.855	-0.108	-5.614***	0.072	30	15	No
	(3.216)	(2.477)	(0.130)	(1.777)				

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

2023). Some existing work suggests that this may alter the cyclicality of unemployment and self-employment in such countries (Bosch and Maloney, 2008; Fiess et al., 2010).

To analyze this further, we compare results for countries where self-employment might be expected to provide important insurance. Specifically, we identify a set of countries with high rates of self-employment before the onset of a recession (greater than 25 percent of total employment) and where few workers have access to unemployment insurance (less than 25 percent, using the data from International Labour Organization (2010)). This captures 12 countries in our sample: Bolivia, Brazil, Dominican Republic, Ecuador, Georgia, India, Jamaica, Mexico, Peru, Philippines, Paraguay, and West Bank and Gaza. We then estimate the cyclical dynamics for unemployment and for self-employment as a share of total employment. We use the same specifications as throughout the paper, but now we include a dummy for whether a country is one of the twelve countries where self-employment may act as insurance and an interaction between being in these twelve countries with whether a recession is a crisis. Table B10 shows the results.

We find that in countries where self-employment is a large share of employment at baseline, unemployment rises by slightly more during recessions (0.4 percentage points)

Table B10: Self-employment response to recessions and crises

	(1) Unemp. Rate	(2) Self Emp./Total Emp.
Crisis	2.323	-0.409
	(1.789)	(0.563)
Compound crisis	7.165***	0.267
	(2.198)	(0.414)
High SE share, low UI cov.	0.398	-0.031
	(1.289)	(0.469)
High SE share, low UI cov. × Crisis	-0.847	0.203
	(2.648)	(1.529)
Constant	2.950***	-0.978**
	(0.904)	(0.359)
R^2	0.267	0.012
N	72	75
Countries	36	36
Country FE	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

and self-employment as a share of total employment is roughly unchanged, as compared to countries where self-employment is not a large share of employment at baseline. We do not find any significant interaction with crises. We have no examples of countries where self-employment is important experiencing compound crises and so cannot estimate this interaction. This touches again on the fact that these are not causal estimates: one could imagine that economies where self-employment acts as an important insurance mechanism have less amplification and hence are less prone to compound crises in the first place. Our approach is not well-suited to estimate such an effect.

Appendix B.10. Additional Results on Distributional Consequences of Crises

The text focuses on select outcomes for the distributional analysis. We complement those results with a wider variety of outcome measures here. The text focuses on severity measures. Table B11 shows corresponding results for duration. The duration of the labor market downturn is similar for workers in different demographic groups.

Table B11: Unemployment response to recessions and crises by demographic groups: duration

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	1.313	2.016	2.740**	3.130*	3.071**	2.309
	(0.939)	(1.384)	(1.338)	(1.745)	(1.340)	(1.612)
Compound crisis	7.866***	7.905***	9.481***	8.608***	10.189***	4.458***
	(1.823)	(2.192)	(2.384)	(1.714)	(2.485)	(1.437)
Constant	5.634***	5.429***	5.103***	4.975***	4.561***	5.375***
	(0.451)	(0.547)	(0.705)	(0.451)	(0.464)	(0.608)
R^2	0.340	0.262	0.346	0.322	0.415	0.138
N	72	72	70	71	72	71
Countries	35	35	34	35	35	35
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

For brevity we analyze age and education separately in the text. Table B12 shows the results when we analyze the two jointly. For example, in the 25–54 age group, the less educated workers are more affected by recessions than the most educated (4.7 vs 2.4 percentage point increase in unemployment). Within the college group, young college workers are more affected by recessions than middle-aged or older college workers (4.8 versus 2.4 or 2.6 percentage point increase in unemployment).

For our final result on unemployment we explore controlling for the severity of the recession in terms of the extent of the GDP per capita decline. These results allow us to think about the demographic trends as capturing differential sensitivity to a decline in output and then differential sensitivity to crises or compound crises on top of the decline in output that they induce. Table B13 shows that both effects are present: younger and less educated workers experience a larger rise in unemployment for each percentage point decline in real GDP per capita. They also experience a larger additional rise in unemployment during compound crises.

Table B12: Unemployment response to recessions and crises by age and education: severity

	16-24			25-54			55+		
	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College
Crisis	2.361	1.791	2.781	0.793	0.102	0.303	-0.382	1.253	-0.007
	(2.179)	(1.677)	(2.004)	(1.410)	(1.855)	(0.687)	(1.548)	(1.363)	(0.672)
Compound crisis	16.086***	14.911***	5.633**	12.201***	7.407**	3.869**	11.916***	13.680**	1.354
	(4.916)	(3.796)	(2.437)	(3.269)	(2.816)	(1.472)	(4.029)	(6.477)	(1.632)
Constant	7.273***	5.542***	4.803***	4.736***	4.887***	2.364***	4.813***	2.587***	2.628***
	(1.241)	(0.882)	(0.835)	(0.891)	(1.628)	(0.498)	(1.218)	(0.840)	(0.537)
R^2	0.287	0.396	0.135	0.353	0.157	0.223	0.237	0.166	0.024
N	73	72	71	72	70	72	72	70	72
Countries	35	34	34	34	34	35	34	34	34
Country FE	No	No	No	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B13: Unemployment response to recessions and crises by demographic groups: severity, controlling for GDP

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	0.922	0.201	-0.257	-0.474	0.575	1.208
	(1.895)	(1.126)	(0.906)	(1.534)	(1.360)	(1.076)
Compound crisis	9.923***	4.878***	5.382***	10.880***	7.771***	1.898*
	(2.577)	(1.424)	(1.429)	(2.837)	(1.932)	(1.087)
Severity, GDP	0.277**	0.206***	0.223***	0.305***	0.254***	0.032
	(0.128)	(0.069)	(0.065)	(0.094)	(0.075)	(0.048)
Constant	2.830**	1.475**	0.837	2.057**	1.545**	2.236***
	(1.257)	(0.692)	(0.548)	(0.936)	(0.589)	(0.429)
R^2	0.422	0.428	0.501	0.510	0.526	0.114
N	71	71	69	70	72	71
Countries	35	35	34	35	35	35
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Severity, GDP measures the log difference in real GDP per capita between peak and trough.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B14 shows the results for severity of long-term unemployment computed separately by age and education level. The incidence of long-term unemployment (workers who are unemployed and report that the duration of their unemployment spell is a year or longer) is also concentrated among marginal workers, with a sharper education gradient than age gradient. As an example, workers without a high school degree experience an 11.8 percentage point rise in long-term unemployment during compound crises, whereas workers with a college degree experience only a 2.6 percentage point rise.

Tables B15 and B16 decompose movements in unemployment into the underlying movements in separation and job-finding rates. Separation rates consistently rise by

Table B14: Long-term unemployment response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	2.366	0.701	0.914	1.608*	0.859	0.114
	(1.603)	(0.749)	(0.563)	(0.891)	(0.999)	(0.376)
Compound crisis	5.595***	5.101***	6.129***	10.863***	7.353***	1.768**
	(1.720)	(1.513)	(1.510)	(2.894)	(2.057)	(0.672)
Constant	1.591***	0.955***	0.531***	0.971***	1.377***	0.855***
	(0.551)	(0.287)	(0.158)	(0.260)	(0.436)	(0.242)
R^2	0.233	0.374	0.477	0.481	0.379	0.193
N	65	64	66	64	65	65
Countries	29	29	30	29	30	30
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

more for younger and less educated workers. However, the results for job-finding rates are more nuanced. During a non-crisis recession, job-finding rates fall by 8–13 percentage points across the board, with little gradient across age groups or education levels. During compound crises a gradient does appear. For age it takes the standard form, where young workers experience a larger decline in the job-finding rate, but for education it reverses: college-educated workers experience a larger decline in job-finding rates than workers without a high school degree.

Table B15: Separation rate response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	0.628	0.056	-0.050	0.110	0.075	0.042
	(0.741)	(0.527)	(0.399)	(0.750)	(0.606)	(0.280)
Compound crisis	0.830	0.684	0.122	1.776*	1.005	0.272
	(0.704)	(0.452)	(0.387)	(0.940)	(0.705)	(0.352)
Constant	1.733***	1.135***	1.197***	1.745***	1.446***	0.919***
	(0.494)	(0.284)	(0.254)	(0.427)	(0.413)	(0.200)
R^2	0.012	0.024	0.001	0.060	0.023	0.007
N	74	72	74	73	74	71
Countries	36	36	36	36	36	34
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We provide results that move beyond unemployment as well. Tables B17 and B18 show the differential effects for employment-population ratios and labor force participation rates. They are broadly in line with the patterns from the unemployment estimates.

However, there is one result that acts as a counterpoint to this, which comes from

Table B16: Job-finding rate response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	-0.941	-4.327**	1.361	-3.471	0.375	-3.041
	(2.189)	(2.120)	(4.722)	(2.173)	(2.945)	(2.447)
Compound crisis	-4.381	-0.625	-1.153	-0.808	-4.575	-5.970
	(2.817)	(3.717)	(5.254)	(2.686)	(2.848)	(5.590)
Constant	-8.628***	-7.858***	-12.517***	-9.487***	-8.958***	-8.084***
	(0.928)	(1.069)	(2.238)	(1.188)	(1.630)	(1.420)
R^2	0.040	0.052	0.003	0.033	0.029	0.044
N	73	72	73	72	74	73
Countries	35	35	35	34	36	35
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B17: Employment-population response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	-3.466	-3.050	-2.170	-2.396	-2.508	-2.201
	(2.182)	(2.428)	(2.263)	(2.230)	(2.230)	(2.049)
Compound crisis	-7.533***	-3.140**	-0.914	-4.198**	-6.999***	-2.459**
	(1.909)	(1.276)	(1.293)	(2.052)	(1.974)	(1.171)
Constant	-4.648***	-2.799***	-3.324***	-4.247***	-4.365***	-3.197***
	(0.696)	(0.643)	(0.722)	(0.838)	(0.883)	(0.615)
R^2	0.215	0.063	0.026	0.070	0.142	0.045
N	73	72	73	74	71	72
Countries	35	35	35	35	35	35
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B18: Labor force participation response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	-0.404	-2.261	-1.601	-1.587	-0.380	-0.785
	(1.599)	(2.243)	(2.096)	(1.993)	(2.149)	(1.987)
Compound crisis	-1.606	1.188*	1.101	-0.295	1.453	1.091
	(1.157)	(0.666)	(0.743)	(1.096)	(1.219)	(0.935)
Constant	-3.539***	-1.640***	-2.546***	-3.137***	-4.018***	-2.513***
	(0.525)	(0.521)	(0.543)	(0.527)	(1.013)	(0.819)
R^2	0.015	0.051	0.031	0.018	0.010	0.015
N	73	73	73	74	70	72
Countries	35	35	35	36	34	34
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the intensive margin effects through hourly wages. Table B19 shows the results when we estimate the effect on hourly wages separately by age group and education level. The

main finding is that wages fall much *more* for older and more educated workers than for younger and less educated workers.

Table B19: Mean log wage per worker response to recessions and crises by demographic groups: severity

	Age groups			Education levels		
	16-24	25-54	55+	Less than HS Grad.	High School Grad.	College
Crisis	-0.628	4.136	2.315	3.936*	4.212	2.714
	(3.954)	(2.495)	(3.646)	(2.008)	(5.006)	(4.700)
Compound crisis	-3.423	1.549	5.598*	0.444	7.370*	2.995
	(6.806)	(2.991)	(3.063)	(4.015)	(3.644)	(2.687)
Constant	-5.006**	-6.645***	-9.623***	-7.585***	-10.699***	-10.064***
	(2.134)	(2.221)	(2.661)	(1.563)	(3.540)	(2.508)
R^2	0.008	0.067	0.022	0.079	0.041	0.016
N	31	29	32	30	32	32
Countries	15	15	15	15	16	16
Country FE	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix B.11. Additional Results on Interactions and Connections to Theory

This appendix provides additional results on interactions and connections to theory. We start with the sectoral results. We harmonize industries to be consistent with the indgen codes in Ruggles et al. (2025). This results in fifteen broad industries: agriculture, forestry, and fishing; mining and extraction; manufacturing; utilities (electricity, gas, water, and waste management); construction; wholesale and retail trade; hotels and restaurants; transportation, storage, and communications; financial services and insurance; public administration and defense; business services and real estate; education; health and social work; private household services; and other services.

Table B20 reports results on the sectoral employment-population ratio for the fifteen sectors. Table B21 shows the results for sectoral log employment.

Table B20: Sectoral transmission of crises for employment-population: severity

	Non-crisis recession	Crisis	Compound crisis	R^2	N	Countries
All sectors	-2.902***	-2.618	-4.553***	0.095	67	30
	(0.587)	(2.133)	(1.556)			
Agriculture, fishing, & forestry	-0.239***	0.123	-0.430	0.083	67	30
	(0.079)	(0.146)	(0.386)			
Mining	-0.062**	0.056	0.041	0.027	67	30
	(0.030)	(0.045)	(0.055)			
Manufacturing	-0.742***	-0.587*	-1.517***	0.234	67	30
	(0.126)	(0.332)	(0.392)			
Utilities	-0.019	0.101	-0.034	0.047	67	30
	(0.036)	(0.063)	(0.106)			
Construction	-0.619**	-0.277	-2.148***	0.232	67	30
	(0.253)	(0.387)	(0.749)			
Wholesale & retail trade	-0.457***	-0.450	-0.374	0.026	67	30
	(0.116)	(0.492)	(0.257)			
Hotels & restaurants	-0.252*	-0.237	0.015	0.015	65	30
	(0.128)	(0.345)	(0.184)			
Transportation, storage, & communication	-0.193**	-0.237	0.317	0.036	67	30
	(0.082)	(0.353)	(0.250)			
Financial services & insurance	-0.047	-0.014	0.354	0.042	67	30
	(0.084)	(0.144)	(0.374)			
Public & defense	-0.089	-0.147	-0.260	0.040	65	30
	(0.074)	(0.117)	(0.251)			
Real estate & business services	-0.180	-0.024	-0.247	0.013	60	30
	(0.141)	(0.167)	(0.473)			
Education	0.011	-0.170	0.163	0.066	65	30
	(0.063)	(0.137)	(0.202)			
Health & social work	0.131	-0.193	-0.149	0.018	65	30
	(0.146)	(0.162)	(0.178)			
Other services	-0.094	-0.304	-0.276	0.056	65	30
	(0.136)	(0.197)	(0.218)			
Private household services	-0.147*	-0.058	0.083	0.010	65	30
	(0.086)	(0.163)	(0.093)			

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We next ask whether crises affect emerging markets differently. We divide countries

Table B21: Sectoral transmission of crises for log employment: severity

	Non-crisis recession	Crisis	Compound crisis	R^2	N	Countries
All sectors	-4.396***	-4.691	-7.774**	0.068	68	30
	(1.408)	(4.548)	(3.005)			
Agriculture, fishing, & forestry	-7.766**	2.912	-10.554	0.040	68	30
	(3.231)	(5.725)	(9.493)			
Mining	-7.371	12.514	-7.093	0.024	68	30
	(6.374)	(10.783)	(18.736)			
Manufacturing	-6.702***	-8.458**	-19.593***	0.222	68	30
	(1.880)	(3.916)	(5.400)			
Utilities	-4.912	17.782	3.809	0.050	68	30
	(6.931)	(11.137)	(12.606)			
Construction	-11.307**	-6.072	-43.184***	0.241	68	30
	(4.480)	(7.569)	(15.021)			
Wholesale & retail trade	-3.268**	-3.984	-5.732*	0.036	68	30
	(1.256)	(4.407)	(2.901)			
Hotels & restaurants	-8.923*	-6.198	-0.552	0.011	66	30
	(4.484)	(9.664)	(5.917)			
Transportation, storage, & communication	-3.984**	-4.032	5.762	0.026	68	30
	(1.582)	(7.287)	(5.563)			
Financial services & insurance	-0.074	-4.838	10.730	0.035	68	30
	(3.330)	(5.396)	(15.622)			
Public & defense	-3.024	-1.660	-4.107	0.014	66	30
	(2.358)	(1.885)	(5.738)			
Real estate & business services	-4.835	-5.058	-39.588	0.053	61	30
	(3.646)	(5.629)	(47.022)			
Education	2.242	-6.957	0.336	0.063	66	30
	(1.491)	(4.673)	(3.314)			
Health & social work	2.763	-3.408	-4.544	0.011	66	30
	(3.950)	(4.168)	(4.952)			
Other services	-5.042	-9.715	-7.042	0.037	66	30
	(4.158)	(8.396)	(8.652)			
Private household services	-12.993	4.885	24.492	0.020	66	30
	(11.767)	(13.660)	(22.441)			

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

into two groups based on the S&P Dow Jones Indices' 2018 Country Classification. They distinguish between developed, emerging, and frontier economies; we group the last two together because there are few frontier economies with quarterly labor force surveys. We then estimate the relationship between the severity and duration of a labor market downturn and whether it is a crisis or a compound crisis interacted with whether the country is an emerging economy. Table B22 shows the results.

Columns (1) and (3) repeat the baseline analysis for reference. Columns (2) and (4) include the interactions. The specifications with interactions suggest that developing and emerging markets suffer larger and more protracted labor market downturns during crises and compound crises. The effects on crisis and compound crisis in columns (2) and (4) are smaller than their counterparts in columns (1) and (3); the interactions are positive but not statistically significant.

Table B22: Unemployment Response to Recessions: Emerging Markets

	Severity		Duration	
	(1)	(2)	(3)	(4)
Crisis	1.362**	1.166**	0.941	-0.142
	(0.562)	(0.554)	(0.836)	(1.004)
Compound crisis	4.622***	3.976***	4.851***	3.769**
	(1.233)	(1.386)	(1.446)	(1.790)
Emerging market x crisis		0.369		2.271
		(1.143)		(1.679)
Emerging market x compound crisis		1.369		2.159
		(2.517)		(2.884)
Constant	0.420***	0.420***	3.000***	3.000***
	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.498	0.501	0.358	0.366
N	298	298	298	298
Countries	84	84	84	84
Country FE	Yes	Yes	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We then turn to the effects of exchange rate and monetary policy. In the text we study the interaction between bursts of inflation and labor market downturns, where we define a burst of inflation as a four-quarter change in producer price inflation above the 90th percentile of the sample distribution of such changes. Table B23 shows results for alternative thresholds and for consumer price inflation as well, also from Ha et al. (2023). For severity, there is generally a negative marginal effect of high inflation, although the results are generally not statistically significant. For duration, the results are of mixed sign, consistent with the benchmark specification in the text.

Our final results show the heterogeneous impacts of policy, specifically the effect of fixed exchange rates, large depreciations, or bursts of inflation. In the text we provide aggregate results for countries with fixed versus flexible exchange rates as well as comparing countries with large depreciations or bursts of inflation to countries without them. Here we provide details of how these results trace through to different types of workers.

Tables B24–B26 show the results for workers of different age and education levels. Each table has a common format. The columns show results for workers of different age and education bins. The rows show the effects of a constant (which captures a non-crisis recession), crisis, and compound crisis. We then include a constant and interactions for having a fixed exchange rate (Table B24); for having a large depreciation (Table B25);

and for having a burst of inflation (Table B26).

These tables point to important heterogeneous effects, particularly for the interactions with compound crisis. Table B24 shows that a compound crisis in a country with a fixed exchange rate is associated with a much larger rise in unemployment among young and less educated workers. Table B25 shows that a large depreciation mitigates the effects of a compound crisis most for young and less-educated workers, while it has little effect for older and more-educated workers. Table B26 shows the smaller differential results by worker group during a burst of inflation.

We also investigate heterogeneous effects by initial earnings quintile. However, we have earnings data for fewer countries. We cannot estimate the relationship between a burst of inflation during a compound crisis and the rise in separation rates by initial earnings quintile because we do not have enough countries with earnings data that experience such an event. However, we do have cases for the interaction with a large depreciation, which we show in Table B27. We focus again on the main coefficient of interest, which is the heterogeneous effect of a large depreciation during a compound crisis. We see large negative effects for quintiles 1 and 2 but smaller effects for top quintiles, consistent with the idea that nominal wage rigidities may bind more for lower-paying workers.

Table B23: Unemployment Response to Recessions: Alternative Measures of High Inflation

	Severity						Duration					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Crisis	1.362**	1.201*	1.366**	0.734	1.445**	1.353**	0.941	0.863	1.054	0.406	0.778	0.927
	(0.562)	(0.659)	(0.598)	(0.671)	(0.584)	(0.588)	(0.836)	(0.905)	(1.087)	(1.355)	(1.005)	(0.913)
Compound crisis	4.622***	4.503**	5.770***	8.548**	4.792***	4.922***	4.851***	-0.632	4.868***	8.582**	5.423***	5.112***
	(1.233)	(1.971)	(1.610)	(3.269)	(1.571)	(1.431)	(1.446)	(1.740)	(1.756)	(3.449)	(1.948)	(1.628)
Δ PPI infl. > 5.1pp (80th pct)		-0.402						-2.470**				
		(0.490)						(0.940)				
Δ PPI infl. > 5.1pp (80th pct) × Crisis		0.359						0.252				
		(1.011)						(1.521)				
Δ PPI infl. > 5.1pp (80th pct) × Compound crisis		0.288						7.913***				
		(2.296)						(2.434)				
Δ PPI infl. > 16.6pp (95th pct)			-1.545**						-4.465***			
			(0.746)						(1.196)			
Δ PPI infl. > 16.6pp (95th pct) × Crisis			-0.141						-0.173			
			(0.897)						(2.284)			
Δ PPI infl. > 16.6pp (95th pct) × Compound crisis			-2.286						1.604			
			(1.965)						(2.467)			
Δ HCPI infl. > 2.6pp (80th pct)				-0.270						-1.522		
				(0.551)						(1.014)		
Δ HCPI infl. > 2.6pp (80th pct) × Crisis				1.019						0.979		
				(0.912)						(1.951)		
Δ HCPI infl. > 2.6pp (80th pct) × Compound crisis				-5.183						-4.619		
				(3.435)						(3.803)		
Δ HCPI infl. > 5.4pp (90th pct)					-1.138						-1.542	
					(0.877)						(1.246)	
Δ HCPI infl. > 5.4pp (90th pct) × Crisis					-0.101						0.796	
					(1.166)						(1.905)	
Δ HCPI infl. > 5.4pp (90th pct) × Compound crisis					-0.274						-1.329	
					(2.244)						(3.179)	
Δ HCPI infl. > 9.5pp (95th pct)						-2.692**						-1.959
						(1.134)						(1.715)
Δ HCPI infl. > 9.5pp (95th pct) × Crisis						2.516						1.913
						(1.628)						(2.317)
Δ HCPI infl. > 9.5pp (95th pct) × Compound crisis						-0.300						-0.448
						(2.269)						(4.129)
Constant	0.420***	0.823*	0.420***	0.420***	0.420***	0.420***	3.000***	5.470***	3.000***	3.000***	3.000***	3.000***
	(0.000)	(0.490)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.940)	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.498	0.500	0.547	0.541	0.516	0.522	0.358	0.404	0.437	0.386	0.370	0.363
N	298	298	298	298	298	298	298	298	298	298	298	298
Countries	84	84	84	84	84	84	84	84	84	84	84	84
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Sample consists of all recessions that occur during periods covered by the aggregate dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B24: Unemployment response to recessions and crises by age and education: the role of fixed exchange rates

	16-24			25-54			55+		
	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College
Crisis	4.238	1.651	0.846	2.741	1.232	0.267	0.408	2.192	0.493
	(3.313)	(2.446)	(1.765)	(2.261)	(1.565)	(0.683)	(1.748)	(1.777)	(0.706)
Compound crisis	7.630	5.611*	1.072	5.783**	2.969	1.937	8.919	5.984	-1.807
	(5.455)	(3.264)	(0.937)	(2.343)	(2.447)	(1.818)	(5.626)	(4.451)	(1.679)
Fixed exchange rate	1.341	0.162	0.050	0.282	2.588	0.557	-2.018	-0.330	1.059
	(2.724)	(1.701)	(1.660)	(1.816)	(3.371)	(0.980)	(1.401)	(1.581)	(1.117)
Fixed exchange rate × Crisis	-0.610	1.232	4.102	-2.380	-2.155	0.257	1.301	-1.410	-0.348
	(4.687)	(3.523)	(3.820)	(2.856)	(3.808)	(1.447)	(2.388)	(2.409)	(1.312)
Fixed exchange rate × Compound crisis	16.324**	16.531***	7.829**	11.905**	7.207	3.268	7.576	13.224	5.689**
	(7.639)	(4.930)	(3.794)	(4.869)	(4.783)	(2.690)	(7.713)	(11.130)	(2.473)
Constant	5.424***	5.105***	4.769***	4.045**	3.611***	2.064***	4.568***	2.761***	1.852***
	(1.916)	(1.012)	(0.882)	(1.501)	(1.002)	(0.542)	(1.245)	(0.665)	(0.617)
R^2	0.469	0.583	0.254	0.519	0.256	0.301	0.419	0.214	0.232
N	68	67	67	67	66	68	67	66	67
Countries	34	33	33	33	33	34	33	33	33
Country FE	No	No	No	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B25: Unemployment response to recessions and crises by age and education: the role of depreciation shocks

	16-24			25-54			55+		
	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College
Crisis	1.284	0.895	2.313	0.097	-0.949	-0.118	-1.435	0.852	-0.357
	(2.377)	(1.835)	(2.332)	(1.627)	(2.269)	(0.718)	(1.789)	(1.640)	(0.741)
Compound crisis	16.748***	15.554***	5.469*	12.815***	7.121**	3.811**	12.253***	14.498*	1.021
	(5.375)	(4.150)	(2.793)	(3.567)	(3.321)	(1.623)	(4.438)	(7.192)	(1.862)
Large depreciation	-3.236*	-2.565*	-2.580**	-2.118	-4.376*	-2.008***	-3.751**	-1.803	-2.314***
	(1.754)	(1.283)	(1.206)	(1.833)	(2.157)	(0.576)	(1.768)	(1.249)	(0.708)
Large depreciation × Crisis	6.155	5.135*	0.897	3.823	3.706	1.356	5.062**	1.218	0.276
	(4.727)	(2.807)	(3.252)	(2.580)	(2.718)	(0.981)	(2.201)	(2.153)	(0.863)
Large depreciation × Compound crisis	-13.961**	-12.658***	-3.184	-11.450***	-5.659	-3.170*	-11.267**	-13.565*	-0.464
	(5.271)	(4.244)	(2.912)	(3.895)	(3.414)	(1.682)	(4.573)	(7.257)	(1.922)
Constant	8.043***	6.167***	5.448***	5.253***	6.009***	2.854***	5.728***	3.049***	3.192***
	(1.536)	(1.084)	(1.073)	(1.076)	(2.107)	(0.500)	(1.520)	(1.112)	(0.621)
R^2	0.331	0.448	0.170	0.405	0.226	0.309	0.288	0.188	0.094
N	73	72	71	72	70	72	72	70	72
Countries	35	34	34	34	34	35	34	34	34
Country FE	No	No	No	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B26: Unemployment response to recessions and crises by age and education: the role of high inflation shocks

	16-24			25-54			55+		
	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College	Less than HS Grad.	High School Grad.	College
Crisis	2.776	1.750	3.145	-0.107	0.196	0.298	-1.172	-1.042	-0.011
	(2.455)	(2.037)	(2.698)	(1.566)	(1.936)	(0.957)	(2.088)	(2.122)	(0.795)
Compound crisis	17.607**	14.981***	5.357*	13.332***	7.219**	3.686*	11.684**	6.235	0.751
	(6.744)	(5.046)	(3.058)	(3.862)	(3.429)	(1.859)	(4.735)	(4.085)	(2.767)
Δ producer price infl. > 9.8pp (90th pct)	0.937	0.108	-0.053	-1.365	-0.049	-0.952	-2.427	-5.352	0.098
	(1.793)	(2.198)	(1.119)	(1.400)	(1.487)	(0.723)	(1.857)	(3.854)	(1.037)
Δ producer price infl. > 9.8pp (90th pct) × Crisis	-1.404	0.131	-1.154	2.846	-0.296	0.013	2.493	7.404	0.004
	(3.218)	(3.090)	(3.424)	(2.208)	(2.117)	(1.175)	(2.456)	(4.519)	(1.332)
Δ producer price infl. > 9.8pp (90th pct) × Compound crisis	-3.444	-0.180	0.572	-1.763	0.395	0.715	1.353	16.947	1.166
	(9.932)	(7.751)	(4.933)	(6.445)	(4.870)	(2.891)	(7.999)	(13.021)	(3.293)
Constant	7.005***	5.507***	4.820***	5.169***	4.903***	2.666***	5.582***	4.234**	2.599***
	(1.479)	(0.770)	(0.708)	(1.032)	(1.513)	(0.664)	(1.698)	(2.005)	(0.573)
R^2	0.291	0.397	0.137	0.367	0.157	0.241	0.246	0.227	0.030
N	73	72	71	72	70	72	72	70	72
Countries	35	34	34	34	34	35	34	34	34
Country FE	No	No	No	No	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B27: Separation rate response to recessions and crises by earnings groups: the role of depreciation shocks

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Crisis	1.868	0.967	0.459	-0.127	-0.773***
	(1.777)	(1.036)	(0.968)	(0.590)	(0.260)
Compound crisis	2.497***	2.338**	0.627	1.125***	-0.816***
	(0.862)	(0.872)	(0.616)	(0.358)	(0.257)
Large depreciation	-0.643	-0.060	-0.164	-0.717*	-0.867**
	(1.038)	(0.914)	(0.648)	(0.397)	(0.326)
Large depreciation × Crisis	1.909	0.472	0.817	0.608	1.242***
	(1.854)	(1.107)	(0.947)	(0.586)	(0.337)
Large depreciation × Compound crisis	-2.665**	-1.918**	0.184	-0.870**	0.752**
	(1.038)	(0.914)	(0.648)	(0.397)	(0.326)
Constant	1.763*	1.003	0.871	1.209***	1.303***
	(0.862)	(0.872)	(0.616)	(0.358)	(0.257)
R^2	0.066	0.037	0.013	0.034	0.111
N	47	47	48	48	49
Countries	24	24	24	24	24
Country FE	No	No	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors clustered at the country level and reported in parentheses.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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