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 affect marginal workers – younger, less-educated, and lower-earnings workers – more, and fall particularly on the manufacturing and construction sectors. We provide evidence of the importance of several mechanisms discussed in the literature, including labor market policy, exchange rate policy, and inflation, and show that these policies particularly affect marginal workers.

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

1. Introduction

Globally, large economic downturns of at least 15 percent declines in output and consumption happen with 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 (1987).

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[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) 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.

Recently, 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 insights can interact if crises raise exposure to uninsurable risk for workers. However, understanding 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. Solving these issues is important not only for measuring welfare costs directly, but because of their central role in macro-prudential policy effectiveness (Svensson, 2017; Allen and Greenwald, 2022; Guntin et al., 2023).[2]

Our contribution in this paper is to apply new data to shed light on the heterogeneous effects of rare crises. To do so, we bring to bear harmonized micro data derived from rotating panel labor force surveys conducted around the world. The dataset covers 88 million observations, where each observation is one person matched for two consecutive quarters. This allows us to measure employment status and changes in employment status for workers in different demographic groups, with different income levels, and working in different sectors. At the aggregate level, the dataset is an unbalanced panel spanning 43 countries and 96 recessions, which allows us to observe 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 321 recessions, where we define a recession as any period of two or more consecutive quarters of negative real GDP per capita growth.[4]

Our first motivating finding concerns 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 most severe decile of recessions has an empirical arrival rate of 1.4% per year (similar to what Barro

[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).

[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.

(2006) finds with GDP disasters) and includes unemployment rates that rise by 9–20 percentage points and 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.

Our second result links these severe labor market downturns with crises. We use external databases or rules that point to a wide variety of potential shocks that may correlate with or cause particularly severe downturns. Roughly, crises are a subset of recessions. They also turn out to be the most severe in terms of labor market outcomes. We find that eight of the ten most severe labor market downturns in our data are associated with one of three shocks: banking panics, house price busts, or sudden stops. Six are associated with two or more of these shocks happening at the same time, a phenomenon that we label a multi-dimensional crisis. We estimate that labor market downturns during a crisis are associated with a 0.5 percentage point larger rise in the unemployment rate and last 1.1 quarters longer than the typical recession; for multi-dimensional crises the same figures are 4.3 percentage points larger and 5.7 quarters longer than 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 fact suggests that the effects do not proxy for underlying differences in the policies or conditions of countries that experience a crisis.

We then 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, hours worked, wages, and earnings. Moreover, whereas long-term unemployment plays a negligible role in non-crisis recessions, it rises by 1.8 percentage points during crises and 6.2 percentage points during multi-dimensional 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. 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 who 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, above and beyond what is available in the U.S. CPS. Indeed, Guntin et al. (2023) find high consumption elasticities in the five crisis events for which they have consumption micro-data, suggesting that this risk is closely

connected to welfare.

Finally, we use a combination of the aggregate and micro data to provide several results that connect to the existing literature that suggests mechanisms and policies that affect the severity of a macroeconomic crisis. We show that manufacturing and construction account for more than half of all the employment losses during crises. We show that restrictive labor market policies and generous unemployment insurance are associated with longer-lasting labor market downturns. We build on the literature by showing that fixed exchange rates are associated with longer and more severe labor market downturns, particularly when associated with current account deficits; and that currency depreciations and high inflation can mitigate the severity and duration of a labor market downturn (Domaç and Martinez Peria, 2003; Schmitt-Grohé and Uribe, 2016; Calvo et al., 2025; Blanco et al., 2025). We add to the literature by showing that these results have particularly significant consequences for marginal workers, whose labor market outcomes are consistently much more sensitive to each of these factors. For example, high inflation during a multi-dimensional crisis reduces the unemployment rate of young, less than high school educated workers by more than 12 percentage points, but has no effect on middle-aged, college-educated workers.

Our paper is closely related to research that investigates the economic outcomes associated with specific events or crises. For example, Metrick and Schmelzing (2025) take a historical perspective to highlight how financial crises affect different countries throughout history, and how their frequency and severity varied over time. Our final contribution is closely related to work that has identified particular mechanisms, such as the cost of defending a fixed exchange rate or the consequences of nominal wage rigidity during a crisis (Kaminsky and Reinhart, 1999; Schmitt-Grohé and Uribe, 2016; Calvo et al., 2025; Blanco et al., 2025). Our contribution to the literature is twofold. First, we develop a large database that enables us to document patterns using a large set of recessions and crises. We generally confirm the importance of the mechanisms and policies highlighted in the literature. Second, we use our micro database to investigate the consequences of these policies and mechanisms for workers and find large differences across worker groups, with marginal workers consistently bearing the greatest unemployment risk.

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 for as many countries as possible. 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.

Our aggregate labor dataset consists of the quarterly unemployment rate for all countries that calculate and publish it. The advantage of this dataset is its breadth of coverage, which is useful for characterizing the full distribution of labor market responses to recessions and especially less common events such as banking panics or house price busts. On the other hand this dataset is shallow, in that it does not offer us any scope to characterize how macroeconomic crises propagate through labor markets or who they affect.

We complement it with a micro labor dataset we built from the subset of these labor force surveys that make micro data available to researchers and that also use a rotating panel design. This dataset is narrower than the first, but still covers nearly 100 recessions. At the same time, the fact that we have access to micro data allows us to study recessions and crises more deeply. 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 for as many countries as possible. 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 taking the fourth root of the year-over-year growth rate. This choice reflects a compromise: estimating and removing quarterly fixed effects performs well in countries with short time series but not in countries with long time series; more sophisticated methods work well with long time series but are not appropriate for countries with fewer than ten years of data.

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.[5] 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 people aged 15–74. Countries also differ slightly in how they define who is unemployed.[6] 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 1947 into 2025. See Table A1 for countries and time periods covered. The main advantage of this aggregate dataset is its breadth; in total, it covers 321 recessions (Table A1 shows the distribution of recessions across countries). The main disadvantage is that aggregate data do not offer much scope to understand how aggregate 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

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

[6] 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.

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 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 they track the same household for multiple periods. Second, this design allows households to be tracked for at least two consecutive quarters, which allows for the largest comparable set of countries. 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). This allows us to study both labor market states and labor market flows in a consistent way for all workers and countries in the micro dataset. 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 54 countries. We focus again on the subset of countries with data spanning at least five years. We merge on 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 43 countries and 96 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. This includes a wide range of labor market outcomes, including employment, hours worked, unemployment, and long-term unemployment.[7] For roughly one-third of countries we have information on monthly labor earnings and hourly wages; for roughly 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 notably 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

[7]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.

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 321 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, 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

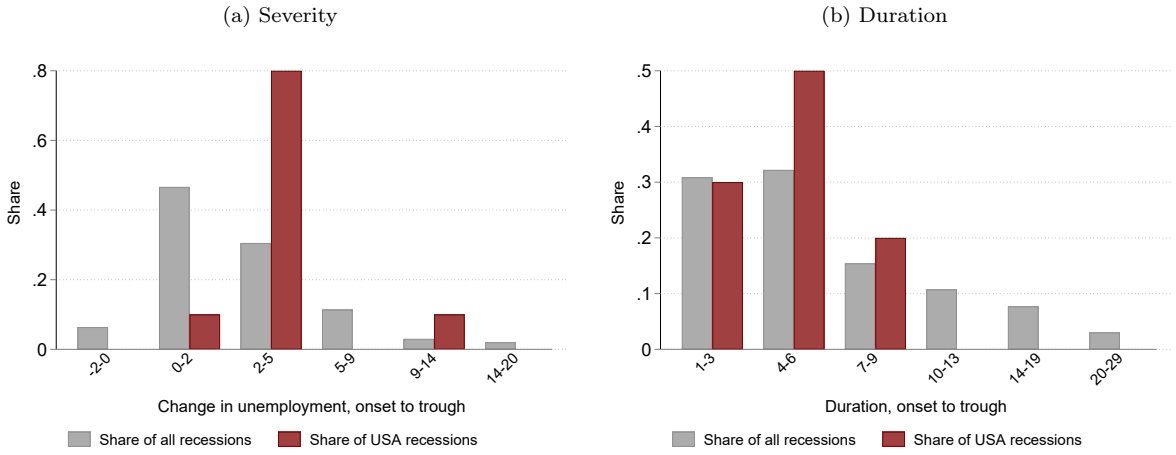

Figure 1 shows that the distribution of both severity and duration is right-skewed. While half of the recessions imply a 0–2 percentage point increase in unemployment, the right tail is long. During the ten most severe labor market downturns the unemployment rate rises by at least 10 percentage points 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, in the sense that the most severe labor market downturns are often linked to these shocks and also that these shocks are linked to severe labor market downturns. While these results are of course not causal, the size of our aggregate dataset also makes it possible for us to control for some possible confounding factors and to estimate effects from subsets of the data, which allows us to show that this correlation survives a number of controls and is not driven by a few outlier crises.

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).[8]

In each case, we say that a recession is accompanied by a crisis if one of these three types of shocks

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

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 multi-dimensional 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.

An important advantage of our approach of assembling large datasets spanning many countries is that it gives us a sufficient sample to study these otherwise rare events. Our aggregate dataset spans 321 recessions. Of these recessions, 87 are crises (suffering only one shock) and 32 are multi-dimensional crises (suffering two or more shocks). Our micro dataset spans 96 recessions. Of these recessions, 20 are crises by our definition and 15 are multi-dimensional 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 multi-dimensional 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, in the sense that these crises often cause severe downturns and most severe downturns can be linked to these crises. We discuss each direction in turn.

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 (e.g., 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	Costa Rica	2018q2–2018q4	15.22	
4	Finland	1990q1–1993q2	14.53	Bank panic, House price
5	Estonia	2007q3–2009q3	14.27	House price, Sudden stop
6	Latvia	2008q1–2010q2	14.13	House price, Sudden stop
7	Lithuania	2008q2–2009q4	13.80	House price, Sudden stop
8	Cyprus	2008q2–2009q3	12.89	Sudden stop
9	Serbia	2008q2–2009q1	12.51	Sudden stop
10	Costa Rica	2019q4–2020q2	11.50	

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. Eight 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). Six of the ten are multi-dimensional crises associated with

two or three of these events. Thus, while these shocks are generally rare, we see that they are ubiquitous during severe labor market downturns.[9]

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 recession, a crisis, or a multi-dimensional 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	0.529	1.362***	1.111***	1.123*	0.941	0.419
	(0.392)	(0.424)	(0.398)	(0.633)	(0.782)	(0.722)
Multi-dimensional crisis	4.306***	4.622***	4.134***	5.698***	4.851***	2.343**
	(0.578)	(0.589)	(0.556)	(0.933)	(1.085)	(1.071)
Severity, GDP			0.146***			
			(0.026)			
Duration, GDP						0.606***
						(0.095)
Constant	2.235***	0.420	-1.066	5.702***	3.000	1.183
	(0.214)	(2.587)	(2.429)	(0.346)	(4.766)	(4.386)
R^2	0.159	0.531	0.593	0.113	0.356	0.460
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 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 multi-dimensional 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 quarters before the recovery begins. The coefficients on crisis and multi-dimensional crisis reflect the *additional* effect associated with the respective event. For example, the coefficient on multi-dimensional crisis indicates that unemployment rises by nearly three times as much during such events ($2.2 + 4.3 = 6.5$ percentage points in total). Similarly, the coefficients in column (4) show that labor market downturns associated with multi-dimensional 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,

[9]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.

the coefficients are estimated off of within-country, cross-recession variation. Including country fixed effects has only modest effects on our estimates; the estimated severity of crises and multi-dimensional crises rises slightly, while the estimated duration declines slightly.

Finally, we explore controlling for the change in GDP during the recession. Specifically, in column (3) we estimate the relationship between crises or multi-dimensional 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 multi-dimensional 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. Thus, we conclude that crises contribute to the severity of the labor market downturn above and beyond their effect on declining real GDP per capita, but that they affect duration mainly by depressing the recovery in real GDP per capita for longer.

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 multi-dimensional 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 containing harmonized data on workers matched across two consecutive quarters spanning 43 countries and 96 recessions. We use this to widen the set of labor market outcomes beyond the unemployment rate to other aggregate labor market outcomes that we have harmonized.

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 inflection point 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 a dummy for whether the recession was a crisis or a multi-dimensional crisis. The results are shown in Table 3.[10]

Each column of this table captures a different labor market outcome. As with column (1) 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 multi-dimensional crisis reflect the additional effect associated with the respective event.

The first five columns show the behavior of aggregate labor market stocks. Column (1) 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.7 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 is not of first-order importance for researchers interested in cyclical labor market dynamics.

Column (2) 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 6.2 percentage points (=0.010+0.052) during multi-dimensional crises.

Columns (3) and (4) 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. The important finding here is that employment-population ratios mirror unemployment rates: they decline by 2.8 percentage points during a recession and 8.0 percentage points during a multi-dimensional crisis.

Columns (5) and (6) 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 2.5 hours per week during a recession. The fall in hours per person is worse during crises and multi-dimensional crises, mostly reflecting that these events have large effects through the extensive margin of employment. Hours per worker actually fall by less during crises and multi-dimensional crises than during recessions.

Columns (7)–(9) show the behavior of labor market flows, which we measure using changes in labor force status for workers matched across two consecutive quarters. Columns (7) and (8) show the importance of rising separation rates and declining job-finding rates for the rise in unemployment.[11] Both

[10] The corresponding results for duration are available in Appendix B.8.

[11] 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

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

	(1) Unemp. Rate	(2) Long-term Unemp. Rate	(3) Labor Force Part. Rate	(4) Employment-Population Ratio	(5) Hours per Person	(6) Hours per Employed	(7) Separation Rate	(8) Job-finding Rate	(9) Job-to-job Rate	(10) Mean log earnings	(11) Mean log wage
Crisis	0.022*	0.008	-0.018	-0.027*	-1.491*	-0.486	0.002	-0.013	-0.001	0.007	0.033
	(0.011)	(0.009)	(0.013)	(0.014)	(0.815)	(0.840)	(0.004)	(0.024)	(0.009)	(0.036)	(0.030)
Multi-dimensional crisis	0.066***	0.052***	0.008	-0.052***	-0.820	1.294	0.006	-0.065**	-0.000	0.016	0.012
	(0.012)	(0.009)	(0.014)	(0.016)	(0.903)	(0.914)	(0.005)	(0.027)	(0.010)	(0.074)	(0.058)
Constant	0.029***	0.010**	-0.022***	-0.028***	-2.327***	-2.517***	0.010***	-0.076***	-0.014**	-0.083***	-0.056***
	(0.006)	(0.005)	(0.007)	(0.008)	(0.459)	(0.469)	(0.002)	(0.014)	(0.006)	(0.024)	(0.019)
R^2	0.282	0.310	0.040	0.140	0.045	0.040	0.023	0.074	0.000	0.002	0.044
N	76	71	78	78	78	76	77	77	58	32	30
Countries	37	31	37	37	37	37	37	37	31	16	15
Country FE	No	No	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

flows move in the expected direction, with a greater rise in separation rates and a greater decline in job-finding rates after crises and particularly after multidimensional crises.

One simple way to put these figures into context is to use the well-known fact that if we abstract from movements into and out of inactivity, the steady state unemployment rate implied by a given pair of flows is equal to separation rate/(separation rate + job-finding rate). 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. Columns (7) and (8) show that during multi-dimensional crises, the separation rate rises by 1.6 percentage point and the job-finding rate falls by 14.1 percentage points, which implies a new steady-state unemployment rate of 4.1/(4.1+15.9) = 20.5 percent. This figure is slightly larger than the results implied by column (1), possibly because discouraged workers exit unemployment or because the economy recovers before fully reaching the new higher steady state.

We can use this calculation to provide a simple estimate of the contribution of each of these changes. Changing the separation rate alone leads to an implied unemployment rate of 12.0 percent, while changing the job-finding rate alone leads to an implied unemployment rate of 13.6 percent. From this calculation we conclude that the decline in the job-finding rate accounts for slightly more of the overall rise in the unemployment rate during multi-dimensional crises. This finding is in line with the more recent consensus that the 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).

Column (9) shows that the job-job transition rate also falls during recessions and crises. This estimate shows that all recessions involve a disruption of the job ladder. There is no extra effect for crises or multi-dimensional crises, which mainly involve non-employment.

Finally, columns (10) and (11) show the effects on mean log monthly earnings 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 multi-dimensional 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 employment and hours worked. The fall in earnings and wages is actually slightly smaller in crises and multi-dimensional crises, likely because their effects are felt primarily at the extensive margin.

This first set of results using the micro dataset show that the deterioration of labor market outcomes during recessions and particularly crises and multi-dimensional crises is widespread, in the sense that it

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).

shows up in all conventionally measured labor market outcomes. 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 B8). The extent of the decline in GDP per capita strongly correlates with the deterioration of most labor market outcomes, but we again find that crises and multi-dimensional crises have an economically and statistically effect on the severity of the labor market downturn for many measures 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 B9).

These results still focus on aggregate results, albeit a wider range of them. In the next section we use the microdata further to understand who is affected most by recessions, crises, and multi-dimensional crises.

4. Distributional Consequences of Crises

Our results so far show that crises are associated with severe and long-lasting labor market downturns that show up in all labor market outcomes. We now use the micro dataset to ask who is affected most by crises. 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 age (25–54 years old), and older (55 years and older).[12] 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 multi-dimensional 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 all countries, consistent with the U.S. experience. The estimates for a crisis or a multi-dimensional crisis show that the additional increase in unemployment during these

[12]We focus on current age, which implies that the underlying workers in each age group are changing over time. We explored controlling simultaneously for the cohort effect of having entered the labor market during a recession, which we found to be less important. We also explored gender differences and found them to be small.

events is also larger for young workers. The cumulative effects are large: young workers experience an 18.1 percentage point increase in unemployment during multi-dimensional 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	0.043**	0.024**	0.018*	0.014	0.021	0.014*
	(0.019)	(0.011)	(0.010)	(0.018)	(0.013)	(0.007)
Multi-dimensional crisis	0.136***	0.074***	0.060***	0.122***	0.087***	0.018**
	(0.021)	(0.012)	(0.011)	(0.020)	(0.015)	(0.008)
Constant	0.045***	0.030***	0.021***	0.041***	0.035***	0.025***
	(0.011)	(0.006)	(0.006)	(0.010)	(0.008)	(0.004)
R^2	0.373	0.360	0.297	0.352	0.324	0.085
N	75	76	75	75	76	75
Countries	36	36	36	36	36	36
Country FE	No	No	No	No	No	No

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

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. We again construct severity separately for each education group and recession and regress this education-specific severity on whether a recession was a crisis or a multi-dimensional crisis. 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 two to three times as large as workers with some college.

We expand on these results in a number of ways in Appendix B.9. We show the duration of the labor market downturn is 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 multi-dimensional crisis.

We also examine the incidence of unemployment by earnings level. Recall that in the micro dataset we track workers for two consecutive quarters. In order to know their earnings, we need to see them employed in the initial quarter; studying their subsequent unemployment is then equivalent to studying separation rates by initial earnings level. We construct separation rates by (country-specific) earnings quintiles, which allows us to use data from more countries, including roughly one-third of the sample where we only observe earnings in bins. We thus compute the severity in terms of the rise in the separation rate by initial earnings quintile. The results are shown in Table 5.

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

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Crisis	0.011	0.007	0.003	-0.004	-0.005
	(0.010)	(0.009)	(0.006)	(0.004)	(0.004)
Multi-dimensional crisis	0.011	0.009	0.004	0.002	-0.006
	(0.022)	(0.020)	(0.014)	(0.010)	(0.009)
Constant	0.015**	0.014***	0.011***	0.013***	0.010***
	(0.006)	(0.005)	(0.004)	(0.003)	(0.002)
R^2	0.032	0.018	0.006	0.020	0.044
N	44	44	45	44	46
Countries	23	23	23	23	23
Country FE	No	No	No	No	No

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

The results again show that more marginal workers are more affected by recessions and severe labor market downturns. The constant term shows that during a non-crisis recession, workers in the bottom earnings quintile have increases in separation rates that are roughly 50 percent larger than those in the top earnings quintile. The top two rows show the marginal effect of a crisis and a multi-dimensional crisis. These results are qualitatively consistent with the patterns in the rest of this section and quantitatively large. For example, workers in the bottom earnings quintile have a 2.6 percentage point rise in separation rates during a multi-dimensional crisis, whereas those in the top earnings quintile have only a 0.4 percentage point rise. However, most of these marginal effects are not statistically significant at conventional levels.

These results paint a consistent picture: more marginal (younger, less educated, and lower earning) workers are more affected by recessions, crises, and multi-dimensional crises than their peers. There is one result that potentially does not align with this finding. In Appendix B.9 we show that the wage losses for younger and less-educated workers are 2–3 percentage points smaller than their older and more-educated peers, with this gap growing during crises and multi-dimensional 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 study several areas where our results connect to existing theories about the mechanisms and extent of labor market downturns. We use our data to test the mechanisms and predictions of these theories, to quantify the magnitude of the interactions, and to provide novel evidence on the implications for different types of workers.

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

	All sectors	Manufacturing	Construction
Crisis	-0.028*	-0.006**	-0.004
	(0.015)	(0.003)	(0.003)
Multi-dimensional crisis	-0.048**	-0.015***	-0.022***
	(0.018)	(0.003)	(0.004)
Constant	-0.027***	-0.007***	-0.005**
	(0.009)	(0.002)	(0.002)
R^2	0.116	0.255	0.337
N	67	67	67
Countries	31	31	31
Country FE	No	No	No

Sample consists of all recessions that occur during periods covered by the micro dataset.
Standard errors 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.[13] 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 aggregate employment-population ratio.

The last two columns of Table 6 show the results for two key sectors: manufacturing and construction. We focus on these two sectors because they account for a large share of the employment loss during recessions and crises and particularly during multi-dimensional crises. For example, they account for 44 percent of the employment loss during a recession and 65 percent during multi-dimensional 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.10. There we show similar results for all sectors. 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

[13] 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.

in particular are key for business cycle propagation in labor markets, particularly during crises and multi-dimensional crises.

5.2. Labor Market Conditions and Labor Market Policy

We next investigate whether the state of the labor market and labor market policies affect the extent of the labor market downturn associated with a recession or crisis. 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 7: Unemployment Response to Recessions and Labor Market Policies

	Severity					Duration				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Crisis	1.168***	0.218	0.627	0.230	0.422	0.672	0.748	0.475	0.598	1.202*
	(0.400)	(0.533)	(0.880)	(0.651)	(0.423)	(0.766)	(0.637)	(0.976)	(0.814)	(0.638)
Multi-dimensional crisis	4.327***	5.833***	4.903***	4.913***	3.812***	4.652***	7.863***	6.204***	6.162***	4.662***
	(0.554)	(0.770)	(1.117)	(0.906)	(0.635)	(1.060)	(0.921)	(1.240)	(1.133)	(0.958)
Average UR 2 years pre-recession	-0.370***					-0.497***				
	(0.076)					(0.145)				
Min. wage/GDP per worker		0.098					-0.164			
		(0.243)					(0.291)			
Collective bargaining coverage			-0.357					1.584***		
			(0.385)					(0.427)		
Trade union density				-0.437					0.749**	
				(0.289)					(0.362)	
Share of unemployed receiving UI					-0.044					1.066***
					(0.190)					(0.286)
Constant	5.184**	2.051***	2.606***	2.392***	2.376***	9.400*	4.547***	5.675***	5.369***	5.673***
	(2.596)	(0.289)	(0.497)	(0.376)	(0.239)	(4.968)	(0.346)	(0.551)	(0.470)	(0.361)
R^2	0.591	0.250	0.171	0.202	0.128	0.403	0.300	0.302	0.214	0.157
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 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 7. 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 0.37 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. We are anyway interested mainly in the cross-country variation, so 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 one 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 the idiosyncratic risk of insurance. The effects for collective bargaining coverage and trade union density are quantitatively similar. However, the coefficients on recessions, crises, and multi-dimensional crises are not statistically different from those that do not control for labor market institutions (Table 2, column (4)), which implies that the long downturns after crises are not driven by labor market institutions of the affected countries.

5.3. Exchange Rate Policy

We next consider the role of exchange rate policy. A long literature points to the exchange rate a country has at the onset of a recession or crisis as well as decisions about whether to alter the exchange rate policy as being important determinants of the path of the 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.[14] We estimate the severity and duration of a labor market downturn as a function of whether it was a crisis or a multi-dimensional crisis interacted with whether the country had a fixed exchange rate.

Our results are shown in Table 8. Columns (1) and (5) 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 (6) show the corresponding results when we control for whether a country has a fixed exchange rate at the onset of the recession and interactions between having a fixed exchange rate and whether

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

Table 8: Unemployment Response to Recessions: Exchange Rate Policy

	Severity				Duration			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crisis	1.362***	1.255*	2.207**	0.653	0.941	-0.254	2.836	-1.155
	(0.424)	(0.659)	(0.897)	(0.519)	(0.782)	(1.401)	(1.811)	(1.095)
Multi-dimensional crisis	4.622***	1.330	1.145	1.580*	4.851***	1.753	0.727	3.099*
	(0.589)	(0.827)	(0.976)	(0.804)	(1.085)	(1.758)	(1.970)	(1.698)
Fixed exchange rate		-1.572***				-1.766		
		(0.565)				(1.201)		
Fixed exchange rate × Crisis		1.035				2.422		
		(0.825)				(1.755)		
Fixed exchange rate × Multi-dimensional crisis		7.098***				6.229**		
		(1.135)				(2.413)		
Always fixed			-1.153*				-1.047	
			(0.679)				(1.371)	
Always fixed × Crisis			0.148				-0.942	
			(1.110)				(2.241)	
Always fixed × Multi-dimensional crisis			7.625***				7.408***	
			(1.286)				(2.596)	
Abandon fixed			-1.064				-3.481**	
			(0.701)				(1.415)	
Abandon fixed × Crisis			-0.398				-1.277	
			(1.221)				(2.465)	
Abandon fixed × Multi-dimensional crisis			4.584*				-2.945	
			(2.555)				(5.155)	
Fixed w/ CA deficit				-0.959*				0.731
				(0.567)				(1.197)
Fixed w/ CA deficit × Crisis				2.461***				4.524**
				(0.897)				(1.893)
Fixed w/ CA deficit × Multi-dimensional crisis				7.244***				3.910
				(1.211)				(2.556)
Constant	0.420	1.993	1.484	1.379	3.000	4.766	6.481	2.269
	(2.587)	(2.335)	(2.380)	(2.342)	(4.766)	(4.963)	(4.802)	(4.944)
R^2	0.531	0.665	0.677	0.677	0.356	0.379	0.461	0.421
N	298	273	273	258	298	273	273	258
Countries	84	81	81	81	84	81	81	81
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

the recession was a crisis or a multidimensional crisis. In this case, the constant and the coefficients on crisis and multidimensional 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 (Domaç and Martinez Peria, 2003). We find the same is true for the severity of the labor market downturn. For example, countries with a fixed exchange rate during a multidimensional crisis have 7.1 percentage point larger rises in unemployment and downturns that last 6.2 quarters longer than countries with flexible exchange rates. Indeed, the coefficients on multidimensional crisis are both positive but smaller and no longer statistically significant, indicating that much of the large effects associated with multidimensional crises come from countries with fixed exchange rates.

Obstfeld and Rogoff (1995) and Kaminsky and Reinhart (1999) document that part of the reason why fixed exchange rate regimes are associated with severe downturns is that countries engage in costly actions in an attempt to defend their fixed exchange rate. Motivated by this, columns (3) and (7) divide countries with fixed exchange rates at the onset of the recession into two subgroups: those whose exchange rates remain fixed for at least two years, and those who abandon the fixed exchange rate and switch to a floating exchange rate within two years. Consistent with the intuition in the literature, countries that

defend the exchange rate have particularly severe and long labor market downturns, whereas countries that abandon the fixed exchange rate regime have shorter and less severe downturns.

Finally, Schmitt-Grohé and Uribe (2016) propose a particular mechanism where fixed exchange rates interact with free capital mobility and lead to overborrowing during booms and higher levels of unemployment during recessions. To explore this, we construct a dummy variable for countries that have both a fixed exchange rate and a current account deficit at the onset of a recession or a crisis.[15] We regress the severity and duration of the labor market downturn on this dummy and the dummy interacted with crisis and multi-dimensional crisis. The results are shown in columns (4) and (8). Again, we find that the severity and duration are worse for this subset of countries, particularly for crises and multi-dimensional crises.

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 multi-dimensional crisis, but also including interactions with whether the country had a fixed exchange rate and a current account deficit. The results, shown in Appendix B.10, show a strong gradient as before. Young and less educated workers generally face larger rises in unemployment rates during crises and particularly during multi-dimensional crises. For example, consider the extreme case of a country with an initial fixed exchange rate and a current account deficit that experiences a multi-dimensional crisis. During these events, young workers with less than a high school degree experience an increase of unemployment rates of more than 40 percentage points, while older, college-educated workers experience an increase of just 3.2 percentage points.

5.4. 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 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.

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 GCDC database, using 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 World Bank (2025). In

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

Table 9: Unemployment Response to Recessions: The Role of Inflation

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Crisis	1.362***	1.244***	1.510***	0.941	0.866	1.066
	(0.424)	(0.439)	(0.497)	(0.782)	(0.809)	(0.913)
Multi-dimensional crisis	4.622***	5.379***	6.164***	4.851***	5.919***	5.243***
	(0.589)	(0.695)	(0.884)	(1.085)	(1.279)	(1.626)
Large depreciation		0.288			1.535	
		(0.644)			(1.187)	
Large depreciation × Crisis		1.785			3.054	
		(1.380)			(2.542)	
Large depreciation × Multi-dimensional crisis		-2.380*			-3.590	
		(1.350)			(2.487)	
Δ PPI infl. > 9.8pp (90th pct)			-0.881*			-2.739***
			(0.502)			(0.923)
Δ PPI infl. > 9.8pp (90th pct) × Crisis			-0.614			-0.790
			(0.863)			(1.588)
Δ PPI infl. > 9.8pp (90th pct) × Multi-dimensional crisis			-2.329*			0.279
			(1.223)			(2.249)
Constant	0.420	0.420	0.420	3.000	3.000	3.000
	(2.587)	(2.566)	(2.514)	(4.766)	(4.727)	(4.624)
R^2	0.531	0.545	0.564	0.356	0.376	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

this case, we define high inflation as country-years above the 90th percentile of the overall distribution, which corresponds to an inflation rate of more than 9.8 percent.[16]

We then interact the severity and duration of each labor market downturn with the same constant, crisis indicator, and multi-dimensional crisis indicator, as well as interactions with whether the downturn had either a large depreciation or high inflation. Table 9 shows the results.

Columns (1) and (4) again repeat the results with no interactions with inflation, 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. These indicators are frequently negative and in several cases statistically significant. For example, the interactions suggest that either a large depreciation or a bout of high inflation reduces the severity of a multi-dimensional crisis by 2.3–2.4 percentage points. The interactions for duration are more mixed. For example, they are as likely to be positive as they are to be negative. We take away from this that there is evidence for a jobless versus wageless recovery from the severity but not the duration of recessions.

Again, we find that these results have important distributional consequences. We estimate results for the severity of the crisis for workers of different age and education levels and interactions with high depreciation rates or high inflation rates in Appendix B.10. Large deprecations or large bursts of inflation greatly mitigate the effects of multi-dimensional crises for younger and less educated workers. For example, the marginal effect of a large depreciation event on the unemployment of young workers with

[16]Results using the consumer price inflation index for each country are qualitatively consistent but somewhat smaller and not statistically significant.

less than a high school degree is a 14 percentage point reduction in the average rise in the unemployment rate; the marginal effect of a large burst of inflation on the same group of workers is a 12 percentage point reduction in the average rise in the unemployment rate. There is essentially no marginal effect for older, college-educated workers of either event. Once again, the main take-away is that both recessions and 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.

We provide four main results. 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 significant events are closely associated with a few important types of crises, notably banking panics, house price busts, and sudden stops. Third, recessions and crises affect marginal workers – younger workers, less-educated workers, and lower-earning workers – more. Fourth, we find that a number of policies and mechanisms proposed by the literature affect the severity and duration of a labor market downturn. Further, we provide new evidence that these policies and mechanisms again pass through most to marginal workers.

Our work has important implications for a number of literatures. It 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 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

Table of Contents for Appendix

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 spanning 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_XDC.

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 quartic root of the year-over-year growth rate 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.

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	5
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	8
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	321 recessions

Quarters gives the range over which aggregate unemployment rate data is 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.

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 A2: Coverage of Micro Dataset

Country	Quarters	Observations (1000s)	Recessions
Argentina	2003q3–2024q3	10403	7
Austria	2010q1–2020q3	743	2
Bolivia	2015q4–2024q4	687	1
Brazil	2002q1–2024q4	7727	4
Chile	1986q1–2024q4	6813	5
Costa Rica	2010q3–2024q4	316	2
Croatia	2010q1–2020q3	89	1
Cyprus	2005q1–2020q3	261	3
Czech Republic	2005q1–2010q3	591	1
Denmark	2007q1–2020q3	306	3
Dominican Republic	2016q1–2023q4	300	1
Ecuador	2007q2–2024q4	441	5
Estonia	2005q1–2020q3	90	2
France	2003q1–2017q3	2378	1
Georgia	2009q1–2024q3	134	1
Greece	2005q1–2018q3	1434	2
Hungary	2005q1–2020q3	1640	4
Iceland	2005q1–2020q3	67	2
India	2017q3–2024q1	2381	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	130	1
Mexico	1995q1–2024q4	20814	5
Mongolia	2019q1–2024q3	59	1
Paraguay	2010q1–2017q1	28	1
Peru	2003q1–2018q3	208	0
Philippines	1988q2–2003q1	1158	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	2008q1–2024q4	1104	4
Spain	2000q1–2020q1	7312	2
Sweden	2006q1–2020q3	1631	2
Switzerland	2010q1–2019q3	289	0
United Kingdom	1997q1–2025q1	4142	3
United States	1976q1–2025q2	8042	5
West Bank and Gaza	2000q1–2021q3	382	4
Total: 43 countries	2,654 quarters	88,345 observations	96 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 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 or after; ii) the unemployment rate is higher than any of the four following quarters. The former criteria 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 multi-dimensional 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	1.123*	0.941	0.419	2.590**	2.448	2.086
	(0.633)	(0.782)	(0.722)	(1.237)	(1.512)	(1.439)
Multi-dimensional crisis	5.698***	4.851***	2.343**	11.783***	10.967***	7.649***
	(0.933)	(1.085)	(1.071)	(1.857)	(2.180)	(2.176)
Duration, GDP			0.606***			0.950***
			(0.095)			(0.204)
Constant	5.702***	3.000	1.183	9.810***	4.000	1.150
	(0.346)	(4.766)	(4.386)	(0.672)	(8.978)	(8.449)
R^2	0.113	0.356	0.460	0.128	0.391	0.459
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 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 to 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 multi-dimensional 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 multi-dimensional 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.[17] 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,

[17]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.

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 shocks as 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 reaches into the first half of 2020.

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 four quarters before, the quarter of, or eight quarters after the onset of the recession.

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	12
Bank equity crises	40	29	12
Stock market crashes	145	76	30
House price busts	53	38	12
Sudden stops	115	82	30
Commodity import price shocks	200	13	5
Commodity export price shocks	69	22	6
Large depreciations	86	42	15
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 multi-dimensional 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	1.718**	2.416***	1.802**	0.989	1.281	0.106
	(0.846)	(0.823)	(0.756)	(1.246)	(1.385)	(1.337)
Bank equity crisis	0.113	-0.045	0.024	1.130	-1.070	-0.349
	(0.828)	(0.848)	(0.772)	(1.219)	(1.426)	(1.361)
Stock market crash	-0.060	0.240	0.069	1.236	1.470	0.785
	(0.522)	(0.558)	(0.509)	(0.769)	(0.938)	(0.902)
House price bust	1.937***	1.913***	1.687***	4.124***	3.091***	2.218**
	(0.598)	(0.648)	(0.591)	(0.880)	(1.090)	(1.050)
Sudden stop	1.066**	1.432***	1.025**	0.344	0.326	-0.097
	(0.418)	(0.429)	(0.395)	(0.616)	(0.721)	(0.690)
Commodity import price shock	1.476*	0.660	0.766	0.668	0.698	1.158
	(0.876)	(0.912)	(0.831)	(1.290)	(1.534)	(1.459)
Commodity export price shock	-0.374	0.637	0.373	-1.752	0.387	0.282
	(0.757)	(0.886)	(0.808)	(1.114)	(1.491)	(1.416)
Large depreciation	-0.071	-0.060	0.244	-0.547	-0.472	-0.386
	(0.558)	(0.605)	(0.553)	(0.821)	(1.017)	(0.966)
Sovereign debt default	0.025	-0.537	-0.120	0.523	0.277	-1.453
	(1.109)	(1.210)	(1.104)	(1.633)	(2.036)	(1.965)
COVID-19	0.027	-0.289	-1.299***	-2.588***	-3.604***	-2.794***
	(0.452)	(0.476)	(0.460)	(0.665)	(0.800)	(0.778)
Severity, GDP			0.184***			
			(0.028)			
Duration, GDP						0.483***
						(0.100)
Constant	2.095***	0.710	-0.153	6.260***	6.604	4.345
	(0.286)	(2.686)	(2.449)	(0.421)	(4.518)	(4.314)
R^2	0.129	0.529	0.611	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Banking panics, sudden stops, and house price busts stand out for having economically and statistically significant, positive effects on the severity and duration of the labor market downturn. This finding is particularly notable in column (3), where we also control for the severity of the downturn in terms of the decline in GDP per capita. In this case, these are the three shocks that have are highly economically and statistically significant. 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 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

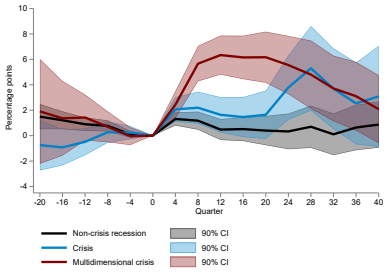
effects on labor market downturns. Sovereign defaults have large effects comparable to the other shocks that we discuss. However, we have very few such events and hence view our evidence as less reliable. Finally, COVID-19 is a clear outlier in that it is mainly associated with a large, statistically 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

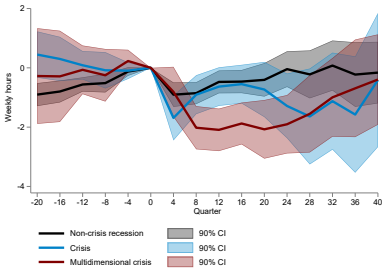
Our main results focus on the severity and the duration of the labor market downturn, both measured from the onset of the recession. This naturally raises the question of whether there are important pre-crisis trends. To study this, we use local projections to estimate the entire time path of unemployment, hours per adult, and hours per employed for a recession, crisis, and multi-dimensional 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

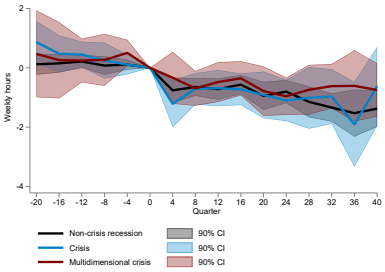
(a) Unemployment



(b) Hours per Adult



(c) Hours per Employed



In the years leading up to a non-crisis recession the unemployment rate falls by about 1 percentage point and the hours per adult rise by about an hour per week. The hours per employed are essentially flat. The results for crises and multi-dimensional 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 collects 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 are both 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 multi-dimensional 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
	(0.475)	(0.505)	(0.815)	(0.881)
Bank panic		2.037**		1.793
		(0.828)		(1.446)
Bank equity crisis		0.187		0.118
		(0.839)		(1.465)
House price bust		2.269***		4.215***
		(0.631)		(1.102)
Constant	0.420	0.420	3.000	3.000
	(2.832)	(2.679)	(4.853)	(4.677)
R^2	0.436	0.502	0.330	0.386
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

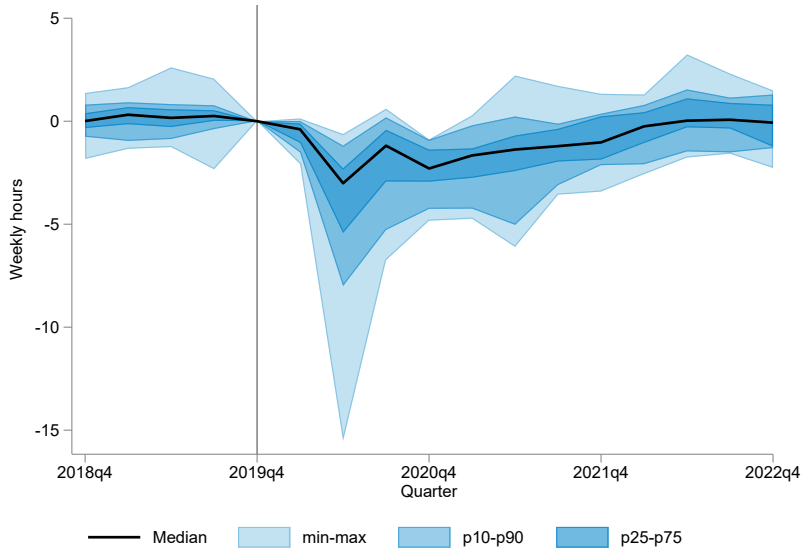
To do so, we start by regressing the severity and duration of a recession on a dummy variable for whether it was part of the Great Recession, meaning that it starts in the years 2007-2008. Columns (1) and (3) show that indeed the Great Recession was accompanied by an unusually harsh labor market downturn, 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 and generally statistically significant 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 nonresponse rates. Labor market statistics from early 2020 should be treated with caution.

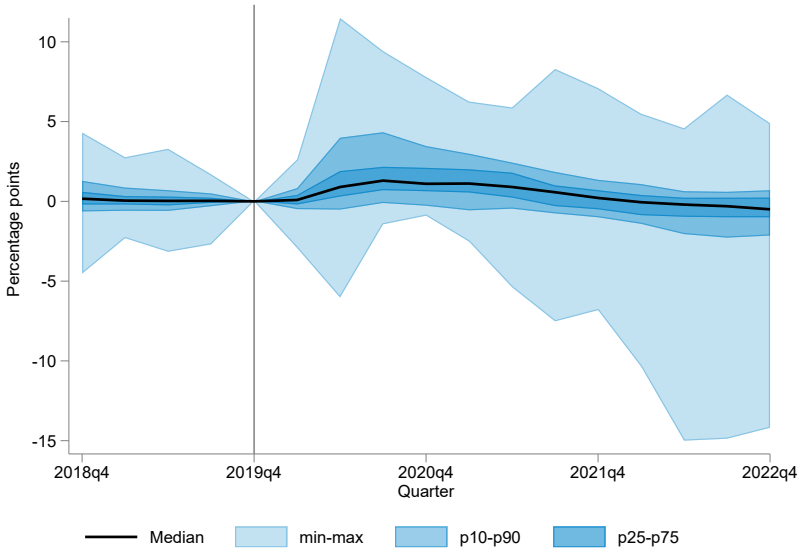
Figure B2: Effects of COVID-19 on Hours (Micro Dataset)



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 that reports statistics reports 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 COVID relief policies (Bruenig 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 policy-induced variation in these patterns, ranging from dramatic increases

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



of more than 10 percentage points to dramatic 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. Comparison of Results, Aggregate and Micro Datasets

We compare the average labor market response to recessions, crises, and multi-dimensional crises in aggregate data and our micro datasets. We estimate the severity and duration separately in each. The results are shown in Tables B5 and B6.

Table B5: 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	0.529	2.248*	1.401	2.151*
	(0.392)	(1.144)	(1.122)	(1.163)
Multi-dimensional crisis	4.306***	6.648***	5.876***	6.889***
	(0.578)	(1.245)	(1.250)	(1.296)
Constant	2.235***	2.871***	2.955***	2.968***
	(0.214)	(0.639)	(0.637)	(0.660)
R^2	0.159	0.282	0.240	0.288
N	298	76	73	73
Countries	84	37	36	36
Country FE	No	No	No	No

Standard errors 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 multi-dimensional crises in the aggregate versus micro datasets. The results are qualitatively similar, although there are some quantitatively significant differences. For example, multi-dimensional 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 73 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 multi-dimensional 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 variations in details in terms of how countries compute and report their official unemployment rate are not first-order for the study of the cyclical dynamics of labor markets.

Table B6: 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	1.123*	1.607	2.497*	1.468
	(0.633)	(1.372)	(1.317)	(1.405)
Multi-dimensional crisis	5.698***	7.105***	7.407***	7.029***
	(0.933)	(1.493)	(1.468)	(1.565)
Constant	5.702***	5.762***	5.450***	5.900***
	(0.346)	(0.766)	(0.748)	(0.797)
R^2	0.113	0.237	0.268	0.224
N	298	76	73	73
Countries	84	37	36	36
Country FE	No	No	No	No

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix B.8. Additional Results on Aggregate Consequences of Crises

In the main text we focus on the severity of labor market downturns during recessions, crises, and multi-dimensional crises measured using a wide variety of labor market indicators (Table 3). Table B7 shows the corresponding results for duration. Most variables take 3–6 quarters to reach their trough before recovery during a recession; crises and multi-dimensional crises are consistently longer.

Table B8 re-estimates the severity results while controlling for the change in GDP per capita over the intervening period. This shows that multi-dimensional crises have an effect on a wide variety of labor market indicators that extends beyond what one would expect based solely on the extent of the decline in GDP per capita.

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., 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 Palestine. 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 B9 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 (0.5 percentage points) and self-employment increases by slightly less (0.9 percentage points). We do not find any significant interaction with crises. We have no examples of countries where self-employment is important experiencing multi-dimensional 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 multi-dimensional crises in the first place. Our approach is not well-suited to estimate such an effect.

Table B7: Labor Market Outcomes During Recessions and Crises: Duration

	(1) Unemp. Rate	(2) Long-term Unemp. Rate	(3) Labor Force Part. Rate	(4) Employment-Population Ratio	(5) Hours per Person	(6) Hours per Employed	(7) Separation Rate	(8) Job-finding Rate	(9) Job-to-job Rate	(10) Mean log earnings	(11) Mean log wage
Crisis	1.607	1.020	0.406	2.123*	0.727	0.206	0.767	0.790	-0.271	1.756	-1.481
	(1.372)	(1.458)	(0.974)	(1.084)	(1.123)	(1.240)	(0.902)	(1.270)	(1.138)	(1.150)	(2.466)
Multi-dimensional crisis	7.105***	8.798***	2.522**	8.023***	6.177***	1.448	2.367**	3.457**	0.840	13.294***	3.882
	(1.493)	(1.554)	(1.079)	(1.201)	(1.244)	(1.349)	(0.998)	(1.406)	(1.202)	(2.334)	(4.763)
Constant	5.762***	6.868***	3.744***	3.977***	5.023***	5.952***	3.833***	4.810***	5.160***	3.706***	5.118***
	(0.766)	(0.827)	(0.549)	(0.611)	(0.633)	(0.692)	(0.512)	(0.721)	(0.736)	(0.757)	(1.545)
R^2	0.237	0.328	0.069	0.373	0.252	0.016	0.071	0.076	0.014	0.529	0.045
N	76	71	78	78	78	76	77	77	58	32	30
Countries	37	31	37	37	37	37	37	37	31	16	15
Country FE	No	No	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B8: Changes in Labor Market Outcomes During Recessions and Crises: Severity, Controlling for GDP

	(1) Unemp. Rate	(2) Long-term Unemp. Rate	(3) Labor Force Part. Rate	(4) Employment-Population Ratio	(5) Hours per Person	(6) Hours per Employed	(7) Separation Rate	(8) Job-finding Rate	(9) Job-to-job Rate	(10) Mean log earnings	(11) Mean log wage
Crisis	0.006	-0.005	-0.009	-0.010	-0.618	0.097	-0.002	-0.006	-0.003	0.002	0.045
	(0.011)	(0.009)	(0.013)	(0.014)	(0.837)	(0.906)	(0.005)	(0.026)	(0.009)	(0.045)	(0.036)
Multi-dimensional crisis	0.054***	0.040***	0.016	-0.037**	-0.073	1.752*	0.003	-0.059**	-0.002	0.016	0.012
	(0.012)	(0.009)	(0.014)	(0.015)	(0.902)	(0.948)	(0.005)	(0.028)	(0.010)	(0.075)	(0.058)
Severity, GDP	0.226***	0.195***	-0.141*	-0.255***	-12.934***	-7.819	0.059**	-0.102	0.038	0.058	-0.123
	(0.062)	(0.046)	(0.072)	(0.077)	(4.541)	(4.842)	(0.024)	(0.141)	(0.051)	(0.270)	(0.218)
Constant	0.014**	-0.001	-0.013	-0.012	-1.512***	-2.031***	0.006**	-0.070***	-0.017**	-0.086***	-0.049**
	(0.007)	(0.005)	(0.008)	(0.009)	(0.524)	(0.553)	(0.003)	(0.016)	(0.007)	(0.029)	(0.023)
R^2	0.395	0.455	0.087	0.250	0.139	0.074	0.095	0.081	0.011	0.004	0.056
N	76	71	78	78	78	76	77	77	58	32	30
Countries	37	31	37	37	37	37	37	37	31	16	15
Country FE	No	No	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B9: Self employment response to recessions and crises

	(1) Unemp. Rate	(2) Self Emp./Total Emp.
Crisis	0.024	-0.001
	(0.016)	(0.006)
Multi-dimensional crisis	0.064***	0.003
	(0.014)	(0.006)
High SE share, low UI cov. × Crisis	-0.002	0.004
	(0.023)	(0.010)
High SE share, low UI cov. × Multi-dimensional crisis	0.000	0.000
	(.)	(.)
High SE share, low UI cov.	-0.005	-0.005
	(0.013)	(0.006)
Constant	0.031***	-0.010***
	(0.008)	(0.003)
R^2	0.285	0.022
N	76	77
Countries	37	37
Country FE	No	No

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

Appendix B.9. 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 B10 shows corresponding results for duration. The duration of the labor market downturn is similar for workers in different demographic groups.

Table B10: 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	3.025**	1.558	3.150**	2.400*	2.357	1.825
	(1.286)	(1.675)	(1.419)	(1.395)	(1.424)	(1.263)
Multi-dimensional crisis	8.392***	7.652***	7.217***	8.233***	9.174***	4.358***
	(1.422)	(1.823)	(1.569)	(1.543)	(1.576)	(1.396)
Constant	5.475***	6.548***	5.450***	5.700***	5.293***	5.575***
	(0.743)	(0.935)	(0.819)	(0.806)	(0.816)	(0.729)
R^2	0.328	0.195	0.233	0.284	0.317	0.122
N	75	76	75	75	76	75
Countries	36	36	36	36	36	36
Country FE	No	No	No	No	No	No

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

For brevity we analyze age and education separately in the text. Table B11 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 (4.9 vs 2.1 percentage point increase in unemployment). Within the college group, young college workers are more affected by recessions than middle-aged or older college workers (5.8 versus 2.1 or 2.4 percentage point increase in unemployment).

Table B11: 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	0.031	0.040	0.034	0.017	0.009	0.021**	0.004	0.016	-0.001
	(0.025)	(0.030)	(0.026)	(0.019)	(0.019)	(0.008)	(0.025)	(0.025)	(0.008)
Multi-dimensional crisis	0.160***	0.182***	0.129***	0.135***	0.081***	0.045***	0.128***	0.100***	0.015*
	(0.028)	(0.033)	(0.029)	(0.021)	(0.021)	(0.009)	(0.028)	(0.028)	(0.009)
Constant	0.076***	0.056***	0.058***	0.049***	0.049***	0.021***	0.041***	0.028*	0.024***
	(0.015)	(0.018)	(0.015)	(0.011)	(0.011)	(0.005)	(0.014)	(0.014)	(0.005)
R^2	0.309	0.295	0.215	0.367	0.169	0.263	0.234	0.159	0.043
N	76	74	75	78	76	77	77	74	76
Countries	36	36	36	37	35	36	36	35	35
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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 multi-dimensional crises on top of the decline in output that they induce. Table B12 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 crises or multi-dimensional crises.

Table B12: 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	0.029	0.011	0.004	-0.008	0.003	0.010
	(0.020)	(0.011)	(0.010)	(0.018)	(0.013)	(0.008)
Multi-dimensional crisis	0.124***	0.064***	0.048***	0.103***	0.072***	0.014*
	(0.021)	(0.012)	(0.010)	(0.019)	(0.014)	(0.008)
Severity, GDP	0.212*	0.176***	0.199***	0.321***	0.275***	0.057
	(0.109)	(0.059)	(0.052)	(0.097)	(0.071)	(0.042)
Constant	0.032**	0.019***	0.009	0.021*	0.017**	0.022***
	(0.013)	(0.007)	(0.006)	(0.011)	(0.008)	(0.005)
R^2	0.405	0.430	0.417	0.438	0.442	0.108
N	75	76	75	75	76	75
Countries	36	36	36	36	36	36
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B13 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 11.3 percentage point rise in long-term unemployment during multi-dimensional crises, whereas workers with a college degree experience only a 3.1 percentage point rise.

Table B13: 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	0.016	0.011	0.010	0.016	0.011	0.004
	(0.014)	(0.010)	(0.008)	(0.016)	(0.013)	(0.007)
Multi-dimensional crisis	0.058***	0.046***	0.053***	0.100***	0.068***	0.023***
	(0.015)	(0.010)	(0.008)	(0.017)	(0.014)	(0.007)
Constant	0.021**	0.014**	0.007	0.013	0.016**	0.008**
	(0.008)	(0.005)	(0.005)	(0.009)	(0.008)	(0.004)
R^2	0.187	0.230	0.376	0.346	0.262	0.139
N	69	71	69	70	69	69
Countries	31	31	31	31	31	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Tables B14 and B15 decompose movements in unemployment into the underlying movements in separation and job-finding rates. Separation rates consistently rise by 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 8–10 percentage points across the board, with little gradient across age groups or education levels. During multi-dimensional 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 B14: 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	0.005	0.003	0.001	0.001	0.001	-0.001
	(0.007)	(0.004)	(0.004)	(0.007)	(0.007)	(0.003)
Multi-dimensional crisis	0.011	0.013***	0.002	0.015*	0.008	0.001
	(0.007)	(0.005)	(0.004)	(0.008)	(0.007)	(0.003)
Constant	0.018***	0.010***	0.010***	0.017***	0.015***	0.010***
	(0.004)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)
R^2	0.030	0.090	0.004	0.050	0.017	0.002
N	77	76	76	77	76	74
Countries	37	37	37	37	37	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B15: 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	-0.003	-0.040	0.019	-0.040	0.009	-0.018
	(0.025)	(0.033)	(0.041)	(0.026)	(0.029)	(0.035)
Multi-dimensional crisis	-0.081***	-0.086**	0.008	-0.050*	-0.068**	-0.101**
	(0.028)	(0.037)	(0.045)	(0.029)	(0.032)	(0.039)
Constant	-0.087***	-0.089***	-0.122***	-0.084***	-0.091***	-0.086***
	(0.014)	(0.019)	(0.023)	(0.015)	(0.016)	(0.020)
R^2	0.109	0.071	0.003	0.055	0.068	0.085
N	76	77	78	75	78	77
Countries	36	37	37	36	37	37
Country FE	No	No	No	No	No	No

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

We provide results that move beyond unemployment as well. Tables B16 and B17 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.

Table B16: 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	-0.022	-0.034**	-0.026*	-0.024	-0.023	-0.020
	(0.016)	(0.016)	(0.014)	(0.017)	(0.021)	(0.015)
Multi-dimensional crisis	-0.067***	-0.057***	-0.027*	-0.046**	-0.081***	-0.028
	(0.018)	(0.018)	(0.016)	(0.018)	(0.023)	(0.017)
Constant	-0.051***	-0.031***	-0.025***	-0.043***	-0.046***	-0.034***
	(0.009)	(0.009)	(0.008)	(0.009)	(0.012)	(0.009)
R^2	0.166	0.139	0.061	0.089	0.143	0.045
N	76	77	77	76	76	76
Countries	36	37	36	35	36	36
Country FE	No	No	No	No	No	No

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

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

Table B17: 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	-0.007	-0.031**	-0.020	-0.019	-0.000	-0.012
	(0.013)	(0.014)	(0.013)	(0.014)	(0.016)	(0.013)
Multi-dimensional crisis	-0.017	0.002	0.003	-0.005	0.023	0.009
	(0.015)	(0.015)	(0.015)	(0.015)	(0.017)	(0.015)
Constant	-0.040***	-0.018**	-0.022***	-0.033***	-0.045***	-0.024***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)
R^2	0.017	0.069	0.033	0.024	0.025	0.022
N	75	75	77	77	75	75
Countries	35	36	36	37	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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

margin effects through hourly wages. Table B18 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 more for older and more educated workers than for younger and less educated workers. Further, the differences are large: for recessions, the fall in wages is 2–3 percentage points larger for older workers as compared to younger ones, or for college-educated workers as compared to those with less than a high school degree.

Table B18: 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	-0.000	0.036	0.008	0.035	0.038	0.024
	(0.035)	(0.031)	(0.039)	(0.027)	(0.045)	(0.041)
Multi-dimensional crisis	-0.031	0.012	0.048	0.001	0.070	0.028
	(0.071)	(0.059)	(0.079)	(0.053)	(0.092)	(0.084)
Constant	-0.054**	-0.063***	-0.088***	-0.073***	-0.104***	-0.100***
	(0.024)	(0.020)	(0.026)	(0.017)	(0.030)	(0.027)
R^2	0.007	0.051	0.013	0.059	0.035	0.013
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix B.10. 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 B19 reports results on the sectoral employment-population ratio for the fifteen sectors. Table B20 shows the results for sectoral log employment.

Table B19: Sectoral transmission of crises for employment-population: severity

	Non-crisis recession	Crisis	Multi-dimensional crisis	R^2	N	Countries
All sectors	-0.027***	-0.028*	-0.048**	0.116	67	31
	(0.009)	(0.015)	(0.018)			
Agriculture, fishing, & forestry	-0.000	-0.001	-0.006**	0.063	67	31
	(0.001)	(0.002)	(0.003)			
Mining	-0.001**	0.001	0.000	0.020	67	31
	(0.000)	(0.000)	(0.001)			
Manufacturing	-0.007***	-0.006**	-0.015***	0.255	67	31
	(0.002)	(0.003)	(0.003)			
Utilities	-0.000	0.001	0.000	0.041	67	31
	(0.000)	(0.001)	(0.001)			
Construction	-0.005**	-0.004	-0.022***	0.337	67	31
	(0.002)	(0.003)	(0.004)			
Wholesale & retail trade	-0.005**	-0.004	-0.004	0.023	67	31
	(0.002)	(0.004)	(0.005)			
Hotels & restaurants	-0.003*	-0.002	0.001	0.021	65	31
	(0.001)	(0.003)	(0.003)			
Transportation, storage, & communication	-0.002	-0.002	0.005	0.059	67	31
	(0.002)	(0.003)	(0.003)			
Financial services & insurance	-0.000	-0.000	0.003	0.029	67	31
	(0.001)	(0.002)	(0.002)			
Public & defense	-0.002*	-0.001	-0.002	0.023	65	31
	(0.001)	(0.001)	(0.002)			
Real estate & business services	-0.002	-0.000	-0.003	0.020	60	31
	(0.001)	(0.002)	(0.003)			
Education	-0.000	-0.001	0.003*	0.079	65	31
	(0.001)	(0.001)	(0.002)			
Health & social work	0.001	-0.002	-0.004	0.042	65	31
	(0.001)	(0.002)	(0.003)			
Other services	-0.001	-0.003*	-0.003	0.055	65	31
	(0.001)	(0.002)	(0.002)			
Private household services	-0.001	-0.001	0.001	0.013	63	31
	(0.001)	(0.001)	(0.002)			

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

We next ask whether crises affect emerging markets differently. We divide countries 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 multi-dimensional crisis interacted with whether the country is an emerging economy. Table B21 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

Table B20: Sectoral transmission of crises for log employment: severity

	Non-crisis recession	Crisis	Multi-dimensional crisis	R^2	N	Countries
All sectors	-0.039**	-0.049	-0.078**	0.080	67	31
	(0.018)	(0.031)	(0.037)			
Agriculture, fishing, & forestry	-0.051	-0.004	-0.120*	0.048	67	31
	(0.033)	(0.057)	(0.069)			
Mining	-0.097	0.123	-0.066	0.024	67	31
	(0.072)	(0.123)	(0.150)			
Manufacturing	-0.069***	-0.078**	-0.184***	0.232	67	31
	(0.021)	(0.036)	(0.043)			
Utilities	-0.022	0.169*	0.051	0.044	67	31
	(0.058)	(0.099)	(0.120)			
Construction	-0.082**	-0.086	-0.441***	0.310	67	31
	(0.039)	(0.068)	(0.082)			
Wholesale & retail trade	-0.038*	-0.033	-0.059	0.036	67	31
	(0.020)	(0.034)	(0.041)			
Hotels & restaurants	-0.075*	-0.069	0.014	0.017	65	31
	(0.044)	(0.074)	(0.090)			
Transportation, storage, & communication	-0.043	-0.036	0.083	0.041	67	31
	(0.032)	(0.054)	(0.066)			
Financial services & insurance	0.001	-0.038	0.089	0.025	67	31
	(0.043)	(0.074)	(0.090)			
Public & defense	-0.028	-0.016	-0.047	0.022	65	31
	(0.019)	(0.033)	(0.040)			
Real estate & business services	-0.044	-0.056	-0.370*	0.050	60	31
	(0.112)	(0.180)	(0.217)			
Education	0.013	-0.055	0.024	0.053	65	31
	(0.021)	(0.036)	(0.043)			
Health & social work	0.023	-0.016	-0.068	0.017	65	31
	(0.032)	(0.055)	(0.066)			
Other services	-0.036	-0.121*	-0.077	0.057	65	31
	(0.038)	(0.064)	(0.078)			
Private household services	-0.116	0.036	0.221	0.018	63	31
	(0.105)	(0.174)	(0.210)			

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

Table B21: Unemployment Response to Recessions: Emerging Markets

	Severity		Duration	
	(1)	(2)	(3)	(4)
Crisis	1.362***	1.166**	0.941	-0.142
	(0.424)	(0.581)	(0.782)	(1.067)
Multi-dimensional crisis	4.622***	3.976***	4.851***	3.769**
	(0.589)	(0.809)	(1.085)	(1.487)
Emerging market x crisis		0.369		2.271
		(0.853)		(1.568)
Emerging market x multi-dimensional crisis		1.369		2.159
		(1.184)		(2.174)
Constant	0.420	0.420	3.000	3.000
	(2.587)	(2.591)	(4.766)	(4.760)
R^2	0.531	0.534	0.356	0.364
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

larger and more protracted labor market downturns during crises and multi-dimensional crises. The effects on crisis and multi-dimensional crisis in columns (2) and (4) are smaller than their counterparts in columns (1) and (3); the interactions are positive but not statistically significant.

Our final results show the heterogeneous impacts of policy. In the text we show that countries with fixed exchange rates and current account deficits suffer unusually long and severe labor market downturns, while countries with large depreciations or bursts of inflation have less severe downturns. Here we provide details of how these results trace through to different types of workers.

Table B22-B24 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 multi-dimensional crisis. We then include a constant and interactions for having a fixed exchange rate and initial current account deficit (Table B22); for having a large depreciation (Table B23); and for having a burst of inflation (Table B24).

These tables point to important heterogeneous effects, particularly for the interactions with multi-dimensional crisis. Table B22 shows that a multi-dimensional crisis in a country with a fixed exchange rate and an initial current account deficit is associated with a much larger rise in unemployment among young and less educated workers. Table B23 shows that a large depreciation mitigates the effects of a multi-dimensional crisis most for young and less-educated workers, while it has little effect for older and more-educated workers. Table B24 shows a similar result for a large burst of inflation.

We also investigate heterogeneous effects by initial earnings quintile. However, we have earnings data for fewer countries. We cannot estimate the effects of earnings for the interaction of fixed exchange rate and current account deficit with multi-dimensional crisis because we do not have any countries with earnings data in this group. The same is true of the interaction between a burst of inflation and multi-dimensional crisis. However, we do have cases for the interaction with a large depreciation, which we show in Table B25. We focus again on the main coefficient of interest, which is the heterogeneous effect of a large depreciation during a multi-dimensional 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. However, given the small number of countries and cases, none of these coefficients is statistically significant at conventional levels.

Table B22: Unemployment response to recessions and crises by age and education: the role of fixed exchange rates and current account deficits

	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	0.019	0.021	0.004	0.019	0.005	0.007	0.011	0.030	0.003
	(0.030)	(0.027)	(0.039)	(0.021)	(0.026)	(0.012)	(0.031)	(0.032)	(0.011)
Multi-dimensional crisis	0.092**	0.066**	0.157***	0.061**	0.035	0.023*	0.080**	0.051	0.000
	(0.036)	(0.032)	(0.047)	(0.025)	(0.031)	(0.014)	(0.037)	(0.038)	(0.013)
Fixed w/ CA deficit	0.008	-0.013	0.004	0.006	0.017	-0.001	0.005	0.006	0.013
	(0.025)	(0.023)	(0.033)	(0.017)	(0.022)	(0.010)	(0.026)	(0.027)	(0.009)
Fixed w/ CA deficit × Crisis	0.034	0.038	0.069	-0.011	0.002	0.030*	-0.012	-0.031	-0.008
	(0.044)	(0.039)	(0.057)	(0.030)	(0.038)	(0.017)	(0.045)	(0.046)	(0.015)
Fixed w/ CA deficit × Multi-dimensional crisis	0.247***	0.231***	-0.016	0.222***	0.143***	0.049**	0.248***	0.109*	0.060***
	(0.056)	(0.050)	(0.073)	(0.038)	(0.048)	(0.021)	(0.057)	(0.058)	(0.020)
Constant	0.074***	0.066***	0.059**	0.051***	0.046***	0.022***	0.038**	0.027	0.019***
	(0.018)	(0.016)	(0.023)	(0.012)	(0.015)	(0.007)	(0.018)	(0.019)	(0.006)
R^2	0.552	0.537	0.250	0.639	0.332	0.329	0.524	0.214	0.301
N	67	65	66	68	66	67	67	65	66
Countries	32	32	32	33	31	32	32	31	31
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B23: 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	0.021	0.031	0.029	0.012	-0.000	0.019**	-0.006	0.008	-0.003
	(0.026)	(0.032)	(0.028)	(0.019)	(0.020)	(0.009)	(0.026)	(0.027)	(0.009)
Multi-dimensional crisis	0.186***	0.208***	0.093***	0.158***	0.088***	0.049***	0.152***	0.119***	0.013
	(0.030)	(0.037)	(0.032)	(0.022)	(0.023)	(0.010)	(0.030)	(0.031)	(0.010)
Large depreciation	-0.035	-0.029	-0.035	-0.014	-0.041	-0.015	-0.036	-0.021	-0.018
	(0.032)	(0.040)	(0.034)	(0.024)	(0.025)	(0.011)	(0.032)	(0.033)	(0.011)
Large depreciation × Crisis	0.055	0.040	-0.002	0.030	0.033	-0.003	0.054	0.047	0.002
	(0.074)	(0.090)	(0.078)	(0.055)	(0.057)	(0.024)	(0.074)	(0.074)	(0.024)
Large depreciation × Multi-dimensional crisis	-0.138**	-0.137*	0.175**	-0.118**	-0.045	-0.023	-0.126*	-0.102	0.008
	(0.066)	(0.080)	(0.070)	(0.049)	(0.051)	(0.022)	(0.066)	(0.066)	(0.022)
Constant	0.085***	0.063***	0.067***	0.052***	0.059***	0.024***	0.049***	0.033**	0.028***
	(0.016)	(0.020)	(0.017)	(0.011)	(0.012)	(0.005)	(0.016)	(0.017)	(0.005)
R^2	0.399	0.354	0.284	0.445	0.241	0.325	0.323	0.217	0.088
N	76	74	75	78	76	77	77	74	76
Countries	36	36	36	37	35	36	36	35	35
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 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 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	0.040	0.045	0.041	0.006	0.012	0.025**	0.000	-0.003	-0.002
	(0.030)	(0.037)	(0.032)	(0.022)	(0.023)	(0.010)	(0.029)	(0.030)	(0.010)
Multi-dimensional crisis	0.230***	0.199***	0.127***	0.176***	0.128***	0.052***	0.203***	0.097**	0.014
	(0.041)	(0.051)	(0.044)	(0.030)	(0.031)	(0.013)	(0.040)	(0.041)	(0.014)
Δ producer price infl. > 9.8pp (90th pct)	0.014	-0.000	0.003	-0.014	0.003	-0.006	-0.012	-0.049	0.001
	(0.031)	(0.039)	(0.034)	(0.023)	(0.024)	(0.010)	(0.030)	(0.032)	(0.010)
Δ producer price infl. > 9.8pp (90th pct) × Crisis	-0.028	-0.019	-0.021	0.034	-0.010	-0.014	0.012	0.066	0.005
	(0.055)	(0.067)	(0.059)	(0.040)	(0.042)	(0.018)	(0.053)	(0.055)	(0.018)
Δ producer price infl. > 9.8pp (90th pct) × Multi-dimensional crisis	-0.124**	-0.028	0.002	-0.062	-0.079*	-0.009	-0.121**	0.031	0.002
	(0.058)	(0.071)	(0.062)	(0.042)	(0.044)	(0.019)	(0.056)	(0.058)	(0.019)
Constant	0.072***	0.056**	0.057***	0.053***	0.048***	0.022***	0.044***	0.042**	0.024***
	(0.017)	(0.022)	(0.019)	(0.012)	(0.013)	(0.006)	(0.017)	(0.017)	(0.006)
R^2	0.360	0.299	0.216	0.410	0.217	0.295	0.312	0.190	0.046
N	76	74	75	78	76	77	77	74	76
Countries	36	36	36	37	35	36	36	35	35
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 in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B25: 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	0.007	0.005	0.001	-0.007	-0.007*
	(0.011)	(0.010)	(0.007)	(0.005)	(0.004)
Multi-dimensional crisis	0.026	0.017	0.003	0.007	-0.007
	(0.031)	(0.028)	(0.020)	(0.014)	(0.012)
Large depreciation	-0.005	-0.006	-0.005	-0.011*	-0.007
	(0.013)	(0.012)	(0.008)	(0.006)	(0.005)
Large depreciation × Crisis	0.033	0.006	0.011	0.013	0.013
	(0.034)	(0.031)	(0.022)	(0.015)	(0.013)
Large depreciation × Multi-dimensional crisis	-0.028	-0.013	0.005	-0.005	0.006
	(0.045)	(0.041)	(0.029)	(0.020)	(0.018)
Constant	0.016**	0.016**	0.012***	0.016***	0.012***
	(0.007)	(0.006)	(0.004)	(0.003)	(0.003)
R^2	0.070	0.031	0.017	0.116	0.088
N	44	44	45	44	46
Countries	23	23	23	23	23
Country FE	No	No	No	No	No

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

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