Labor Market Anatomy of a Macroeconomic Crisis*

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Abstract

Labor markets are the central mechanism for passing aggregate shocks to the idiosyncratic earnings of households and consequently for determining their welfare costs. This paper uses a combination of aggregate and micro data covering labor markets from dozens of countries and hundreds of recessions to document three new findings about this mechanism. First, the distribution of labor market responses to recessions includes a tail of events that are much longer and more severe than is typically studied in the literature. Second, these events tend to be associated with macroeconomic crises, notably house price busts, commodity price shocks, and systemic financial crises. Third, the microdata show that macroeconomic crises are broad-based across sectors, involve spikes in separation rates and job-finding rates, and have stronger effects for marginally attached workers, including the young, less educated, and workers with low job tenure.

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1 Introduction

How large are the welfare costs of business cycles? In an influential article, Lucas (1987) showed that if markets are complete, these costs are governed by fluctuations in consumption per capita. These fluctuations turn out to be small empirically, which led him to conclude that so, too, are the welfare costs. Subsequent work showed that in models with incomplete markets, it is the extent of uninsurable idiosyncratic risk that matters for welfare costs and that this risk need not be correlated with aggregate risk (Atkeson and Phelan, 1994). The cost of business cycles then rests on the extent to which aggregate fluctuations are passed through to idiosyncratic risk via the labor market. Empirically, recessions are times when labor market risk rises, for example via unemployment, which points to a larger welfare cost of cycles (Storesletten et al., 2001; Krusell et al., 2009).

This paper builds on this insight by leveraging new data to provide three findings that all point to a yet larger welfare cost of cycles. First, we find that the distribution of labor market responses to recessions includes tail events that are much longer and more severe than has been previously documented. Second, we show these events are associated with macroeconomic crises. Financial crises, house price busts, and commodity price shocks stand out for predicting longer or more severe effects on labor markets. Third, we delve into the anatomy of crises, and show that marginal workers – who likely have lower consumption levels and assets – are disproportionately affected.

The starting point for our work is two new data sets that we construct and use to document these facts. First, we construct a data set consisting of estimates of standard aggregate labor market statistics such as the unemployment rate for all countries and years that report them at a quarterly frequency. The main advantage of this data set is its scope: it covers 57 countries for an average of 28 years and altogether spans 292 recessions. This large scope is central to our first contribution, which is to give a better sense of the distribution of possible labor market outcomes following a recession. By contrast, the existing literature that quantifies the welfare costs of recessions via uninsurable idiosyncratic risk focuses on the United States.

Our main finding is that the distribution of labor market responses is much broader than what the previous literature found. We focus on the tail of negative events given its importance in determining the welfare cost of business cycles. We find that in the decile of countries most strongly affected, the unemployment rate rises by at least 7 percentage points from peak to trough, with a maximum of nearly 25 percentage points. The

duration of the labor market impact from peak to trough among the decile of countries most affected is at least four years, with a maximum of 27 quarters. Both figures are far larger than what was observed in the literature.

Our aggregate data set is also central for our second contribution, which is to explore the determinants of the severity of the labor market response to recessions. A natural candidate explanation is that these severe recessions occur as part of broader macroeconomic crises, such as financial crises, currency crises, or debt defaults. However, most types of macroeconomic crises are rare, which makes it challenging to estimate whether they are associated with differential labor market impacts using the data for one or even a handful of countries.

We estimate the effect of seven different types of crisis events on the severity, length, and time path of unemployment. Several stand out as Financial crises – particularly systemic financial crises – are associated with much more severe labor market downturns, with unemployment rates rising by 2.5 percentage points more than the average non-crisis recession. House price busts are yet more severe, with unemployment rates rising by 3.6 percentage points more than the average non-crisis recession. Finally, stock market crashes are associated with more prolonged downturns that last two quarters longer than non-crisis recessions.

In principle, these effects could reflect that such shocks systematically strike different types of countries. We show that broadly similar results obtain if we control for country fixed effects, which is useful for controlling for a host of persistent country-level policies such as labor market institutions. We also explore controlling directly for policies that change over time, such as exchange rate policies, and find broadly similar results. To some extent macroeconomic crises have larger labor market effects simply because they are more severe recessions. Nonetheless, we also find that macroeconomic crises are correlated with the duration and severity of the labor market downturn even after controlling for the duration or severity of the recession itself. These findings show that macroeconomic crises are likely to have more severe effects for welfare than GDP measures suggest.

Our third contribution is to delve into the anatomy of a macroeconomic crisis and how it generates such large and durable effects on labor markets. Specifically, we turn our attention to two questions: how do macroeconomic crises affect labor markets? And who is affected?

Aggregate data cannot be used to answer these questions. Instead we turn to a second data set consisting entirely of harmonized microdata from rotating panel labor

force surveys. We previously built and used this data set to study differences in labor market outcomes across development levels in Donovan et al. (2022). Although it has less coverage than the aggregate data set, it still spans 38 countries and 124 recessions. In other ways it is much more detailed: it covers 73 million observations, where each observation is a person matched for two consecutive quarters. The short panel allows us to measure labor market flows, such as job-finding or separation rates. Additionally, the data include information on a worker's demographics, employer, and job characteristics.

With this database we uncover several important findings about how macroeconomic crises affect labor markets and who they affect. First, we show that while long-term unemployment (spanning a year or more) plays a negligible role in typical recessions, it rises by as much as four percentage points in a macroeconomic crises. We view this as pointing to a particularly severe form of labor market risk. Second, we use the information on labor market flows to show that both rising separation rates and falling job-finding rates contribute to rising unemployment in roughly equal proportions. They change particularly sharply during house price busts but also recover more quickly, consistent with our aggregate results. For financial crises they both deteriorate and recover much more slowly. Third, we consider whether some sectors are affected more quickly or to a greater extent. In most cases we find that macroeconomic crises are associated with broad based deteriorations of labor market outcomes.

Finally, we show that marginal workers are most affected by recessions and especially by macroeconomic crises. We disaggregate labor market outcomes by age, education, and occupation. Young or old workers, less educated workers, and workers in low-skilled occupations have larger rises in unemployment rates. The gap between them and other workers is present in all recessions but larger during macroeconomic crises. For example, unemployment rates grow by 1 percentage point more for young than middle-aged workers during a typical recession, but by 5 percentage points more during a financial crisis.

Returning to the question we opened with, all three of these margins point to larger welfare costs of business cycles, especially those associated with macroeconomic crises. The logic is straightforward. We know from the literature that uninsurable idiosyncratic risk determines the cost of cycles. Our data show that recessions can be associated with more such risk than the previous literature had found; that this risk is associated particularly with macroeoconomic crises; and that in these crises, it is the marginal workers, who likely already have lower consumption and savings on average, that are most affected.

These findings may have additional implications. Most directly, the welfare costs of macroeconomic crises are an important ingredient in cost-benefit calculations for policies that seek to mitigate or prevent crises, such as macroprodential or housing regulatory policy. 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., 2021; Hall and Kudlyak, 2021).

2 Data

Our analysis of the labor market response to recessions rests on two different samples that fill distinct, complementary roles. Our first sample consists of aggregate statistics published by governments or national statistical agencies. This data has the advantage of being widely available and so allows us to have the broadest possible coverage across countries and recessions. On the other hand, aggregate data is of limited value when delving into the anatomy of how macroeconomic crises affect labor markets and who they affect. We complement this data set with microdata from labor market surveys from a subset of countries and years. These data allow us to investigate the anatomy of a labor market crisis. We now discuss each in turn.

2.1 Aggregate Data Set

Our aggregate data sample consists of the official quarterly series for the unemployment rate and employment-population ratio for all countries and years for which we have been able to collect this data. By official, we mean a series produced and reported by a national statistical agency on the basis of a regular labor force survey. We focus on the aggregate series for all adults, with a preference for seasonally adjusted measures. We also collect and include related measures, such as the unemployment rate for 15–64 year olds or series that have not been seasonally adjusted, if our preferred measure is not available. We focus on quarterly series because we want high frequency data but monthly unemployment rates are not widely available.

The resulting data set consists of an unbalanced panel covering 57 countries. We merge on quarterly real GDP per capita, also from each country's national accounts. We start by defining a recession consistently in all countries as any period of two or more

consecutive quarters of falling real GDP per capita. 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; we further combine recessions that are separated by only a single quarter of real GDP per capita growth into a single recession. Note that this definition differs from the officially defined recessions in the United States; for example, by our measure there was no recession in 2001. In total, our aggregate data sample covers 292 recessions. See Appendix A for details on the coverage in terms of years and recessions by country.

The main advantage of the aggregate data set is its broad coverage. This is an important advantage for characterizing the distribution of labor market responses to recessions. It is particularly useful for investigating the labor market response to various types of macroeconomic crises given that many of these crises are rare. However, the aggregate data set has two important disadvantages. First, it relies on officially reported statistics that are not fully comparable across countries. For example, countries focus on different age ranges and adopt slightly different definitions of key concepts such as unemployment when producing their official statistics.[1] Second, 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 data set consisting of harmonized microdata from a subset of countries to overcome each of these disadvantages of the aggregate data.

2.2 Micro Data Set

Our second data set consists of the microdata from rotating panel labor force surveys from 38 countries around the world. This sample builds on work we previously devoted to collecting and harmonizing data from as many countries as possible around the world in order to study how labor market dynamics, such as labor market flows or the functioning of the job ladder, vary with development (Donovan et al., 2022). Here we build on the subset of countries with data spanning at least 24 quarters to study how labor markets respond to recessions and particularly to macroeconomic crises. We overview some key features of the database and the novel features important for our cyclical analyses here; a more extensive description, analysis, and comparison to alternative sources is available

[1] 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.

in Donovan et al. (2022) or at the companion website, https://www.lfsdata.com/.

In constructing this data set, we focus on the subset of countries that have three features. First, they use a rotating panel design, meaning that they track the same household for multiple periods. Second, this design allows households to be tracked across two consecutive quarters, which allows for the greatest comparable set of countries. Third, they make available to researchers the identifiers needed to identify people consistently across quarters. With this design and information we can track workers and construct labor market flows, which play an important role in understanding the role of job-finding and separation for transmitting aggregate shocks to individual workers and households.

We match workers across quarters and validate when possible using the standard best practice in the literature (Madrian and Lefgren, 2000). 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.

We harmonize key variables to be consistent across countries, including labor force status, demographics, education, employer characteristics, and wages. Critically, we re-define labor force status consistently across countries so that employment (wage or self-employment), unemployment, and inactivity are all closely aligned. For example, 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 month; and iii) they are available to start a job.

The matched sample allows us to construct labor market flows, which are generally the average rate of transitions between labor force statuses across quarters. For example, the job-finding rate is the probability that a person who is unemployed in their first quarter in the sample is employed in the second.

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

We merge on the same measure of real GDP per capita and define recessions in the same way as we did for the aggregate data sample. Doing so allows us to compare the behavior of labor markets in aggregate and micro data after the same recessions. More

importantly, it means that we can study the anatomy of the same shocks in terms of labor market flows, sectoral changes, and types of workers affected. We begin our analysis with the aggregate data in the next section.

3 Recessions and Aggregate Labor Market Outcomes

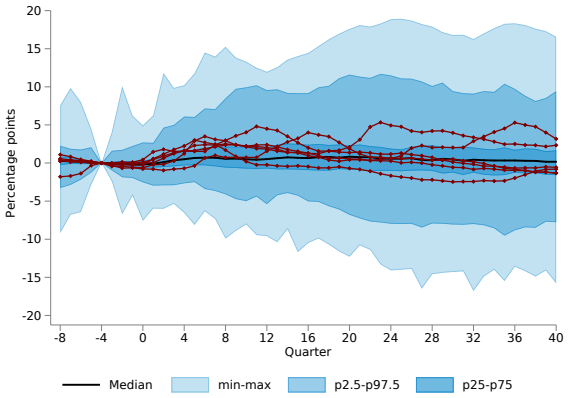
Our first contribution is to characterize the distribution of labor market outcomes across a large number of recessions. Our starting point is the literature that examines the welfare costs of business cycles with uninsurable idiosyncratic risk (Storesletten et al., 2001; Krusell et al., 2009). These papers show that in such models, labor market risk – which is typically equated with unemployment risk – substantially increases the welfare costs of business cycles. In practice, papers in this literature typically used pre-2005 data from the United States for their quantitative implementation. Our main finding relative to this literature is that this set of recessions is unusually mild, both as compared to subsequent U.S. recessions (Great Recession, COVID) and the broader international set of recessions.

Our goal for this section is to develop the broadest set of facts possible. Breadth is in itself an advantage when characterizing the distribution of possible labor market outcomes from recessions. It is also useful for the next section, when we investigate what factors correlate with the severity of a recession; some potential correlates are rare and hence a large sample is useful. To this end, we use the aggregate data set and focus on the most widely used measure of labor market performance, which is the aggregate unemployment rate.

The facts of interest concern the path of labor market outcomes during recessions. For every recession covered by our data set, we set date $t = 0$ 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 extract the data for the unemployment rate for the period spanning as long as two years before to ten years after, $t \in [-8, 40]$. We require the data cover at least $t \in [-4, 4]$, but data may otherwise be missing. For example, recessions in recent years do not yet have ten years of subsequent data. Note that at this point the period around a given recession may include additional recessions, and a given quarter of data may be included multiple times if it falls in the relevant range for more than one recession. Finally, throughout the paper we normalize labor market indicators by their prior level. We choose the value at at $t = -4$ rather than $t = 0$ because many labor market indicators lead the cycle.

Figure 1: Change in unemployment and GDP per capita around recessions

(a) Unemployment Rate



(b) GDP per capita

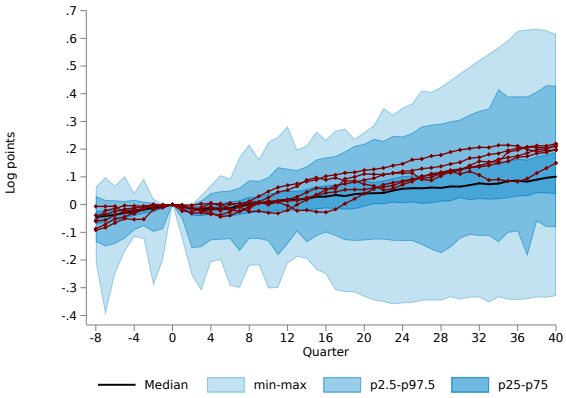


Figure 1 shows the resulting "raw" data. The black line shows the median path for unemployment across our entire sample of 292 recessions, while the blue shaded regions show percentile ranges, with lighter shaded regions corresponding to wider ranges. The quartiles are calculated separately for each date, so that the recession that contributes the median response at $t = 8$ quarters since the onset of the recession may not be the same as the recession that contributes the median response at $t = 9$. The first main feature of this figure is that the range of unemployment responses to recessions is wide. While the median and interquartile range show the expected response of a small, short rise in unemployment followed by a gradual recovery, there is a substantial tail of events with larger, longer rises in unemployment – up to 15–20 percentage point rises lasting years.

The second main pattern of interest is that these results are different from what the previous literature studied. We have included in red the paths of unemployment around recessions from the pre-2005 United States. These recessions were generally mild, with unemployment rising by at most 5 percentage points. They did not capture the most adverse labor market outcomes, such as the 10 percentage point rise associated with a two standard deviation shock. Thus, the literature that investigated the welfare costs of business cycles in models with uninsurable idiosyncratic risk understated the tail risk of negative labor market events. Including the last two recessions in the United States would alleviate some, but not all, of this gap; the most extreme increases in the unemployment rate and declines in the employment-population ratio are outside the United States.

Figure 1b shows the same figure for real GDP per capita, with the only difference that

we compute changes in GDP per capita relative to $t = 0$, as is the convention throughout the literature. This figure makes clear that the main reason that U.S. unemployment rises have been less severe is that U.S. has milder recessions in terms of the decline in output.

The breadth of our aggregate data set (292 recessions) implies that Figure 1 loses some detail on the paths of recessions. As a complement, we summarize each recession by two numbers that are easy to compare across recessions. For each recession, we compute the first period after $t = 0$ that the unemployment rate declines, which we date as the end of the labor market downturn. We then compute the *duration* of the recession in the labor market, which is the number of quarters for the labor market recovery to begin, and the *severity* of the recession for the labor market, which is the total change in the unemployment rate between $t = -4$ and the end of the recession.

Figure 2: Distribution of Severity of Recessions

(a) Duration of Recession

(b) Change in Unemployment Rate

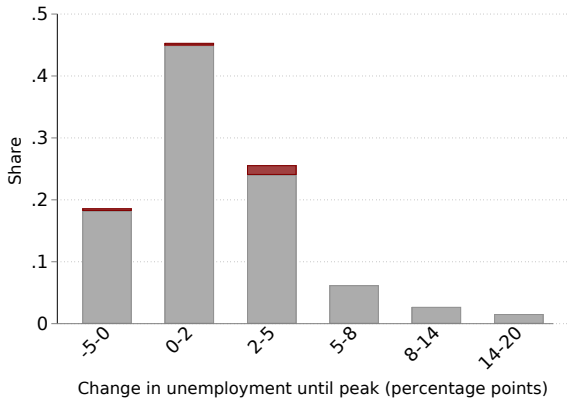


Figure 2 plots the histograms of distribution of each of these two metrics for our sample of recessions. The overall bars show the distribution across all recessions; the red portion of the bar shows the distribution for the pre-2005 United States. Again, the same two results are evident. Both distributions are skewed and have a long right tail, indicating a chance of a severe recession in terms of the severity or duration of labor market impacts. Prior to the Great Recession, the United States had short, mild recessions that missed the tail of possible outcomes. The most severe labor market recession in the United States had a duration and severity less than one-fourth that of the most severe recession in the overall sample.

4 The Determinants of Macroeconomic Crises

Our first contribution was to document that recessions sometimes induce severe contractions in labor markets and that the previous literature understated the frequency and severity of these events. In this section we turn to our second contribution, which is to show that the data point to several factors that are associated with severe, durable deteriorations of labor market outcomes. To do so, we treat severity and duration of labor market declines as dependent variables and ask what factors can help predict them.

Our primary focus is on aggregate shocks that accompany and may help drive or exacerbate the recession, such as stock market crashes or financial crises. We also explore country policies, such as exchange rate policies, both as direct contributors and because they may interact with other factors. Finally, we explore whether the extent of the decline in GDP can be used as a sufficient statistic for the impact of a recession on the labor market. We begin by describing the explanatory factors that we explore.

4.1 Data on Characteristics of Shocks and Countries

We explore a number of measures of the incidence of shocks that may affect a country. These shocks may help create the recession, amplify an existing recession, or both; our data are not suited for identifying the various channels. Instead, our goal is to understand how different types of shocks may affect the passthrough of a recession to individual workers and who is affected.

Our starting point is the Global Crises Data by Country (GCDC) database.[2] The GCDC database identifies for every country-year which of a number of possible crisis events a country might be experiencing. We focus on five types of crises. Banking crises are identified as events where a country experiences bank runs or bailouts of financial institutions; a banking crisis that affects a significant share of the financial sector is identified separately as being a systemic banking crisis. A currency crisis is a depreciation of the currency by greater than 15 percent. A stock market crash is defined following Barro and Ursúa (2017) as "cumulated multi-year real returns of -25 percent or less." Finally, a debt crisis is when the sovereign fails to pay principal or interest on the specified date or repays on a less favorable schedule than initially specified.[3]

[2]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.

[3]The database distinguishes between ordinary banking crises and more severe, systemic banking crises

The GCDC database identifies the incidence of these events at a country-year level. For each recession in our database, we consider the period $[-2, 4]$, that is, two quarters before to four quarters after the onset of the recession. If that period includes one of these crisis events, then we consider the recession to be a part of the corresponding macroeconomic crisis.

We add to this by exploring two additional shocks that have received attention in the literature. First, we explore import and export commodity price shocks using data from Gruss and Kebhaj (2019). Their data provides 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). We associate a recession with a commodity price shock if there was such a movement in the year before the start of the recession.

Second, we explore shocks to house prices, with a focus on house price busts. Data come from the Organisation for Economic Co-operation and Development (OECD) Analytical House Price Indicators.[4] We define a house price bust as when the 4-quarter log change in the house price index is below the 5th percentile of the overall distribution (0.10 log points). We associate a recession with a house price bust if there was such a bust from one year before to two years after start of the recession.

It is important to note that these crisis indicators are neither exhaustive nor exclusive. Most recessions are characterized by no macroeconomic crises – we call such recessions typical. At the same time, some recessions are characterized by multiple macroeconomic crises. Our estimation results control for this overlap.

We also consider whether countries and their policies can affect the severity of the impacts on labor markets during a recession. The most straightforward approach is to think of the country itself as a driving force or confounding factor. Our preferred results control for country fixed effects to help control for such factors. We also estimate the effects of exchange rate policies, which are plausibly important and also vary over time within countries. Our measures draw on Reinhart and Rogoff (2004), Ilzetzki et al. (2019), and Ilzetzki et al. (2022). They categorize each country-year into one of six exchange

as well as between domestic and external debt crises. In each case we have too few episodes to estimate the labor market response separately and so pool them.

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

rate arrangements. To insure sufficient sample size for comparison we aggregate these into two groups that approximate the classic fixed and floating exchange rate regimes.[5]

4.2 Empirical Determinants of Crises

In this section we explore the factors that predict the severity of the labor market effects of a recession, with a particular interest on understanding what factors are associated with macroeconomic crises that have long, sustained effects on labor market outcomes. We use two approaches. For the first, we extract from each recession the two statistics we plotted in Figure 2, the duration and severity of the crisis.

Table 1: Unemployment response to recessions: severity and duration

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Systemic financial crisis	2.031**	2.595***	1.707**	1.201	1.477	0.958
	(0.810)	(0.834)	(0.768)	(1.521)	(1.676)	(1.506)
Non-systemic financial crisis	2.079**	0.817	1.173	3.223*	0.567	0.075
	(0.993)	(1.088)	(0.988)	(1.867)	(2.201)	(1.977)
Stock market crash	0.158	1.149**	1.015**	1.959**	2.931***	1.087
	(0.472)	(0.499)	(0.453)	(0.879)	(0.998)	(0.930)
Currency crisis	0.137	0.211	0.696	0.241	1.127	1.512
	(0.520)	(0.532)	(0.487)	(0.955)	(1.058)	(0.951)
Debt default	-0.524	-0.029	1.374	-0.195	1.229	1.222
	(2.103)	(2.092)	(1.908)	(3.960)	(4.239)	(3.806)
House price depreciation shock	3.636***	2.845***	2.299***	0.423	0.931	0.758
	(0.890)	(0.939)	(0.855)	(1.676)	(1.902)	(1.708)
Commodity import price shock	-0.705	-1.473	-1.108	-0.415	-1.288	-1.751
	(0.907)	(0.962)	(0.874)	(1.708)	(1.921)	(1.725)
Commodity export price shock	1.692**	1.391	0.721	-1.613	-1.973	-2.164
	(0.847)	(0.981)	(0.895)	(1.594)	(1.972)	(1.771)
GDP recession measure			19.940***			0.805***
			(2.926)			(0.109)
Constant	1.443***	-0.950	-2.321	5.382***	4.000	1.988
	(0.220)	(1.876)	(1.713)	(0.404)	(3.803)	(3.426)
R^2	0.132	0.423	0.528	0.063	0.270	0.414
N	275	275	275	287	287	287
Countries	57	57	57	57	57	57
Country FE	No	Yes	Yes	No	Yes	Yes

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

We regress each of these characteristics on our measures of the incidence of shocks as well as controls for countries, regions, and policies. Table 1 shows our results on the determinants of duration. Columns (1) and (4) show the simplest result, where we relate

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

macroeconomic crises to the duration and severity of a recession without any control variables. Recall that most recessions are not associated with any macroeconomic crisis. The constant captures the labor market effects of such recessions: unemployment rises by 1.4 percentage points over the course of 5.4 quarters before beginning to decline, on average. The coefficients on the macroeconomic crises in these columns then give the additional severity and duration of a recession containing each crisis event. Financial crises and stock market crashes last statistically significantly longer than a non-crisis recession, while unemployment rises by a statistically significantly larger amount during system and banking crises, house price busts, and commodity export price shocks. The importance of financial crises, particularly systemic ones, is consistent with previous work on their effect on the overall economy (Reinhart and Rogoff, 2014). On the other hand, our finding suggest that some crises, such as currency crises or debt defaults, do not have a large or statistically significant effect on labor market outcomes.

In principle these effects could reflect that macroeconomic crises systematically affect countries with policies or institutions that lead them to have more or less severe recessions. To help control for such differences, in columns (2) and (5) we include country fixed effects in the estimation, taking advantage of the fact that our data cover multiple recessions for most countries. The estimates are overall similar to those shown in columns (1) and (4).

Finally, in columns (3) and (6) we control for the decline of GDP in each recession. When studying the severity of the effects in the labor market (cumulative rise in the unemployment rate) we control for the cumulative decline in log GDP per capita from peak to trough. When studying the duration of the downturn in the labor market, we control for the duration of the decline in real GDP per capita. This specification allows us to address whether macroeconomic crises operate solely through generating a large decline in overall economic activity or whether they have additional effects. The coefficients on the GDP measures are statistically and economically significant: a one log point decline in GDP is associated with a 0.2 percentage point rise in unemployment rates, while one additional quarter of falling GDP per capita is associated with 0.8 additional quarters of rising unemployment. Still we can see that even after controlling for these effects, we can see that several crises stand out as having sizable impacts mostly in terms of the severity of their labor market impact. Stock market crashes, systemic financial crises, and house price busts have statistically significantly larger rises of unemployment of 1.0–2.3 percentage points. Put differently, focusing on the extent of the decline in output may

understate the welfare impact of these shocks.[6]

Table 2: Unemployment response to recessions: severity and duration

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Systemic financial crisis	2.649***	2.487***	0.312	1.468	1.013	0.808
	(0.840)	(0.849)	(1.608)	(1.702)	(1.713)	(3.300)
Non-systemic financial crisis	0.679	0.596	0.243	0.510	0.278	0.390
	(1.096)	(1.098)	(1.631)	(2.237)	(2.233)	(3.414)
Stock market crash	1.153**	0.952*	1.277*	2.929***	2.936***	3.699**
	(0.503)	(0.549)	(0.748)	(1.015)	(1.091)	(1.547)
Currency crisis	0.123	0.055	-0.819	1.148	1.223	1.881
	(0.534)	(0.541)	(0.787)	(1.075)	(1.089)	(1.639)
House price depreciation shock	2.634***	2.442**	1.883	0.728	0.622	2.935
	(0.961)	(0.979)	(1.808)	(1.966)	(1.989)	(3.772)
Commodity import price shock	-1.593	-2.080*	3.735	-0.660	-1.180	-3.096
	(1.059)	(1.123)	(2.400)	(2.155)	(2.269)	(5.028)
Commodity export price shock	1.365	0.901	0.525	-2.008	-2.547	-6.480
	(0.990)	(1.051)	(2.060)	(2.006)	(2.113)	(4.313)
Fixed exchange rate		-0.976	-1.456*		-2.850*	-1.841
		(0.785)	(0.828)		(1.532)	(1.639)
Fixed, any crisis		0.809			0.728	
		(0.676)			(1.346)	
Fixed, systemic financial crisis			3.375*			0.237
			(1.970)			(4.065)
Fixed, non-systemic financial crisis			0.766			-0.373
			(2.207)			(4.623)
Fixed, stock market crash			-0.048			-0.920
			(1.023)			(2.118)
Fixed, currency crisis			1.882*			-1.076
			(1.108)			(2.295)
Fixed, housing price shock			0.939			-3.020
			(2.151)			(4.484)
Fixed, import price shock			-6.903**			2.967
			(2.668)			(5.589)
Fixed, export price shock			0.873			5.554
			(2.348)			(4.910)
Constant	-0.950	0.026	0.506	4.000	6.850*	5.841
	(1.878)	(2.036)	(2.020)	(3.846)	(4.125)	(4.198)
R^2	0.428	0.434	0.471	0.264	0.277	0.284
N	267	267	267	279	279	279
Countries	57	57	57	57	57	57
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

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

We next investigate the importance of a critical policy choice for these countries, which is their exchange rate regime. Table 2 shows the interaction between recession severity and fixed versus flexible exchange rates for the severity and duration of a recession. Columns (1) and (4) repeat the results of columns (2) and (5) in Table 1 with

[6]In Table B1 in the Appendix we show that these results are not purely driven by the Great Recession.

country fixed effects. In columns (2) and (5) we add to this specification an indicator for whether a country had fixed exchange rates (instead of flexible exchange rates) and an interaction between having fixed exchange rates and any of the macroeconomic crises. This specification includes country fixed effects, so the effect of exchange rate regime is identified off of countries who experience recessions under different regimes. The main result is that countries with fixed exchange rates tend to have shorter and milder recessions, with unemployment rising by about one percentage point less and the recession lasting nearly three quarters less. However, this is less true during crises.

In columns (3) and (6) we interact fixed exchange rates with each type of macroeconomic crisis individually. None of the results for the duration of crises are statistically significant. However, the effects of exchange rates on crisis severity are both statistically and economically significant. The large effect of systemic financial crises in column (1) is driven by countries with fixed exchange rates, not flexible exchange rates. Similarly, currency crises affect countries with fixed but not flexible exchange rates, which is intuitive. Finally, commodity price shocks are associated with more severe recessions in countries with flexible exchange rates but less severe ones in countries with fixed exchange rates.

These results focus on two selected characteristics of recessions – their duration and the peak to trough rise in unemployment rates. As a complementary approach we estimate local projections to show the entire estimated time path of key variables. Following Jordà (2005), we estimate

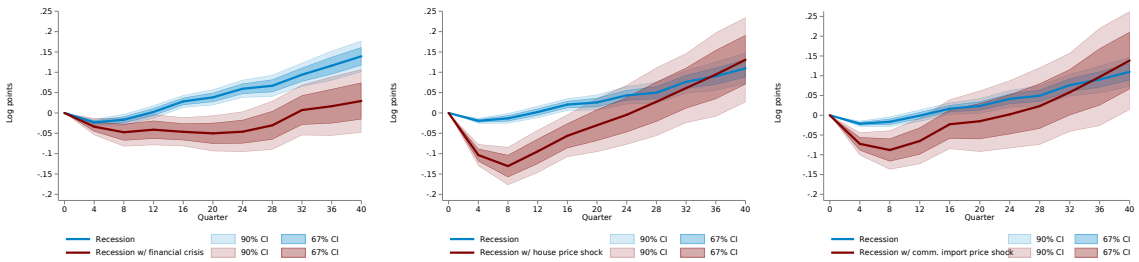
$$\Delta y_{t+h} = \beta_h + \beta_{h,c} D_{t,c} + \epsilon.$$

Here, Δy_{t+h} is the cumulative change in the outcome of interest y after $h \in \{4, 8, 12, 16, 20, 24, 28, 32, 36, 40\}$ quarters for a recession that started in time t. On the right-hand side, $D_{t,c}$ is a dummy that takes the value of 1 if the recession at time t was accompanied by shock c. We focus on estimating the influence of the three shocks that stand out in Table 1: financial crises, house price busts, and import commodity price increases. Then β_h captures the estimated time path of a typical recession (one without any accompanying crisis), while $\beta_{h,c}$ captures the estimated additional effect associated with a crisis of type c (so the total effect is $\beta_h + \beta_{h,c}$).

We start by showing the estimated time path of GDP per capita after each of these events in Figure 3 for context. The (common) blue line shows the estimated effect of a typical recession, meaning one that is not accompanied by any of the possible shocks. The

Figure 3: Local Projection Estimates of Effects of Crises on Output

(a) Financial Crisis (b) House Price Decline (c) Import Commodity Price Rise



red line in the figures shows the estimated path for output after a recession accompanied by a financial crisis, a house price decline, and an import commodity price rise. Consistent with the findings in the literature, each of these three shocks is associated with a worse recession. The shape is somewhat different: house price busts are associated with the sharpest decline but also the fastest recovery, whereas financial crises are particularly protracted events.

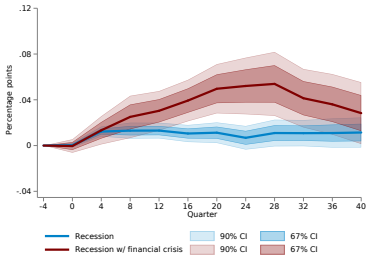
These results are known for the literature, but our labor market estimates are not. Figure 4 shows the time path for the aggregate labor market variables. The broad patterns are in line with the patterns for GDP. House price busts lead to the sharpest rise in unemployment – nearly a ten percentage point rise. However, the subsequent recovery is the swiftest. The rise in unemployment during a financial crisis is smaller, but much, much more protracted. The unemployment rate only begins to fall after 7 years; by this point in a house price bust, unemployment is nearly back to its pre-recession level. Finally, import commodity price shocks are an intermediate between the two. In each case the employment-population ratio shows similar patterns.

5 The Anatomy of Macroeconomic Crises

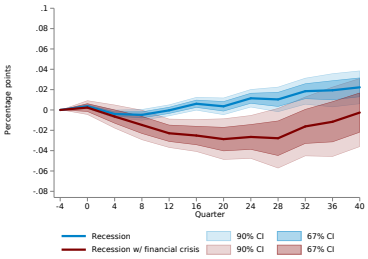
So far we have documented that the international data point to a much broader distribution of labor market experiences during recessions than previous work has studied. In particular labor markets can suffer from more severe and longer periods of low employment and high unemployment. These events are associated at least in part with known recessions of characteristics: financial crises, house price declines, and commodity price shocks. In this section we turn to the microdata spanning 38 countries and 124 recessions

Figure 4: Effects of Crises on Aggregate Labor Market Outcomes

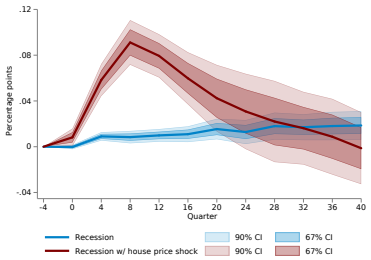
(a) Financial Crisis, U Rate



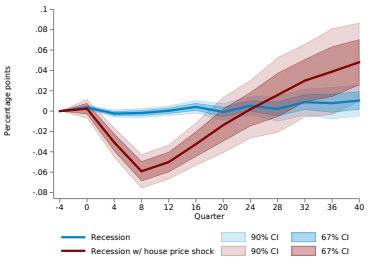
(b) Financial Crisis, Epop



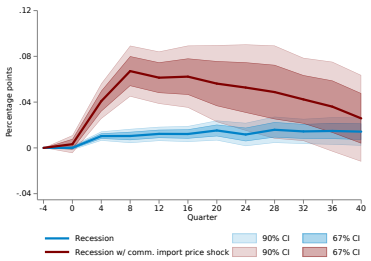
(c) House Price Bust, U Rate



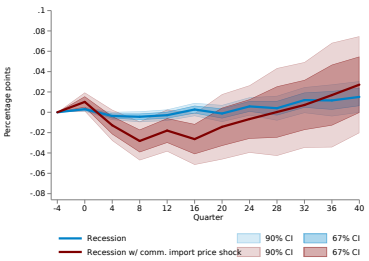
(d) House Price Bust, Epop



(e) Import Price Shock, U Rate



(f) Import Price Shock, Epop



and use it to study the anatomy of these crisis events. We focus on two key questions that cannot be answered by aggregate data alone. First, how do crises propagate through the economy? Second, who is affected by crises?

5.1 How Crises Propagate

We start by studying how crises propagate. Microdata are useful in two respects. First, they allow us to construct a wider range of fully harmonized outcomes than is typically reported by national statistical agencies. As a starting point, we construct the long-term unemployment rate, which we define consistently across countries as the share of the labor force that is 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 macroeconomic crises.

Additionally, since the underlying microdata are all from rotating panel labor force surveys, we can construct standardized, harmonized measures of labor market flows. Here, we concentrate on the quarterly job-finding rate, the separation rate, and the job-job transition rate. Specifically, these measure the share of the unemployed in a given quarter who are employed in the next; the share of the employed in a quarter who are unemployed in the next; and the share of workers in a given quarter with a different employer in the next.[7]

Figure 5: Labor Market Anatomy of a Financial Crisis

Figure 5 show the anatomy of a financial crisis. We provide results for the unemployment rate and the employment-population ratio to show that they are similar to those observed in aggregate data. The results for long-term unemployment show that it plays a small role in typical recessions (less than 1 percentage point rise), but that it becomes an important source of income risk during financial crises: it rises by 4 percentage points and does not begin to recover until seven years after the onset of the recession.

The panels in the bottom row show the effect of a financial crisis on labor market flows. Separation rates rise and job-finding rates fall. In each case, the change is both

[7]The first two are measured directly using changes in labor force status. The third is measured as changes in labor force status between wage work and self-employment, plus the share of workers with changes in reported tenure that are consistent with starting a new job.

much larger and much longer-lasting than is the case in a typical recession. To put these figures into context, recall that in the simplest model with only flows between employment and unemployment (no inactivity), the steady state unemployment rate is simply the separation rate divided by the sum of the separation rate and the job-finding rate. In the international context and measured at a quarterly frequency, the typical separation rate is about 3 percent and the typical job-finding rate is about 30 percent – albeit with substantial variation across countries (Donovan et al., 2022). These flows imply a steady-state unemployment rate of 9.1 percent. Increasing separation rates by 0.5 percentage points and cutting job-finding rates by 5 percentage points imply a new steady-state unemployment rate of 12.3 percent. Hence, these forces account for most of the rise in unemployment rates documented in Figure 5a.

Finally, Figure 5f shows that financial crises also effects on the job ladder by lowering the job-job transition rate. The point estimate implies a nearly one percentage point decline in the rate of job-job transitions, as compared to a typical average rate of about 10 percent in the cross-country context. However, data on job-job transitions are not available in all countries, so the standard error bands here are wider. We cannot reject that the effect is the same in financial crises as in typical recessions.

Figure 6: Labor Market Anatomy of a House Price Bust

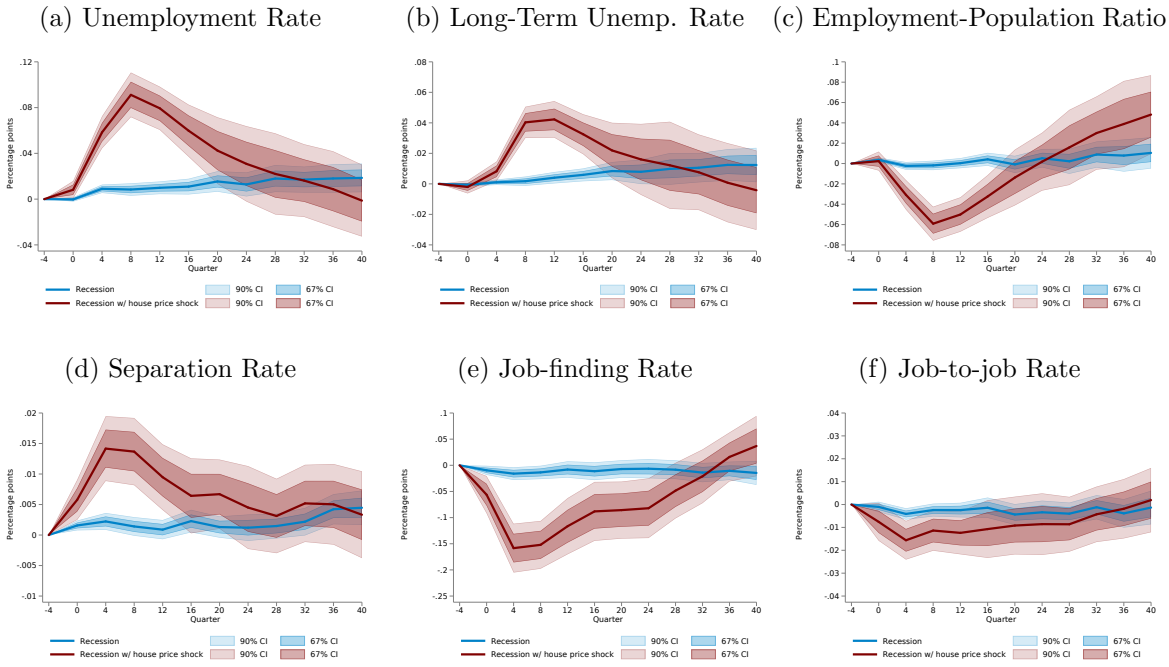
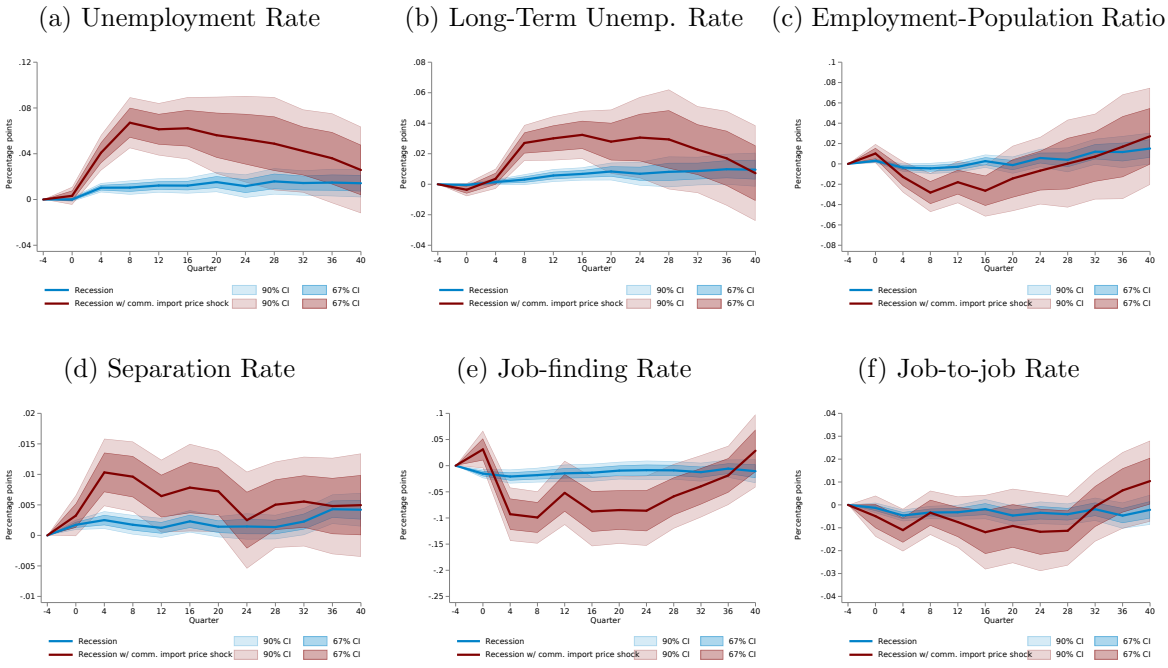


Figure 6 shows the same set of results for house price busts. The top row of re-

sults are similar to the last section, with the added feature of showing that long-term unemployment also has a large spike during house price busts. The bottom row shows why unemployment has such a sudden spike in a house price bust: separation rates rise sharply and job-finding rates plummet in the year after a house price bust. Using the same calculation as above, these changes imply a steady-state unemployment rate of roughly 23 percent. The implication is that unemployment would rise even more, except that separation rates and job-finding rates begin to recover relatively rapidly. Finally, Figure 6f show that there is one lasting effect of a house price bust: job-job transitions are less likely even five years afterwards.

Figure 7: Labor Market Anatomy of an Import Commodity Price Shock



Finally, Figure 7 shows the results of an import commodity price shock. As in previous cases, we see that this shock is in between the other two: smaller on impact but more durable than a house price bust, larger on impact but less durable than a financial crisis.

A second way in which microdata are useful is for investigating heterogeneity. We start by using this heterogeneity to understand the extent to which shocks spread via differential impacts across sectors. Specifically, we estimate separation rates for differential sectoral breakdowns. We break workers into mutually exclusive and exhaustive groups

$g \in G$. We then estimate

$$\Delta y_{g,t+h} = \beta_{g,h} + \beta_{g,h,c} D_{t,c} + \epsilon.$$

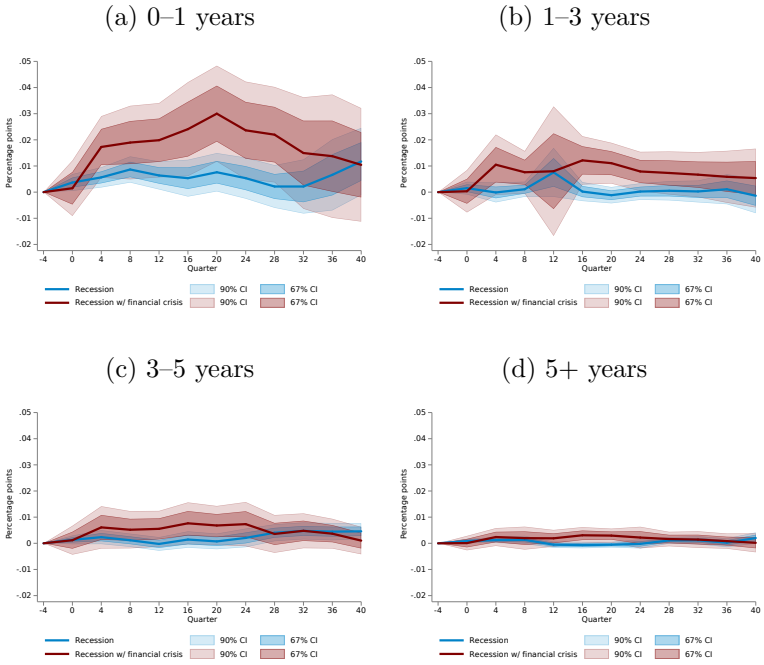
$y_{g,t+h}$ is now the change in outcomes (here, separation rates) for group g. We allow both the estimated effect in a typical recession $\beta_{g,h}$ as well as the estimated effect of shock c, $\beta_{g,h,c}$, to vary by group.

Figure 8: Separation Rates by Sector, Import Commodity Price Shock

Figure 8 shows the results of estimating this equation using three different sectoral splits for the case of an import commodity price shock. The first row shows that the effect is fairly balanced when comparing tradable and non-tradable sectors. The second shows that it is also fairly balanced when comparing services and goods. Finally, in the third row we focus on just two subsectors, agriculture and manufacturing. Here we find

some evidence that the initial spike in separations is roughly twice as large when focusing on just manufacturing and smaller when focusing on just agriculture. However, the main take-away is that the shocks seem to affect most of the economy. The figures for financial crises and house price busts (not shown to conserve space) are even more balanced along these sectoral splits.

Figure 9: Separation Rates by Tenure, Recessions and Financial Crises



One dimension that does turn out to be important for separation patterns and that offers a natural segue into our next result is job tenure. We can measure job tenure only for a subset of countries. In Figure 9 we plot time path of separation rates after recessions and financial crises for workers in four tenure bins: those with less than a year on the job, 1–3 years, 3–5 years and 5 or more years. This figure yields two main results. First, workers with less tenure experience a larger rise in separation rates after all recessions. Second, this effect is amplified in severe crises (here we show a financial crisis, but a similar result obtains for house price busts and commodity import price shocks). In this case the separation rate rises by as much as 3 percentage points and remains elevated for nearly the entire decade after the onset of the recession.

The fact that workers with less tenure are systematically more likely to separate suggests that the effect of severe recessions may vary more by worker than by firm characteristics. We turn to this data next.

5.2 Who Crises Affect

Finally, we use the microdata to ask who is affected by crises. Here 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.

Our approach here is similar to that at the end of the last section, in that we estimate separate group-specific responses to recessions as well as various shocks. Here, we focus on characteristics of workers (rather than firms), so we can study changes in group-specific unemployment rates.[8] We focus on two main characteristics. We distinguish three age groups: young (16–24 years old), middle age (25–54) and old (55 and over). We distinguish three education groups: less than high school completed, high school graduate, and some college or more. We have also explored gender, but the differences are smaller and less systematic than for age and education.

Figure 10: Changes in Unemployment by Demographic Groups

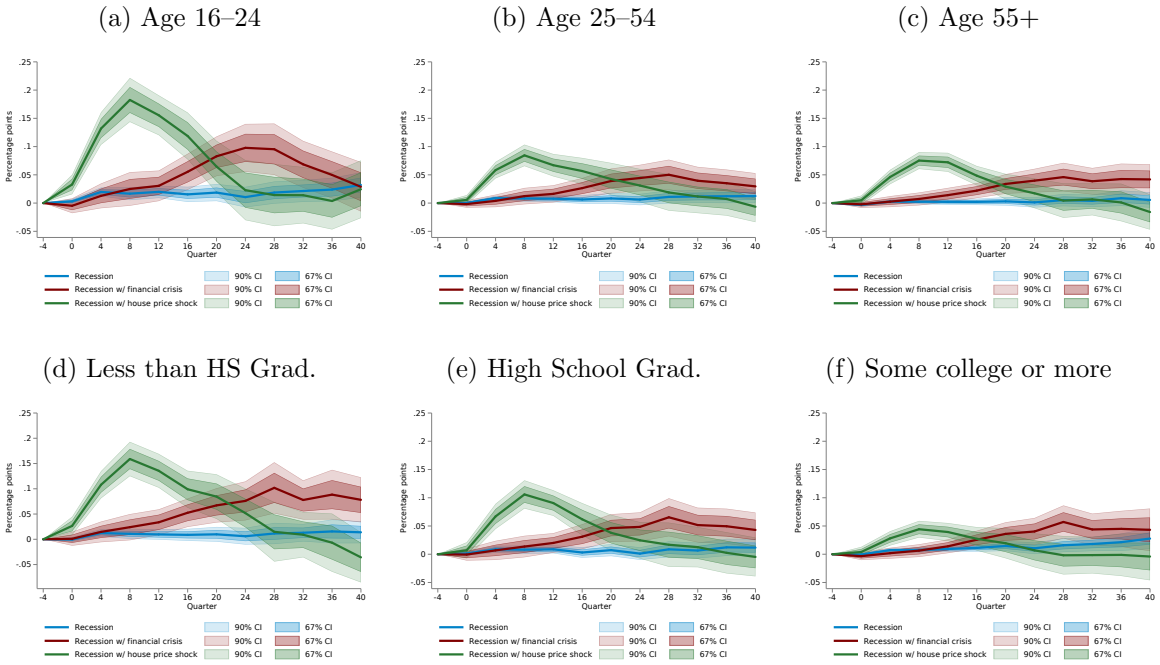


Figure 10 plots the estimated change in the unemployment rate by age group (first

[8]This approach does not work for firm characteristics such as sector of employment because most labor force surveys do not ask the unemployed about the characteristics of their previous employer.

row) and education level (second row). We estimate the effect for typical recessions (in blue), for financial crises (in red), and for house price busts (in green); import commodity price shocks are between the latter two cases. These figures reveal two main results. First, marginal workers are always more affected by unemployment during recessions. Here, the relevant notions of marginal are young, old, and less educated. For example, the effect of a recession on unemployment for workers with less than a high school degree is roughly twice that for workers with some college or more. Second, these effects are systematically amplified during macroeconomic crises. For example, less educated workers are roughly twice as affected by financial crises and three times as affected by house price busts as the most educated workers.

Figure 11: Changes in Long-Term Unemployment by Demographic Groups

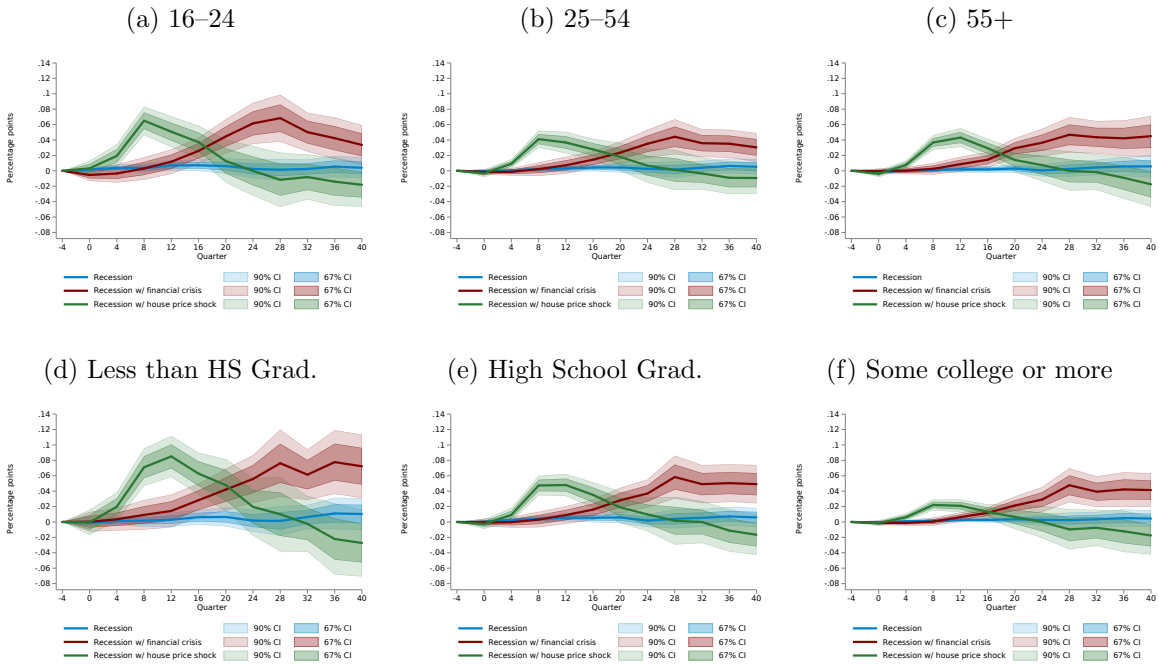
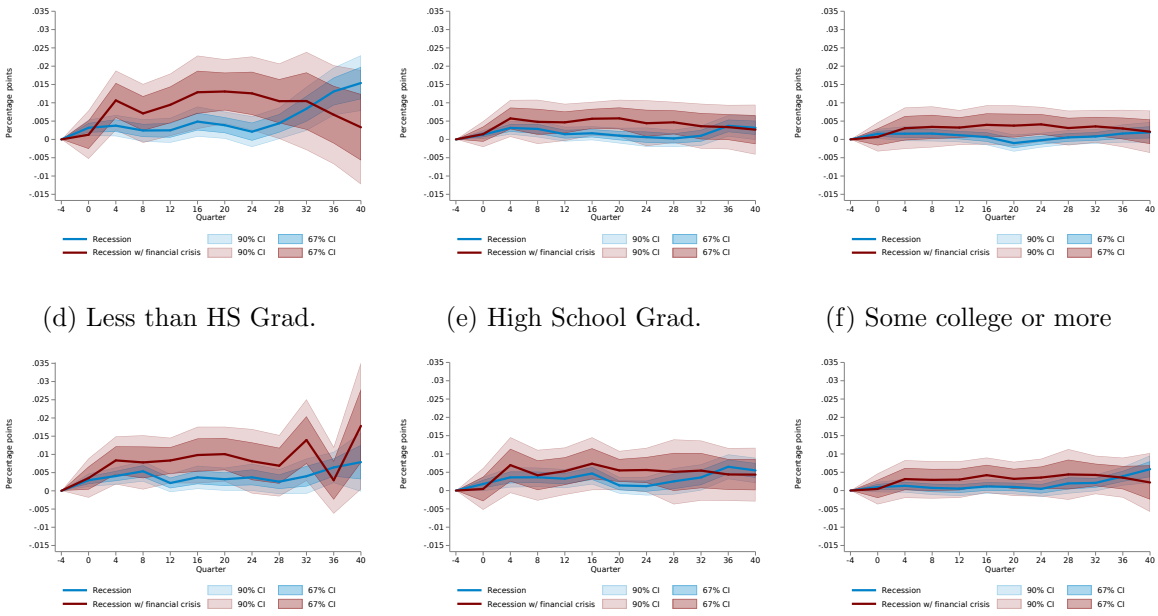


Figure 11 shows similar results for long-term unemployment, our main measure of extreme labor market-related risk. Broadly similar findings apply. Marginal workers are always more exposed to long-term unemployment risk. However, during typical recessions this risk is small for every worker. For major crises that risk becomes relevant. Young and less-educated workers experience two to third times as large a rise in long-term unemployment rates during these events.

The final two figures help us understand the sources of these rises in unemployment rates. Figure 12 plots the estimated time path of separation rates, while Figure 13 plots

Figure 12: Changes in Separation Rates by Demographic Groups

(a) 16–24 (b) 25–54 (c) 55+



(d) Less than HS Grad. (e) High School Grad. (f) Some college or more

the estimated time path of job-finding rates. The. main message is that separation rates rise more for marginal workers by both measures that we use here. However, job-finding rates fall disproportionately only for young workers. Across education groups, the effect is fairly balanced.

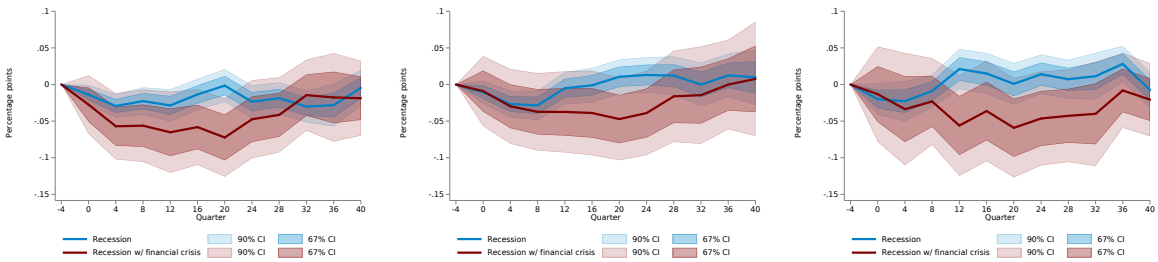
To summarize, the microdata show that macroeconomic crises involve not just a rise in unemployment rates but also in long-term unemployment rates. They are broad-based in the sense that they generate a rise in separation rates across all sectors and a decline in job-finding rates. As we study the types of workers who are most affected, we find consistently that marginal workers – low-tenure, young or old, and less educated workers – are most affected. This is true even in typical recessions, but it is particularly true in macroeconomic crises.

6 Conclusion

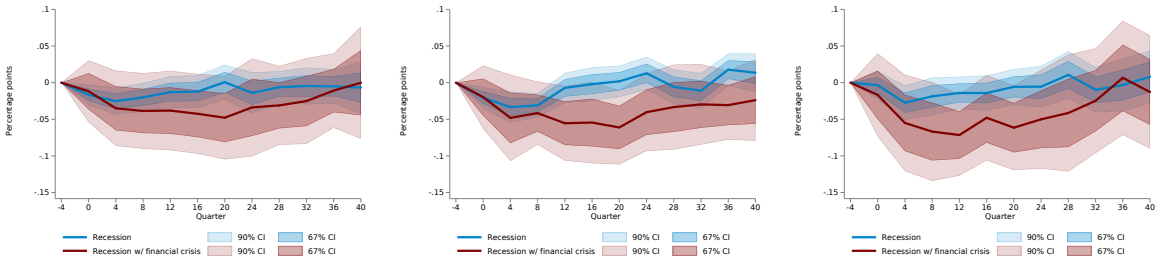
Labor markets play a central role in evaluating the welfare costs of business cycles because they are the central mechanism for transforming aggregate shocks into idiosyncratic income shocks. In this paper we developed a new aggregate data set and microdata set covering labor market outcomes for dozens of countries and hundreds of recessions. At

Figure 13: Changes in Job-Finding Rate by Demographic Groups

(a) 16–24 (b) 25–54 (c) 55+



(d) Less than HS Grad. (e) High School Grad. (f) Some college or more



the aggregate, the data set offers a sufficient sample to allow us to differentiate the labor market consequences of uncommon shocks such as house price busts or financial crises. At the micro, the data set contains short rotating panel data on individual workers that allows us to understand labor market flows and what specific workers are affected.

We use this data to make three main contributions to the literature. First, we characterize the distribution of labor market outcomes in response to this large sample of recession events. We find substantial heterogeneity. The most important piece for welfare is that we find recessions can have a larger and longer-lasting negative effect on labor markets than previous work. Second, we investigate the determinants of these severe downturns. We find that in large part they can be traced back to macroeconomic crisis events, such as financial crises, house price busts, and commodity price movements. These events are correlated with a 3–5 percentage point larger rise in the unemployment rate and up to 4 additional quarters before the onset of a recovery in the labor market, as compared to a typical recession. Third, we find that while macroeconomic crises affect the economy broadly across sectors, they are borne disproportionately by marginal workers. Jointly, these findings suggest that welfare costs of business cycles broadly and macroeconomic crises specifically are much larger than what has been estimated previously.

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Online Only Appendix

Table of Contents for Appendix

A Data Details

Table A1: Shocks in macro and micro datasets

	Macro	Micro
Recessions	292	125
Systemic financial crises	17	10
Non-systemic financial crises	10	6
Stock market crashes	83	44
Currency crises	46	23
Debt defaults	2	2
House price shocks	12	7
Commodity import price shocks	76	14
Commodity export price shocks	32	17

A.1 Coverage by Country

Table A2: Coverage of Macro Dataset

Country	Sources	Quarters		Observations	Recessions
Albania	Eurostat	2012q1	2022q2	42	2
Argentina	OECD	2004q1	2020q4	68	6
Australia	OECD	1966q3	2022q3	225	10
Austria	Eurostat, OECD	1995q1	2022q3	120	5
Belgium	Eurostat, OECD	1995q1	2022q3	160	4
Bolivia	INE Bolivia	2015q4	2022q2	27	5
Brazil	OECD	2012q1	2022q3	43	2
Bulgaria	Eurostat, OECD	2000q1	2022q3	92	2
Canada	OECD	1961q1	2022q3	271	14
Chile	OECD	1986q1	2022q3	147	7
Colombia	OECD	2007q1	2022q3	63	2
Costa Rica	OECD	2010q3	2022q3	49	2
Croatia	Eurostat	2000q1	2022q3	92	3
Cyprus	Eurostat	2000q1	2022q3	92	4
Czech Rep.	Eurostat	1996q1	2022q3	120	4
Denmark	Eurostat	1995q1	2022q3	160	6
Ecuador	LFS data	2007q2	2020q4	56	5
Egypt	LFS data	2008q1	2012q3	19	2
Estonia	Eurostat	1997q1	2022q3	104	6
Finland	Eurostat	1990q1	2022q3	140	8
France	Eurostat	1983q1	2022q3	160	8
Georgia	LFS data	2009q1	2020q3	47	4
Germany	Eurostat	1991q1	2022q3	128	9
Greece	Eurostat, OECD	1998q2	2022q3	98	5
Hungary	Eurostat	1996q1	2022q3	108	6
Iceland	Eurostat	2003q1	2022q3	80	5
Ireland	Eurostat	1995q1	2022q3	160	4
Israel	OECD	1995q1	2022q3	111	5
Italy	Eurostat	1995q1	2022q3	160	5
Japan	Eurostat, OECD	1994q1	2022q3	272	6
Korea	OECD	1990q1	2022q3	131	4
Latvia	Eurostat	1998q2	2022q3	99	2
Lithuania	Eurostat	1998q1	2022q3	100	2
Luxembourg	Eurostat	1995q1	2022q3	160	9
Malta	Eurostat	2000q1	2022q3	92	5
Mexico	OECD	1993q1	2022q3	143	9
Netherlands	Eurostat	1996q1	2022q3	160	4
New Zealand	OECD	1987q2	2022q3	147	6
No. Macedonia	Eurostat	2006q1	2021q1	61	3
Norway	Eurostat	1989q1	2022q3	136	7
Paraguay	LFS data	2010q1	2017q2	30	6
Peru	LFS data	2007q1	2018q3	63	5
Philippines	LFS data	1988q2	2003q1	60	10
Poland	Eurostat	1997q1	2022q3	104	4
Portugal	Eurostat	1995q1	2022q3	160	5
Romania	Eurostat	1997q1	2022q3	104	3
Serbia	Eurostat	2008q2	2022q2	57	4
Slovak Rep.	Eurostat	1998q1	2022q3	100	3
Slovenia	Eurostat	1996q1	2022q3	108	3
So. Africa	OECD	2008q1	2021q1	53	5
Spain	Eurostat	1995q1	2022q3	147	2
Sweden	Eurostat	1993q1	2022q3	160	4
Switzerland	Eurostat	1999q2	2022q3	94	5
Turkey	Eurostat	2005q1	2022q3	71	3
UK	Eurostat, OECD	1983q1	2022q3	159	4
USA	Eurostat, OECD	1960q1	2022q3	272	9
W.Bank-Gaza	LFS data	2000q1	2020q3	83	10
Total: 57 countries		6,468 observations			292 recessions

Table notes: Quarters are the time period for each country. Observations is the number of quarters covered. Recessions is the number of recessions the country has experienced during the years covered.

Table A3: Coverage of Micro Dataset

	Quarters		Observations (1000s)	Recessions
Argentina	2004q1	2020q4	872	6
Austria	2010q1	2020q3	743	3
Brazil	2002q2	2021q1	7,408	4
Chile	1986q1	2021q1	6,914	5
Costa Rica	2010q3	2021q1	248	3
Croatia	2010q1	2020q3	89	2
Cyprus	2005q1	2020q3	261	3
Czech Republic	2005q1	2010q3	591	1
Denmark	2007q1	2020q3	306	4
Ecuador	2007q2	2020q3	314	4
Egypt, Arab Rep.	2008q1	2012q3	84	2
Estonia	2005q1	2020q3	90	4
France	2003q1	2017q3	2,378	2
Georgia	2009q1	2020q3	73	3
Greece	2005q1	2018q3	1,195	2
Hungary	2005q1	2020q3	1,640	4
Iceland	2005q1	2020q3	67	3
Ireland	2007q1	2016q3	705	1
Italy	2005q1	2020q3	2,019	3
Latvia	2007q1	2016q3	78	1
Lithuania	2005q1	2020q3	227	1
Malta	2009q1	2020q3	59	4
Mexico	1995q1	2021q1	18,012	7
Paraguay	2010q1	2017q2	45	6
Peru	2007q1	2018q3	248	5
Philippines	1988q2	2003q1	1,158	10
Poland	2010q1	2020q3	878	0
Portugal	2010q1	2020q3	544	2
Romania	2005q1	2020q3	929	2
Slovak Republic	2005q1	2020q3	639	1
Slovenia	2014q1	2020q3	116	1
South Africa	2008q1	2021q1	872	3
Spain	2000q1	2020q1	7,197	2
Sweden	2006q1	2020q3	1,631	5
Switzerland	2010q1	2019q3	289	1
United Kingdom	1997q1	2020q3	3,878	2
United States	1976q1	2021q3	7,632	6
West Bank & Gaza	2000q1	2020q3	377	10
Total: 38 countries	2,303 quarters		70,659 observations	128 recessions

Table notes: quarters is number of quarters covered. Observations is the number of people matched for two quarters, expressed in thousands. Recessions is the number of recessions the country has experienced during the years covered.

B Additional Results

Table B1: Unemployment response to recessions: severity and duration

	Severity			Duration		
	(1)	(2)	(3)	(4)	(5)	(6)
Systemic financial crisis	1.852**	2.852***	2.117***	2.051	2.368	0.978
	(0.735)	(0.796)	(0.734)	(1.365)	(1.575)	(1.419)
Non-systemic financial crisis	1.721*	1.142	1.614	2.974	0.729	-0.367
	(0.983)	(1.100)	(1.006)	(1.824)	(2.191)	(1.964)
House price depreciation shock	3.406***	2.594***	2.086**	-1.247	-0.361	-0.630
	(0.900)	(0.956)	(0.875)	(1.669)	(1.905)	(1.703)
Great Recession	0.765	0.809	0.499	3.356***	3.236***	2.223**
	(0.550)	(0.548)	(0.502)	(0.993)	(1.057)	(0.954)
GDP recession measure			19.450***			0.802***
			(2.921)			(0.105)
Constant	1.481***	-0.950	-2.288	5.427***	4.000	1.994
	(0.193)	(1.901)	(1.745)	(0.351)	(3.802)	(3.408)
R^2	0.121	0.396	0.500	0.075	0.258	0.410
N	275	275	275	287	287	287
Countries	57	57	57	57	57	57
Country FE	No	Yes	Yes	No	Yes	Yes

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