Labor Markets, Financial Crises, and Inflation: Jobless and Wageless Recoveries*

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December 15, 2024

Abstract

We document the macroeconomic patterns that characterize labor market recovery from financial crises. Using a sample of postwar recession episodes from around the world, we show that financial crises are typically followed by jobless recoveries, with a sluggish recovery of employment relative to output. A departure from this empirical regularity occurs in emerging-market crises with high inflation, which feature strong employment recoveries but persistent declines in real wages and result in "wageless recoveries." Our findings highlight the central role of financial components in labor input costs and nominal wage rigidities in shaping labor market dynamics following economic crises.

Keywords: Jobless recoveries, financial crises, inflation, wage rigidities

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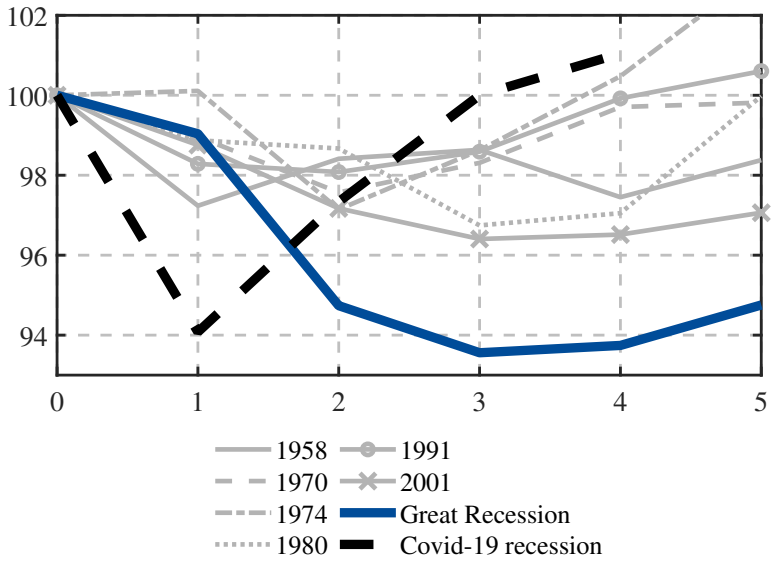
1. Introduction

The decline in employment that accompanies economic contractions is a defining characteristic of economic crises. In recent decades, concern over labor market dynamics following recession episodes has been heightened by the occurrence of "jobless recoveries," which involve a slow recovery of the labor market (see, for example, Gordon and Baily, 1993; Bernanke, 2009; Jaimovich and Siu, 2020). In this context, Figure 1 illustrates that the two most recent U.S. recessions exhibit substantially different patterns. The Great Recession stands out as the crisis with the most prolonged effects on employment, with percapita employment remaining more than 5 % below its pre-crisis levels 5 years after the crisis began. In contrast, the recent pandemic recession is notable for its faster employment recovery, despite the sizable initial contraction.

Figure 1: Employment Recovery for U.S. recessions



Notes: This figure shows the dynamics of employment in the United States for postwar recession episodes (NBER dates). Employment is expressed in per capita terms and normalized to 100 in the year before the recession begins. Data source: Federal Reserve Bank of St. Louis.

Motivated by these patterns, we conduct an empirical investigation that characterizes labor market recovery following recession episodes observed across the globe over the last eight decades. We focus on two central dimensions of these episodes. First, guided by the

role of credit market disruptions during the Great Recession (see, for example, Chodorow-Reich, 2014; Christiano, Eichenbaum and Trabandt, 2015; Gertler and Gilchrist, 2018), we examine the role of financial market conditions in shaping labor market recovery. Using a sample of 23 developed-market economies since the 1950s, we document that recessions associated with financial crises (i.e., banking or debt crises) are followed by jobless recoveries: per capita output returns to its pre-crisis level, but per capita employment does not. We also observe persistent declines in other labor market indicators, such as hours worked, participation rates, and the labor wedge. Meanwhile, the capital stock exhibits relative resilience and remains above its pre-crisis level at the output recovery point. These jobless recoveries following financial crises are significantly larger than those observed after other recession episodes of similar magnitude and are not driven by specific time periods or country-specific characteristics associated with financial crises. However, real wages increase throughout financial crises and do not exhibit a particularly different pattern from those observed during other recession episodes. This suggests that the adjustment in developed-market economies primarily occurs through changes in labor input rather than significant shifts in real wages.

Second, motivated by the inflation surge following the pandemic recession, we study the role of inflation in shaping labor market recovery. To this end, we extend our empirical analysis to a sample of 35 emerging-market economies, which exhibit significantly larger heterogeneity in inflation rates during recession episodes relative to the developed-market sample. We first document that emerging-market financial crises that feature moderate levels of inflation (i.e., below 30 %, as considered by Dornbusch and Fischer, 1993) exhibit patterns broadly aligned with those observed in developed economies, with jobless recoveries but no declines in real wages. We then show that emerging-market financial crises with higher levels of inflation exhibit a remarkably different pattern: strong recovery of employment but "wageless recoveries"—that is, persistent declines in real wages that do not recover alongside economic activity.

The empirical patterns we document suggest the presence of two key economic forces operating during jobless recoveries. First, a significant financial component in labor input costs. This can arise, for example, if labor contracts require payment in advance (see, for example,

Christiano and Eichenbaum, 1992; Neumeyer and Perri, 2005; Jermann and Quadrini, 2012; Bigio, 2015) or substantial upfront costs that must be financed (see, for example, Petrosky-Nadeau, 2014). Under these conditions, the sluggish labor market recovery observed during financial crises can result from credit market disruptions, which persistently increase the financial component of labor input costs. Second, our findings are consistent with the presence of downward nominal wage rigidities, which, in a low-inflation context, prevent higher labor input costs from translating into lower real wages and instead result in lower employment (see, for example, Akerlof et al., 1996; Schmitt-Grohé and Uribe, 2016; Chodorow-Reich and Wieland, 2020; Dupraz, Nakamura and Steinsson, 2019, and references therein). These forces could also explain why financial crises in high-inflation environments feature a recovery of employment at the expense of lower real wages. From a policy perspective, these findings suggest that credit-market stability and inflation dynamics can play a central role in shaping labor market recoveries from economic crises.

Related literature. Our paper contributes to several strands of the literature. First, it contributes to the literature on jobless recoveries. A rich body of work has studied the role of long-run trends in driving this type of recovery, including structural change (e.g., Groshen and Potter, 2003; Jaimovich and Siu, 2020; Restrepo, 2015); gender convergence (e.g., Albanesi, 2019; Fukui, Nakamura and Steinsson, 2023; Olsson et al., 2019); labor mobility; workforce aging; and cultural norms (Coibion, Gorodnichenko and Koustas, 2013). We contribute to this literature by showing that jobless recoveries are more pronounced in the presence of credit market disruptions and low levels of inflation. This finding aligns with the role of wage rigidities in jobless recoveries, as studied by Shimer (2012) in the context of frictional labor markets and Schmitt-Grohé and Uribe (2017) in the presence of nominal wage rigidities.

Our paper also contributes to the extensive body of work that studies the effects of financial crises. At the macro level, this literature has documented that financial crises are associated with particularly large and persistent contractions in economic activity and employment (see, for example, Reinhart and Rogoff, 2009, 2014; Jordà, Schularick and Taylor,

2011; Schularick and Taylor, 2012; Donovan et al., 2024). Using cross-sectional, regional, and time-series data, the literature has identified a credit-supply channel that affects employment and investment, which can help rationalize the aggregate dynamics observed during these episodes (see, for example, Chodorow-Reich, 2014; Huber, 2018; Gilchrist and Zakrajšek, 2012; Ottonello and Song, 2022). Our contribution to this literature is twofold. First, we show that credit market disruptions disproportionately affect labor inputs. Second, we provide evidence that the level of inflation may play a critical role in shaping the specific form of aggregate adjustment following credit market disruptions, and predominantly affects either employment or real wages.

Finally, our paper relates to the literature on the costs of inflation (see, for example, Burstein and Hellwig, 2008, and references therein). Our findings on wageless recoveries align with survey evidence from Stantcheva (2024), which shows that households primarily dislike inflation because it erodes their purchasing power. In this sense, our results provide evidence consistent with theoretical models that link the welfare costs of inflation to real wage adjustments (for recent studies in this area, see Afrouzi et al., 2024; Guerreiro et al., 2024; Hajdini et al., 2023; Pilossoph and Ryngaert, 2024).[1]

The rest of the paper is organized as follows. Section 2 presents empirical evidence that characterizes the recovery from financial crises in developed-market economies. Section 3 introduces data on emerging-market economies to study the role of inflation in shaping the type of labor market recovery following financial crises. Section 4 concludes.

2. Recovery from Financial Crises

We document that financial crises in developed-market economies tend to be followed by jobless recoveries. Section 2.1 defines our measures of recession episodes, jobless recoveries, and financial crises, and describes the data used in the empirical analysis. Section 2.2 presents

[1] Our evidence also suggests that, during financial crises, the alternative to wageless recoveries might be jobless recoveries. This introduces a potentially interesting source of state dependency for the costs of inflation (i.e., depending on underlying financial conditions) that could be further explored using both survey evidence and theoretical models.

the results.

2.1. Methodology and data

An accounting framework for recession recoveries. We analyze recovery from financial crises and other recession episodes using an accounting framework in the spirit of Solow (1957). We consider a discrete-time economy in which aggregate output and inputs are connected through the production function:

$$y_t = A_t k_t^{\alpha} (\gamma^t l_t)^{1-\alpha},$$

where y_t represents per capita output, k_t and l_t represent per capita capital and labor inputs, A_t denotes a stationary total factor productivity (TFP) process, $\gamma \geq 1$ represents the growth rate of labor-augmenting technology, and $\alpha \in (0, 1)$.

To define a recession, let us assume that output in the economy contracts in period $t = t_c$ and recovers to $\gamma^{t_R - t_c - 1} y_{t_c - 1}$ in period t_R. The evolution of output between the recession peak ($t_P \equiv t_c - 1$) and the recovery point (t_R) can be decomposed into the contributions of three factors:

$$\Delta_d \log y_{t_R} = \underbrace{\gamma d + \frac{1}{1-\alpha} \Delta_d \log A_{t_R}}_{\text{productivity contribution}} + \underbrace{\frac{\alpha}{1-\alpha} \Delta_d \log \left(\frac{k_{t_R}}{y_{t_R}} \right)}_{\text{capital contribution}} + \underbrace{\Delta_d \log l_{t_R}}_{\text{labor contribution}},$$

where $d = t_R - t_P$ measures the duration of the recession episode. Along a balanced-growth path, A_t, $\frac{k_t}{y_t}$, and l_t would remain constant.[2] Relative to this benchmark, we empirically characterize recovery from a recession by investigating the contribution of different factors to production compared with their balanced-growth path evolution. Specifically, we define a "jobless recovery" as the recovery from a recession in which the labor factor exhibits a negative contribution between the output peak and the recovery, i.e., $l_{t_R} < l_{t_P}$. Our empirical analysis focuses on examining the dynamics of these factors during various types of recession

[2] As is standard, to define such a balanced-growth path we would have to specify preferences, the technology for capital accumulation, and equilibrium. Because we abstract here from a particular specification of these elements, our statement refers to any economy that features a balanced-growth path.

episodes—both financial crises and other recessions—which we will define in subsequent sections.

Data. In this section, we provide a summary of the data used in our empirical analysis. For more detailed description of data sources, please refer to Appendix A. Our empirical analysis focuses on a sample of 23 high-income OECD economies: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. We refer to this sample as the developed-market sample. In Section 3, we expand the analysis to include a sample of emerging-market economies.

We focus on data sources that have broad availability across countries and time. For real GDP, capital stock, employment, and hours worked, we use data from the Penn World Tables, which are available for our developed-market sample since the 1950s (and also for the emerging-market sample we analyze later in the paper). With this dataset, we also estimate α, computed as the average capital share of GDP, and measured productivity as the Solow residual. To express output, capital, and labor inputs in per capita terms, we use data for the working-age population. We construct this measure by combining the total population from the Penn World Tables with the working-age-to-population ratio, defined as the population aged 15–64 divided by the total population. The working-age-to-population ratio is obtained from the OECD and World Development Indicators (WDI) datasets.

Our empirical analysis also uses additional data to further characterize the dynamics during crisis recoveries across three labor market dimensions. First, we examine unemployment, which we measure using data from sources such as the WDI, World Economic Outlook (WEO), and national sources. Second, we analyze real wages, which we construct using nominal wage data from the Conference Board's International Labor Comparisons program (ILC), WEO, and national sources. These wages are then deflated using the Consumer Price Index (CPI). Third, we examine the labor wedge, defined as the ratio of the marginal rate of substitution between consumption and leisure to the marginal product of labor. The labor

wedge is a variable frequently used in macro and labor literature to measure distortions in the labor market relative to the neoclassical framework (see, for example, Shimer, 2009).[3]

Definition of recession episodes and financial crises. In our empirical analysis, we define a recession episode as a time window that encompasses a contraction of annual per capita GDP followed by a recovery to pre-contraction levels. To determine the peak, trough, and recovery point of recession episodes, we identify recession episodes using the following algorithm:

1. For each country i, identify the first recession episode as the first period in which there is a per capita output contraction -i.e., $t_c(i,1) \in [1, T_i]$ - such that $y_{t_c(i,j)} < y_{t_c(i,j)-1}$ for $j = 1$, where T_i denotes the last year with available data for country i.

2. Define the *peak* of recession episode j as the period immediately preceding the output contraction that marks the beginning of the recession episode: $t_P(i,j) \equiv t_c(i,j) - 1$.

3. Define the *recovery point* of recession episode j as the period $t_R(i,j) > t_c(i,j)$ in which per capita output recovers its peak level or its trend (HP-filtered with a smoothing parameter of 100). If there is no recovery point within the available data, the recession is excluded from the analysis.

4. Define the *trough* of the recession episode as the period with the minimum level of per capita output between the peak and recovery points.

5. Repeat steps (1)-(3), identifying periods of output contraction after the previous recovery point. Specifically, for $j = 2, 3, \ldots$, identify $t_c(i,j) \in [t_R(i,j-1)+1, T_i]$, such that $y_{t_c(i,j)} < y_{t_c(i,j)-1}$, until there are no more output contractions in that country after the last recovery point.

[3]Measuring the labor wedge requires specifying households' preferences over consumption and leisure. In our baseline computations, we assume a separable utility function for households, $\log(c_t) - \frac{\chi}{1+\eta} h^{\frac{1+\eta}{\eta}}$, where η represents the Frisch elasticity of labor supply. With these preferences, we compute the evolution of the labor wedge from the recession's peak to recovery as $\Delta_d \log(1-\tau_{t_R}) = \Delta_d \log c_{t_R} - \Delta_d \log y_{t_R} + \frac{1+\eta}{\eta} \Delta_d \log h_{t_R}$ where τ_{t_R} is the labor wedge. For this computation, in addition to the output and employment variables described earlier, we use real consumption data from the Penn World Tables. In our baseline computations, we set $\eta = 1$.

Using our definition of recessions, we identify 143 recession episodes in developed countries, detailed in Appendix Tables 3 and 4. Table 1 provides summary statistics of our sample of recession episodes, which show an average per capita output contraction of 3%, an average duration of 1.6 years between peak and trough, and an average duration of 1.8 years between the trough and recovery. This results in an average duration of 3.4 years between the peak and recovery. In analyzing individual episodes, we note that our method often coincides with those frequently used by researchers in the field, such as NBER recession episodes for the U.S. and the ECRI for Europe. One notable difference is that our method bundles "double-dip" recessions, in which a second output contraction occurs before output reaches its recovery point, such as the 1980-81 recession in the U.S.

Within our sample of recession episodes, we define a *financial crisis* as an episode that coincides with a banking crisis or a debt crisis event that occurs within a window from 1 year before the output peak to 1 year after the output recovery point. Data on banking and debt crises are obtained from Reinhart and Rogoff (2009). Based on this definition, we classify 46 recession episodes as financial crises.

As shown in Table 1, the average output contraction in financial crises is larger than that in non-financial recessions. To create a group of non-financial recession episodes that is more comparable to financial crises in terms of economic contraction, we construct a category called "other large recessions" by excluding from non-financial recessions those episodes with output contractions below a certain cutoff value, denoted by $\underline{y}$. We set $\underline{y}$ to a value such that the average contraction in other large recessions matches that of financial crises. In our sample, we use $\underline{y} = -0.014$. Table 1 presents descriptive statistics for both the group of other large recessions and the group of "mild recessions," which consists of episodes in the other group with output contractions below $\underline{y}$. It is important to note that our conclusions regarding differences between recoveries from financial crises and other episodes are stronger when mild recessions are included in the comparison group of non-financial crises. The objective in constructing the comparison group with other large recessions is to ensure that the results are not driven solely by the magnitude of the output contraction.

Table 1: Summary Statistics of Recession Episodes in Developed-Market Economies

	All episodes	Financial crises	Other episodes	
			Large	Mild
(a) Output per capita contraction (%)				
Mean	3.0	4.1	4.1	0.6
Median	1.8	4.3	3.5	0.6
Std. dev.	3.3	4.3	2.6	0.4
Min	0.0	0.1	1.4	0.0
Max	25.3	25.3	11.4	1.3
(b) Duration from peak to recovery (years)				
Mean	3.4	4.3	3.6	2.2
Median	3.0	4.0	3.0	2.0
Std. dev.	1.9	2.2	1.9	0.6
Min	2.0	2.0	2.0	2.0
Max	10.0	9.0	10.0	5.0
(c) Duration from trough to recovery (years)				
Mean	1.8	2.3	1.9	1.1
Median	1.0	2.0	2.0	1.0
Std. dev.	1.2	1.4	1.1	0.3
Min	1.0	1.0	1.0	1.0
Max	6.0	6.0	5.0	2.0
Number of episodes	143	46	52	45

Notes: This table presents descriptive statistics of the recession episodes used in the empirical analysis for our sample of developed-market economies. Panel (a) reports descriptive statistics of the output contraction observed in each episode, measured in percent, from peak to trough. Panels (b) and (c) show the duration from peak to trough and from trough to recovery, respectively, measured in years. The column labeled *All* presents descriptive statistics for the entire set of recession episodes identified using the algorithm described in Section 2.1, and the column labeled *financial crises* represents statistics for the recession episodes classified as financial crises according to the definition provided in Section 2.1. The columns labeled *Other episodes* report statistics for recession episodes that are not classified as financial crises. The *Large* category includes episodes with an output peak-to-trough contraction above -0.014, chosen to match the average contraction of financial crises. The *Mild* category encompasses the remaining episodes that do not meet the criteria for classification as large recessions. See Appendix A for further information on the definition of variables and data sources.

2.2. Empirical Results

Financial crises. The first column of Table 2 presents the results of our accounting exercise for the recovery from financial crises. Specifically, it reports average changes in the log of output, employment, the capital-output ratio, and measured productivity from the episode peak to the recovery point. Complementing this, the top panels of Figure 2 illustrate the dynamics of these variables throughout the episodes, showing their changes from peak to trough and from trough to recovery.

Table 2: Recovery from Financial Crises

	Developed	Emerging Markets	
	Markets	Moderate inflation	High Inflation
(a) Accounting exercise			
Output	0.004	-0.005	-0.021*
	[0.006]	[0.010]	[0.011]
Employment per capita	-0.034***	-0.010*	0.006
	[0.007]	[0.005]	[0.008]
Capital-output ratio	0.043***	0.021**	0.023
	[0.008]	[0.010]	[0.016]
Productivity	0.006	-0.005	-0.024*
	[0.007]	[0.008]	[0.013]
(b) Labor market dynamics			
Hours worked	-0.051***	-0.016*	-0.005
	[0.009]	[0.008]	[0.010]
Unemployment rate	0.026***	0.013***	0.006
	[0.005]	[0.003]	[0.004]
Labor force participation	-0.007	0.015**	0.022***
	[0.004]	[0.006]	[0.008]
Real wages	0.024**	0.004	-0.116**
	[0.011]	[0.024]	[0.052]
Labor wedge	0.067***	0.009	-0.011
	[0.017]	[0.013]	[0.021]

Notes: This table presents the results of estimating $\Delta_{t_R(i,j)-t_P(i,j)} Z_{i,t} = \alpha + \epsilon_{i,j}$ in a sample of financial crises, where $Z_{i,t}$ represents one of the following variables: the log of GDP over working-age population, the log of employment over working-age population, the log of the capital-output ratio, the log of measured productivity, the log of hours worked over working-age population, the unemployment rate, the log of labor force participation over working-age population, the log of real wages, or the log of the labor wedge for episode j in country i. The terms $\{t_P(i,j), t_R(i,j)\}$ denote the output peak and recovery point of each episode j in country i. The table reports the estimated parameter α. For the definition of financial crises, see Section 2.1. The *Moderate inflation* and *High inflation* categories include episodes with maximum annual CPI inflation during a crisis below and above 30 %, respectively. $*$, $**$, and $***$ represent statistical significance at the 10%, 5%, and 1% levels, respectively.

The first two rows of Table 2 and Panels (a) and (b) of Figure 2 show that financial crises tend to be followed by jobless recoveries: when output returns to its pre-crisis level, employment remains, on average, 3% below its pre-crisis level. The third row of Table 2 and Panel (c) of Figure 2 indicate that the counterpart of jobless recoveries is the resilience of the capital stock, which increases from peak to trough and remains 4% above its pre-crisis level at the recovery point. Finally, the fourth row of Table 2 and Panel (d) of Figure 2 reveal that measured productivity, which is known to be procyclical, follows a pattern resembling

that of output, with no significant changes observed from peak to recovery during financial crises.

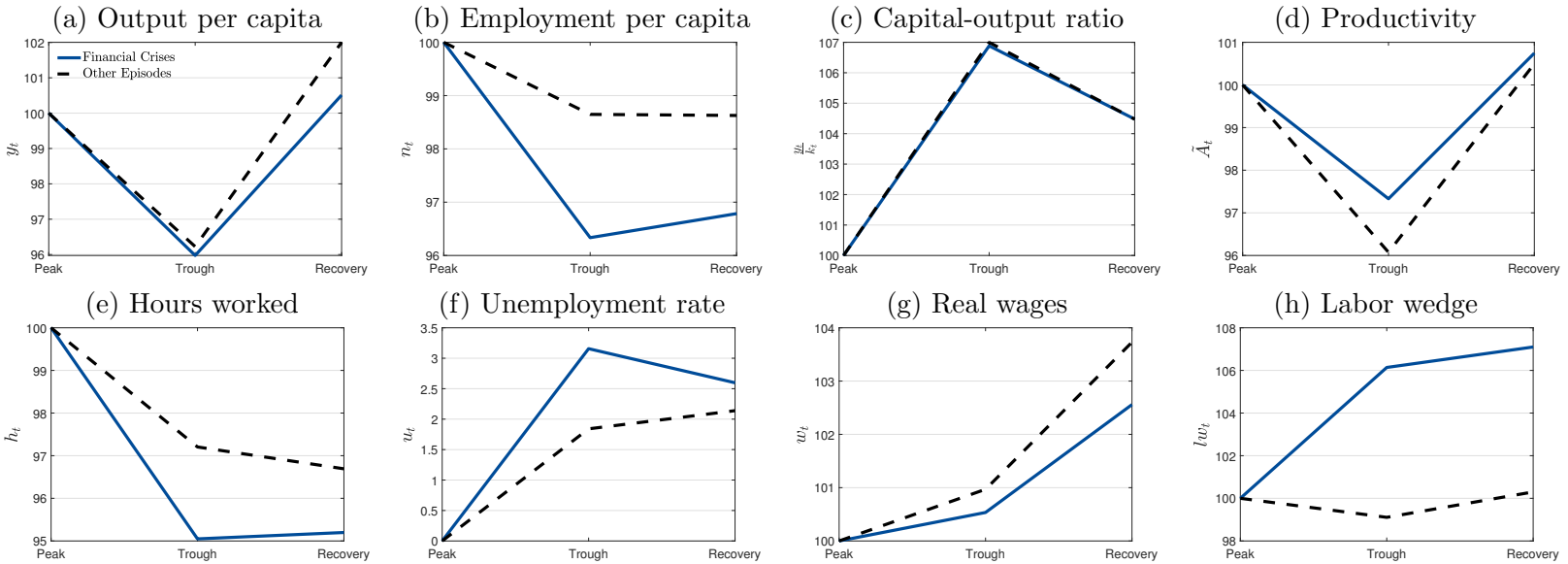
To further analyze the jobless recoveries observed following financial crises, Panel (b) of Table 2 and the bottom panels of Figure 2 examine the recovery of additional labor market variables, which yields three key results. First, the phenomenon of jobless recoveries following financial crises is also observed in hours worked and the unemployment rate. Specifically, when output returns to its pre-crisis level, hours worked remain 5% below their pre-crisis level and the unemployment rate is 3 percentage points above its pre-crisis level. There is also a small decline in participation rates, although this difference is not statistically significant. Second, despite the jobless recovery, real wages increase throughout the episode, ending up 2% above their pre-crisis level at the recovery point. Third, there is a sizable increase in the labor wedge, which is 7% above its pre-crisis level at the recovery point.

Comparison with other recessions. To put the accounting exercise during financial crises into perspective, Figure 2 compares the dynamics during financial crises with those observed in other large recession episodes. Complementing this, Appendix Table 5 presents these differences in a regression format under alternative specifications (i.e., including time trends, post-1990 fixed effects, or country fixed effects) and alternative samples (i.e., including "mild" recession episodes or excluding global financial crisis episodes).

The main distinguishing aspect of the recovery from financial crises relative to other large recession episodes is the labor input, which contracts more severely in financial crises than in other recession episodes and remains 2% below that in large recession episodes at the recovery point. The capital-output ratio exhibits remarkable similarities, while measured productivity shows less pronounced contractions and slightly higher recovery in financial crises, although the difference is not statistically significant.[4] In terms of other labor market variables, a significant difference appears in the labor wedge, which increases sharply during financial crises but remains fairly stable in other large recession episodes.

[4]This smaller decline in productivity during financial crises is consistent with models that attribute the source of the contraction during financial crises to factors other than productivity (e.g., "financial shocks," as in Jermann and Quadrini, 2012; Khan and Thomas, 2013).

Figure 2: Recovery from Financial Crises in Developed-Market Economies



Notes: This figure reports the dynamics of GDP over the working-age population, employment over the working-age population, the capital-output ratio, measured productivity, hours worked over the working-age population, the unemployment rate, real wages, and the labor wedge during financial crises and other large recessions in developed-market economies. Each variable is indexed to 100 at the peak of each episode, except for the unemployment rate, which is expressed as deviations from its peak value. Each plot shows the average values of the respective variable at the recession peak, trough, and recovery point. The solid blue line represents financial crises and the dotted black line represents other large recession episodes. Further details on the definitions of financial crises are provided in Section 2.1. For additional information on the variables and data sources, see Appendix A.

3. The Role of Inflation: Evidence From Emerging-Markets

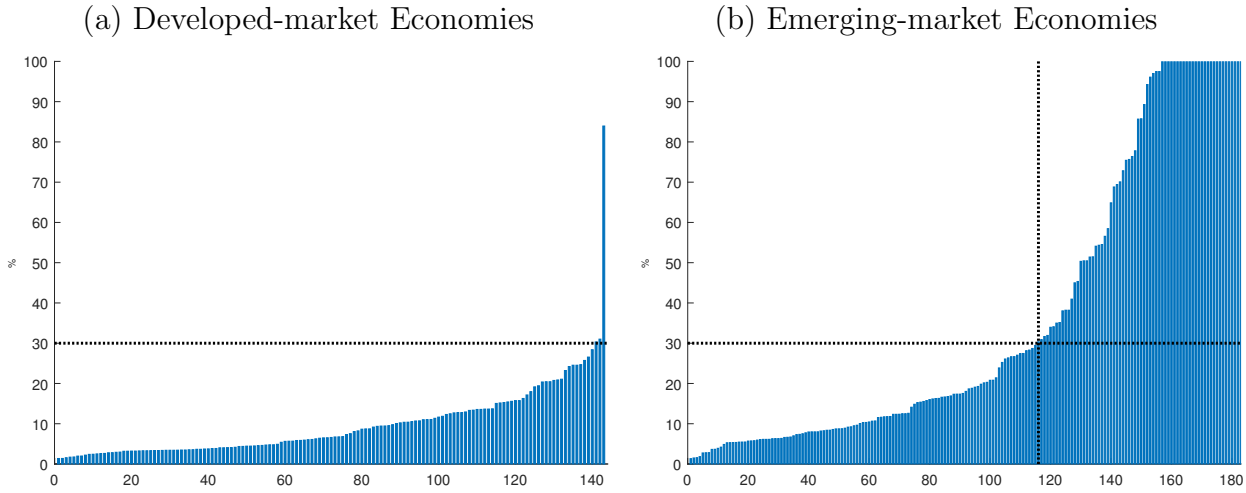
Emerging-market sample. In this section, we extend our analysis to include emerging-market economies. Our emerging-market sample consists of 35 middle-income economies: Algeria, Argentina, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Dominican Republic, Ecuador, Egypt, El Salvador, Hungary, Indonesia, Ivory Coast, Lebanon, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Panama, Peru, Philippines, Poland, Russia, South Africa, South Korea, Thailand, Tunisia, Turkey, Ukraine, Uruguay, and Venezuela.[5]

Using this sample of countries and the same procedure as in Section 2.1, we identify 196 recession episodes in emerging markets (detailed in Appendix Tables 6–8), 53% of which are financial crises. Appendix Table 9 provides summary statistics for these episodes. The average per capita output contraction in emerging markets is 7%, more than twice that observed in developed economies. The duration of these episodes is slightly longer than in developed economies, averaging 4 years from peak to recovery. As in developed economies, financial crises in emerging markets are associated with larger output contractions and longer durations, although the differences with non-financial recessions are smaller than those observed in their developed economy counterparts.

Moderate- and high-inflation episodes. It is well known that emerging economies tend to feature higher and more volatile inflation rates than developed economies (for a recent study, see Blanco, Ottonello and Ranosova, 2022, and references therein). Figure 3 illustrates this phenomenon in our sample of recession episodes, reporting the inflation rates reached during these episodes (after winsorizing rates above 100 %). In developed-economy recession episodes, the average annual inflation rate reached is 10%, with a standard deviation of 9%. In emerging markets, this average is 36%, with a standard deviation of 35%. This variation allows us to explore how labor market recoveries differ depending on the inflation rates experienced during the episode. For this purpose, we define "moderate" inflation

[5]This selection of emerging-market economies follows the study by Calvo, Izquierdo and Talvi (2006), which focused on sudden-stop episodes and included economies integrated into international capital markets, as indicated by their inclusion in JPMorgan's EMBI.

Figure 3: Inflation during Recession Episodes



Notes: This figure illustrates the maximum annual inflation rate observed between the peak and recovery years of each recession episode for developed-market economies (Panel (a)) and emerging-market economies (Panel (b)). The horizontal line marks an inflation rate of 30%, which defines the threshold used to classify episodes into moderate- and high-inflation groups. In Panel (b), the vertical line separates emerging-market episodes into these two groups. Episodes included in the analysis are detailed in Appendix Tables 3–8.

episodes as those with maximum inflation rates below 30% (in the spirit of Dornbusch and Fischer, 1993), and classify the rest as "high-inflation" episodes. Moderate-inflation episodes (detailed in Appendix Tables 6 and 7) reach average annual inflation rates of 12%, with a standard deviation of 9%, which renders this set comparable in terms of inflation outcomes to developed economies. High-inflation episodes (detailed in Appendix Table 8) reach average inflation rates of 76 %, with a standard deviation of 26%. Appendix Table 9 shows that within emerging-market financial crises, 54% are high-inflation episodes, which tend to feature substantially higher output contractions than moderate-inflation episodes (9% vs. 6%) and slightly longer durations.

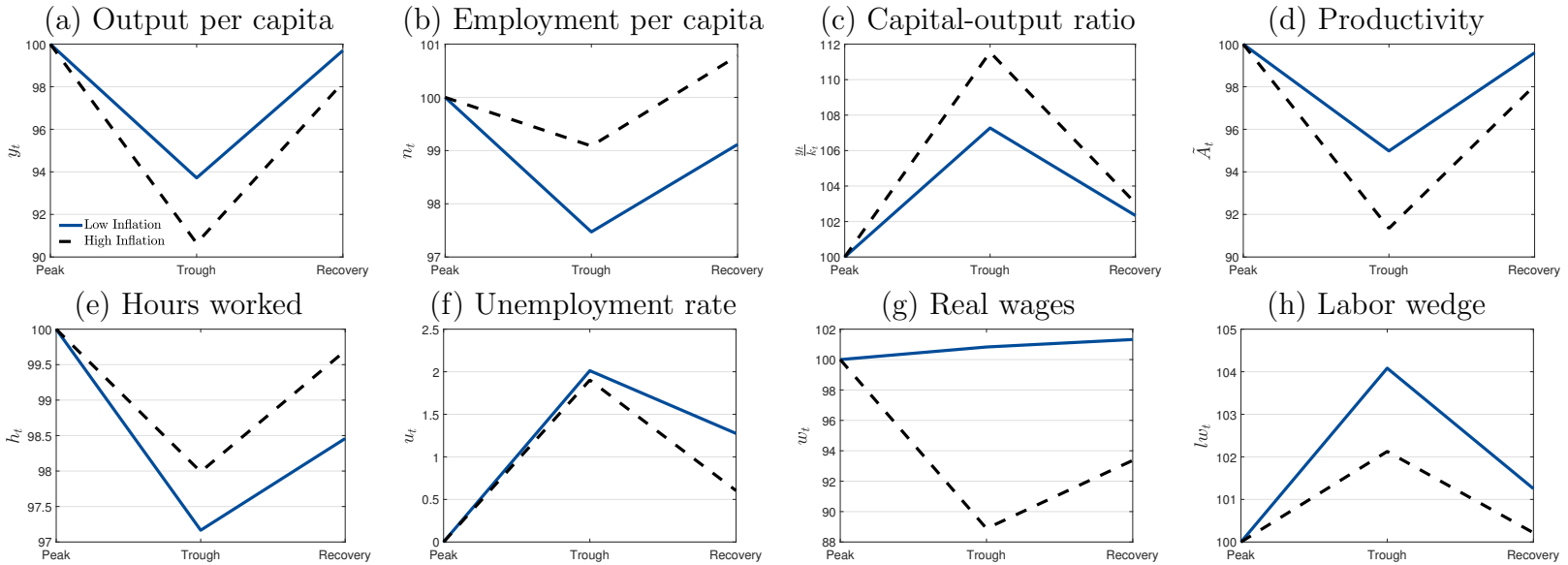
Empirical results. The second and third columns of Table 2 and Figure 4 characterize the recovery from financial crises in emerging markets under alternative inflation environments, with two main results. First, similar to the patterns documented in developed markets, moderate-inflation financial crises in emerging markets are characterized by jobless recoveries,

the resilience of capital stocks, and no declines in real wages. These episodes exhibit two key differences compared with developed economies. First, jobless recoveries are more markedly observed in unemployment rates than in employment or hours worked. Related to this, emerging-market economies feature significant increases in participation rates throughout the episode, in contrast to developed market episodes. Second, the labor wedge does not exhibit substantial adjustments, which suggests that the increase in labor market distortions during financial crises is larger for developed economies than for emerging economies.

Our second key result is that high-inflation episodes exhibit a markedly different pattern of labor market recovery. On the one hand, they do not show signs of jobless recoveries, since employment, hours worked, and unemployment rates largely recover their pre-crisis levels once output returns to its pre-crisis level. On the other hand, they experience a sizable decline in real wages, which do not recover their pre-crisis levels even after output has fully recovered. In this sense, these episodes feature a "wageless recovery."[6]

[6]In addition to the labor market patterns, high-inflation episodes are characterized by a weaker recovery in measured productivity. While lower productivity growth can contribute to the lack of recovery in real wages, it is harder to connect it simultaneously to the strong employment recovery observed in these episodes.

Figure 4: Recovery from Financial Crises in Emerging Markets: Moderate vs. High Inflation



Notes: This figure reports the dynamics of GDP over the working-age population, employment over the working-age population, the capital-output ratio, measured productivity, hours worked over the working-age population, the unemployment rate, real wages, and the labor wedge during financial crises in emerging markets. The analysis focuses on episodes characterized by "moderate inflation" (solid blue line) and "high inflation" (dashed black line). Moderate-inflation episodes are defined as those with a maximum annual CPI inflation below 30 %, while high-inflation episodes have a maximum annual CPI inflation above 30 %. For each crisis episode, variables are indexed to 100 at the recession peak, except for the unemployment rate, which is expressed as deviations from its value at the peak of each recession episode. The plots display the average value of each variable during the recession peak, trough, and recovery points for moderate- and high-inflation episodes. Further details on the definitions of financial crises and other recession episodes are provided in Section 2.1. The financial crises episodes are listed in Appendix Tables 6-8. For additional information on the variables and data sources, see Appendix A.

4. Conclusion

In this paper, we documented two key facts about labor market recovery from economic crises. First, disruptions in credit markets tend to have persistent effects on the labor market, manifesting in either low employment or real wages. Second, the type of adjustment depends on the level of inflation, with low-inflation financial crises being followed by jobless recoveries and high-inflation episodes by wageless recoveries.

Our findings have two broader implications. From a positive perspective, they raise the question of why financial crises disproportionately affect labor relative to capital. Macro-finance models frequently focus on the impact of credit market disruptions on capital accumulation, which typically involves large initial investments and is directly tied to credit. However, labor—despite not requiring such large upfront credit needs—appears to be more affected by credit market disruptions than capital. Understanding this disproportionate impact represents a promising avenue for future research in this area.

From a policy perspective, our findings shed light on two key debates surrounding the last U.S. recession. First, policies aimed at stabilizing credit markets, which were swiftly implemented by the Federal Reserve at the beginning of the recession, may have played a critical role in supporting employment recovery by mitigating increases in labor input costs. Second, the inflation surge following the recession, while costly in several dimensions, might have contributed to a faster recovery in employment compared with previous recessions. Further research that combines our empirical findings with macroeconomic models could shed light on the role of these policies in shaping labor market recoveries from economic crises.

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A. Data description

Data sources. The data used in the empirical analysis of Section 2 were obtained from the following sources:

1. GDP: Measured at constant national prices, obtained from Penn World Tables, version 9.1 (henceforth PWT; variable name: *rgdpna*).

2. Total population: Obtained from PWT (variable name: *pop*).

3. Working-age population ratio: Population aged 15–64 divided by total population, obtained from the OECD and WDI.

4. Employment: Number of individuals engaged, obtained from PWT (variable name: *emp*).

5. Capital stock: Measured at constant national prices, obtained from PWT (variable name: *rnna*).

6. Labor share: Share of labor compensation in GDP at current national prices, obtained from PWT (variable name: *labsh*).

7. Average hours worked: Average annual hours worked by persons engaged, obtained from PWT (variable name: *avh*).

8. Real consumption: Real consumption at constant 2011 national prices, obtained from PWT (variable name: *rconna*).

9. Nominal wages: Obtained primarily from The Conference Board's International Labor Comparisons program (henceforth ILC, January 2020). Refers to labor cost per hour worked for all manufacturing, expressed in national currency. For recession episodes with no available data, data from the WEO were used.

10. Consumer Price Index: Obtained from the IMF using the IFS query tool.

11. Unemployment rate: Measured as the share of the labor force that is unemployed, obtained from WDI and WEO.

The data used in the empirical analysis of Section 3 were obtained, for most variables, from the same sources described previously for developed-market economies. One exception is nominal wages, which, for countries with no available data from the OECD or ILC, were sourced from national datasets. For the countries in our sample that were members of the Soviet Union (i.e., Bulgaria, Czech Republic, Croatia, Hungary, Poland, Russia, and Ukraine), data prior to 1994 were excluded to remove recession episodes associated with the transition from Soviet to market economies in the early 1990s, as well as any recessions occurring during their Soviet period.

Constructed Variables. Based on the raw data, we constructed the following variables for the empirical analysis:

i. Real GDP over working-age population (y_{it}): Constructed as (1)/((2)×(3)).

ii. Employment over working-age population (l_{it}): Constructed as (4)/((2)×(3)).

iii. Capital stock over working-age population (k_{it}): Constructed as (5)/((2)×(3)).

iv. Labor share ($1 - \alpha_i$): Constructed as the average of (6) over all years with available data.

v. Hours worked over working-age population: Constructed as (4)×(7)/((2)×(3)).

vi. Consumption over working-age population (h_{it}): Constructed as (8)/((2)×(3)).

vii. Total factor productivity: Constructed as $A_{it} = y_{it}/(k_{it}^{\alpha_i} l_{it}^{1-\alpha_i})$.

viii. Real wages (w_{it}): Constructed as (9)/(10).

B. Additional figures and tables

Table 3: Sample of Recession Episodes in Developed Market Economies (Part I)

Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis	Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis
Australia	1951	1952	-5.4	2	0	Germany	1992	1993	-1.4	2	0
Australia	1955	1956	-1.5	3	0	Germany	2002	2003	-0.5	2	0
Australia	1960	1961	-0.7	2	0	Germany	2008	2009	-5.2	3	1
Australia	1964	1965	-0.1	2	0	Greece	1951	1952	-3.3	2	0
Australia	1973	1974	-0.4	2	0	Greece	1961	1962	-0.5	2	0
Australia	1976	1977	-0.7	2	0	Greece	1973	1974	-7.2	3	0
Australia	1981	1982	-3.8	3	0	Greece	1979	1987	-8.9	10	0
Australia	1989	1991	-2.5	3	1	Greece	1989	1990	-1.2	2	1
Australia	2007	2008	-0.1	2	0	Greece	1991	1993	-3.4	5	1
Austria	1974	1975	-0.7	2	0	Greece	2007	2013	-25.3	9	1
Austria	1977	1978	-0.8	2	0	Iceland	1950	1952	-4.8	3	0
Austria	1980	1981	-1.2	3	0	Iceland	1956	1957	-1.4	2	0
Austria	1983	1984	-1.0	2	0	Iceland	1960	1961	-1.5	2	0
Austria	1992	1993	-0.1	2	0	Iceland	1966	1968	-10.2	5	0
Austria	2008	2009	-4.1	3	1	Iceland	1974	1975	-1.4	2	0
Austria	2012	2013	-0.4	3	1	Iceland	1982	1983	-3.5	3	1
Belgium	1957	1958	-0.6	2	0	Iceland	1987	1989	-2.6	3	1
Belgium	1974	1975	-2.1	2	0	Iceland	1990	1992	-5.4	6	1
Belgium	1976	1977	-0.2	2	0	Iceland	2001	2002	-0.3	2	0
Belgium	1980	1983	-1.5	4	0	Iceland	2007	2010	-11.9	9	1
Belgium	1992	1993	-1.1	2	0	Ireland	1951	1952	-1.0	2	0
Belgium	2007	2009	-3.0	4	1	Ireland	1955	1957	-4.1	4	0
Belgium	2011	2012	0.0	2	1	Ireland	1965	1965	0.0	2	0
Canada	1953	1954	-3.3	2	0	Ireland	1975	1976	-0.5	2	0
Canada	1956	1958	-0.8	3	0	Ireland	1982	1983	-1.4	2	0
Canada	1966	1967	-0.1	2	0	Ireland	1985	1986	-1.0	2	0
Canada	1974	1975	-0.6	2	0	Ireland	2007	2009	-10.9	7	1
Canada	1981	1982	-4.4	3	1	Italy	1974	1975	-2.5	2	0
Canada	1989	1992	-4.1	5	0	Italy	1980	1983	-1.2	4	0
Canada	2007	2009	-4.2	4	0	Italy	1992	1993	-0.8	2	1
Denmark	1950	1951	-2.0	3	0	Italy	2002	2003	-0.1	2	0
Denmark	1954	1955	-0.9	2	0	Italy	2007	2013	-8.0	9	1
Denmark	1973	1975	-3.1	3	0	Japan	1973	1974	-2.2	3	0
Denmark	1979	1981	-2.5	3	0	Japan	1992	1993	-0.8	2	1
Denmark	1986	1988	-0.6	4	1	Japan	1997	1999	-1.0	3	1
Denmark	1992	1993	-0.4	2	1	Japan	2007	2009	-4.9	5	0
Denmark	2007	2009	-5.9	8	1	Luxembourg	1950	1951	-5.2	2	0
Finland	1952	1953	-1.2	2	0	Luxembourg	1953	1954	-1.1	2	0
Finland	1956	1958	-1.0	3	0	Luxembourg	1974	1975	-7.9	4	0
Finland	1990	1993	-10.7	7	1	Luxembourg	1980	1981	-1.3	3	0
Finland	2008	2009	-8.5	3	0	Luxembourg	2007	2012	-11.4	7	0
Finland	2011	2014	-1.3	5	0	Netherlands	1957	1958	-2.2	2	0
France	1974	1975	-1.8	2	0	Netherlands	1974	1975	-1.5	2	0
France	1980	1981	-0.2	2	0	Netherlands	1980	1982	-4.3	6	0
France	1982	1983	0.0	2	0	Netherlands	2001	2003	-0.6	3	0
France	1992	1993	-0.9	2	1	Netherlands	2008	2009	-3.9	6	1
France	2007	2009	-3.4	4	1	New Zealand	1950	1952	-4.4	4	0
Germany	1974	1975	-1.1	2	1	New Zealand	1955	1956	-0.2	2	0
Germany	1980	1982	-1.9	4	1	New Zealand	1957	1958	-1.2	2	0

Notes: This table reports the sample of developed-market recession episodes used in the empirical analysis in Section 2.1. GDP change *P-T* refers to the contraction in real GDP per capita from the recession peak to trough (expressed in percentages). Duration *P-R* indicates the number of years between the peak and

the recovery of GDP per capita. Financial crisis is a dummy variable that takes the value of 1 if the identified recession coincides with a financial crisis and 0 otherwise.

Table 4: Sample of Recession Episodes in Developed Market Economies (Part II)

Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis	Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis
New Zealand	1961	1962	-0.4	2	0	Sweden	1976	1977	-1.8	3	0
New Zealand	1966	1968	-8.4	3	0	Sweden	1990	1993	-5.6	5	1
New Zealand	1969	1970	-2.2	3	0	Sweden	2007	2009	-6.9	4	1
New Zealand	1974	1978	-9.5	9	0	Sweden	2011	2012	-0.4	2	1
New Zealand	1986	1987	-5.2	2	1	Switzerland	1951	1952	-0.2	2	0
New Zealand	1988	1992	-3.8	5	1	Switzerland	1957	1958	-3.5	2	0
New Zealand	2007	2008	-2.6	5	0	Switzerland	1974	1976	-9.1	6	0
Norway	1981	1982	-0.4	2	0	Switzerland	1981	1983	-2.9	4	0
Norway	1987	1988	-0.9	3	1	Switzerland	1990	1993	-3.6	8	0
Norway	2007	2011	-4.3	8	0	Switzerland	2001	2003	-1.4	3	0
Norway	2015	2016	-0.1	2	0	Switzerland	2008	2009	-3.3	5	1
Portugal	1973	1975	-6.5	4	0	United Kingdom	1968	1969	-0.8	2	0
Portugal	1982	1984	-3.6	4	0	United Kingdom	1973	1975	-4.4	5	1
Portugal	1992	1993	-2.8	3	0	United Kingdom	1979	1981	-3.7	4	1
Portugal	2002	2003	-1.2	2	0	United Kingdom	1990	1991	-1.0	3	1
Portugal	2008	2009	-2.9	2	1	United Kingdom	2007	2009	-6.2	7	1
Portugal	2010	2013	-5.8	5	1	United States	1953	1954	-1.3	2	0
Portugal	2015	2016	-0.6	2	1	United States	1957	1958	-1.9	2	0
Spain	1952	1953	-4.2	2	0	United States	1969	1970	-1.6	2	0
Spain	1958	1959	-3.4	2	0	United States	1973	1975	-4.0	4	0
Spain	1974	1975	-0.6	2	1	United States	1979	1982	-2.8	4	1
Spain	1978	1981	-1.5	7	1	United States	1990	1991	-0.8	2	1
Spain	1992	1993	-1.8	3	0	United States	2000	2001	-0.3	2	0
Spain	2007	2013	-7.7	9	1	United States	2007	2009	-4.2	5	1

Notes: This table details the sample of developed-market recession episodes used in the empirical analysis in Section 2.1. GDP change *P-T* refers to the contraction in real GDP per capita from the recession peak to the trough (expressed in percentages). Duration *P-R* indicates the number of years between the peak and the recovery of GDP per capita. Financial crisis is a dummy variable that takes the value of 1 if the identified recession coincides with a financial crisis and 0 otherwise.

Table 5: Recovery from Financial Crises: Comparison with Other Recession Episodes

	Output	Employment	Captial/ output	Productivity	Hours worked	Unemployment rate	Real wages	Labor wedge
(a) Baseline	-0.014*	-0.020**	-0.004	0.005	-0.017*	0.003	-0.008	0.057***
	[0.007]	[0.008]	[0.011]	[0.009]	[0.010]	[0.006]	[0.019]	[0.022]
(b) Time controls								
Time quadratic trend	-0.002	-0.020**	-0.012	0.014	-0.013	0.003	-0.000	0.054**
	[0.008]	[0.009]	[0.012]	[0.010]	[0.011]	[0.006]	[0.019]	[0.022]
Post-1990 fixed effect	-0.008	-0.028***	-0.003	0.013	-0.027**	0.006	-0.000	0.077***
	[0.008]	[0.009]	[0.012]	[0.010]	[0.011]	[0.006]	[0.020]	[0.022]
(c) Country fixed effects	-0.022***	-0.027***	0.002	0.002	-0.026**	0.004	-0.015	0.068***
	[0.008]	[0.008]	[0.012]	[0.009]	[0.011]	[0.006]	[0.015]	[0.020]
(d) Alternative samples								
Including mild recessions	-0.017***	-0.020***	0.006	-0.001	-0.019**	0.007*	-0.009	0.050***
	[0.006]	[0.006]	[0.008]	[0.007]	[0.008]	[0.004]	[0.013]	[0.015]
Pre-2007 sample	-0.011*	-0.034***	-0.006	0.016*	-0.028**	0.007	-0.014	0.079***
	[0.006]	[0.009]	[0.011]	[0.009]	[0.012]	[0.007]	[0.022]	[0.022]

Notes: This table presents the results of estimating $\Delta_{t_R(i,j)-t_P(i,j)} Z_{i,t} = \alpha + \beta \text{financial}_{i,j} + \gamma' X_{i,t_P(i,j)} + \epsilon_{i,j}$ in a sample of recession episodes, where $Z_{i,t}$ represents one of the following variables: the log of GDP over working-age population, the log of employment over working-age population, the log of the capital-output ratio, the log of measured productivity, the log of hours worked over working-age population, the unemployment rate, the log of real wages, or the log of the labor wedge for episode j in country i. The terms $\{t_P(i,j), t_R(i,j)\}$ denote the output peak and recovery point of each episode j in country i, $\text{financial}_{i,j}$ is a dummy variable indicating whether the episode is classified as a financial crisis, and $X_{i,t_P(i,j)}$ is a vector of controls linked to the country and the period in which the episode occurs. Panel (a) shows the baseline regression (corresponding to Figure 2), with no controls. Panel (b) estimates the regression including time controls in the vector $X_{i,t_P(i,j)}$, either a quadratic time trend (i.e., $\theta_1 t_P(i,j) + \theta_2 t_P(i,j)^2$) or a dummy variable equal to one if the recession peak occurs in 1990 or later (i.e., $\mathbb{I}\{t_P(i,j) \geq 1990\}$). Panel (c) includes country fixed effects α_i. Panel (d) estimates the baseline specification but for alternative samples: one including "mild recessions" and another excluding episodes with a peak in 2007 or later. The episodes included in the analysis are detailed in Appendix Tables 3 and 4, and specify whether each episode is a financial crisis. For the definition of financial crises and other episodes, see Section 2.1. $*$, $**$, and $***$ represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6: Sample of Moderate Inflation Recession Episodes in Emerging Markets (Part I)

Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis	Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis
Algeria	1960	1962	-37.5	5	0	Egypt	1965	1967	-5.3	4	0
Algeria	1965	1966	-8.7	3	0	Egypt	1972	1973	-1.9	3	0
Algeria	1970	1971	-12.0	2	0	Egypt	1985	1986	-0.7	2	1
Algeria	1979	1981	-2.9	3	0	Egypt	2010	2011	-0.3	2	0
Algeria	1985	1988	-11.3	4	1	El Salvador	1960	1961	-1.1	2	0
Algeria	2005	2006	-0.6	2	0	El Salvador	1967	1969	-1.9	4	0
Algeria	2008	2009	-0.3	2	0	El Salvador	2008	2009	-4.3	8	0
Argentina	1994	1995	-4.3	2	1	Hungary	1995	1995	0.0	2	1
Argentina	2008	2009	-7.2	2	1	Hungary	2008	2009	-6.4	6	1
Brazil	1997	1999	-4.2	7	1	Indonesia	1981	1982	-0.7	2	0
Brazil	2008	2009	-1.6	2	0	Indonesia	1984	1985	-0.5	2	0
Bulgaria	2008	2009	-2.6	2	0	Lebanon	1973	1976	-71.2	6	0
Chile	1964	1965	-1.4	2	1	Lebanon	1996	1997	-3.2	2	0
Chile	1998	1999	-2.4	2	0	Lebanon	1998	2006	-7.5	10	0
Chile	2008	2009	-3.0	2	0	Malaysia	1974	1975	-2.4	2	0
China	1960	1961	-17.3	4	0	Malaysia	1984	1986	-5.9	4	1
China	1966	1968	-7.4	4	0	Malaysia	1997	1998	-10.3	3	1
China	1971	1972	-0.8	2	0	Malaysia	2000	2001	-2.2	2	1
China	1975	1976	-5.6	3	0	Malaysia	2008	2009	-3.9	2	0
China	1980	1980	-0.2	2	0	Mexico	2000	2003	-4.7	4	1
China	1988	1990	-3.4	4	1	Mexico	2007	2009	-8.4	8	0
Colombia	1964	1965	-2.0	2	0	Morocco	1964	1966	-7.4	5	0
Colombia	1980	1983	-4.4	7	1	Morocco	1977	1978	-1.2	2	0
Colombia	1997	1999	-7.4	8	1	Morocco	1980	1981	-5.7	2	1
Colombia	2008	2009	-0.2	2	0	Morocco	1982	1983	-3.5	3	1
Croatia	2008	2012	-9.2	8	0	Morocco	1986	1987	-4.9	2	1
Czech Rep.	1990	1993	-13.8	5	0	Morocco	1988	1988	0.0	2	1
Czech Rep.	1996	1998	-1.6	4	0	Morocco	1991	1993	-9.2	3	1
Czech Rep.	2008	2009	-5.0	6	0	Morocco	1994	1995	-8.8	2	0
Côte d'Ivoire	1961	1962	-3.0	2	0	Morocco	1996	1997	-4.5	2	0
Côte d'Ivoire	1964	1965	-6.6	2	0	Morocco	1998	2000	-2.3	3	0
Côte d'Ivoire	1966	1967	-0.6	2	0	Nigeria	1960	1961	-6.5	2	0
Côte d'Ivoire	1971	1972	-0.5	2	0	Nigeria	1964	1968	-31.1	7	0
Côte d'Ivoire	1973	1974	-0.6	2	0	Pakistan	1970	1972	-1.6	3	0
Côte d'Ivoire	1978	1988	-36.2	11	1	Pakistan	1992	1993	-0.8	2	0
Côte d'Ivoire	1989	1994	-17.4	7	1	Pakistan	1996	1998	-2.1	7	0
Côte d'Ivoire	1998	2007	-13.8	11	1	Pakistan	2007	2010	-2.4	7	0
Côte d'Ivoire	2009	2011	-7.4	4	1	Panama	1973	1977	-5.9	5	0
Dominican Rep.	1960	1961	-4.4	2	0	Panama	1982	1984	-5.4	3	1
Dominican Rep.	1964	1965	-13.7	6	0	Panama	1987	1989	-13.9	5	1
Dominican Rep.	1977	1978	-1.2	3	1	Panama	1994	1995	-0.8	3	1
Dominican Rep.	1981	1982	-1.3	2	1	Panama	2000	2002	-1.7	3	0
Dominican Rep.	2000	2001	-0.22	2	1	Panama	2008	2009	-0.71	2	0
Dominican Rep.	2008	2009	-1.03	2	0	Peru	1967	1968	-2.57	3	1
Ecuador	1962	1963	-0.27	2	0	Peru	1997	2001	-4.04	6	1
Ecuador	1965	1966	-0.41	2	0	Peru	2008	2009	-0.50	2	0
Ecuador	1968	1969	-1.09	2	0	Philippines	1969	1969	-0.02	2	0
Ecuador	1976	1977	-1.55	2	0	Philippines	1990	1993	-6.48	6	1
Ecuador	2008	2009	-1.56	3	1	Philippines	1997	1998	-3.09	5	1
Egypt	1961	1962	-0.28	2	0	Philippines	2008	2009	-1.37	2	0

This table details the sample of moderate-inflation emerging-market recession episodes used in the empirical analysis in Section 3. GDP change P-T refers to the contraction in real GDP per capita from the recession peak to the trough (expressed in percentages). Duration P-R indicates the number of years between the peak and the recovery of GDP per capita. Financial crisis is a dummy variable that takes the value of 1 if the identified recession coincides with a financial crisis and 0 otherwise.

Table 7: Sample of Moderate Inflation Recession Episodes in Emerging Markets (Part II)

Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis	Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis
Rep. of Korea	1961	1962	-0.5	2	0	Tunisia	1966	1967	-2.6	2	0
Rep. of Korea	1979	1980	-4.2	3	1	Tunisia	1972	1973	-3.3	2	0
Rep. of Korea	1997	1998	-6.9	2	1	Tunisia	1981	1982	-4.0	3	1
Russian Fed.	2008	2009	-8.0	3	1	Tunisia	1985	1986	-5.0	5	1
Russian Fed.	2014	2015	-1.7	3	0	Tunisia	1992	1995	-1.2	4	1
South Africa	1971	1972	-1.2	2	0	Tunisia	2001	2002	-0.2	2	0
South Africa	1974	1977	-4.2	6	1	Tunisia	2010	2011	-3.1	3	0
South Africa	1981	1983	-7.0	3	1	Turkey	1960	1961	-0.6	2	1
South Africa	1984	1987	-5.8	4	1	Turkey	2007	2009	-6.9	4	0
South Africa	1988	1995	-13.4	8	1	Ukraine	2008	2009	-14.9	3	0
South Africa	1996	1999	-2.7	6	0	Uruguay	1998	2002	-15.7	9	1
South Africa	2008	2009	-2.9	2	0	Uruguay	2014	2015	-0.1	2	0
Thailand	1996	1998	-13.4	7	1	Venezuela	1965	1966	-4.2	3	0
Thailand	2008	2009	-1.4	2	0	Venezuela	1970	1972	-0.8	3	0

Notes: This table details the sample of moderate-inflation emerging-market recession episodes used in the empirical analysis of Section 3. GDP change *P-T* refers to the contraction in real GDP per capita from the recession peak to the trough (expressed in percentages). Duration *P-R* indicates the number of years between the peak and the recovery of GDP per capita. Financial crisis is a dummy variable that takes the value of 1 if the identified recession coincides with a financial crisis and 0 otherwise.

Table 8: Sample of High Inflation Recession Episodes in Emerging Markets

Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis	Country	Peak	Trough	GDP change P-T	duration P-R	Financial crisis
Algeria	1989	1997	-17.9	14	1	Lebanon	1981	1982	-37.3	3	0
Argentina	1961	1963	-6.1	4	1	Lebanon	1985	1986	-7.4	2	0
Argentina	1965	1966	-1.2	2	1	Lebanon	1987	1989	-59.2	4	0
Argentina	1974	1976	-3.0	3	0	Mexico	1981	1983	-10.9	3	1
Argentina	1977	1978	-4.1	2	1	Mexico	1984	1988	-9.4	7	1
Argentina	1980	1982	-10.4	3	1	Mexico	1994	1995	-8.5	3	1
Argentina	1984	1985	-8.2	2	1	Nigeria	1974	1975	-1.8	2	0
Argentina	1987	1990	-13.8	5	1	Nigeria	1977	1984	-27.0	12	1
Argentina	1998	2002	-22.9	8	1	Nigeria	1990	1999	-7.4	12	1
Argentina	2011	2012	-2.2	2	1	Peru	1975	1978	-9.7	5	1
Brazil	1980	1983	-13.7	6	1	Peru	1981	1985	-15.9	5	1
Brazil	1987	1988	-2.4	2	1	Peru	1987	1992	-32.8	7	1
Brazil	1989	1992	-10.6	5	1	Philippines	1982	1985	-20.5	7	1
Brazil	1995	1996	-0.1	2	1	Russian Fed.	1997	1998	-5.9	3	1
Bulgaria	1995	1999	-10.2	7	0	Turkey	1977	1980	-8.9	9	1
Chile	1969	1970	-0.2	2	1	Turkey	1987	1989	-2.8	3	1
Chile	1971	1975	-25.4	7	1	Turkey	1990	1991	-1.5	2	1
Chile	1981	1983	-19.5	8	1	Turkey	1993	1994	-7.6	3	1
Colombia	1974	1975	-1.1	3	0	Turkey	1998	1999	-5.3	2	1
Colombia	1990	1991	-0.2	2	0	Turkey	2000	2001	-7.7	4	1
Dominican Rep.	1983	1985	-6.3	4	1	Uruguay	1961	1963	-4.2	3	1
Dominican Rep.	1987	1988	-0.4	2	1	Uruguay	1964	1965	-1.8	2	1
Dominican Rep.	1989	1991	-8.8	4	1	Uruguay	1966	1967	-3.6	3	1
Dominican Rep.	2002	2004	-2.8	3	1	Uruguay	1970	1972	-1.5	4	1
Ecuador	1981	1987	-8.7	10	1	Uruguay	1981	1984	-17.0	6	1
Ecuador	1991	1993	-1.5	3	1	Uruguay	1987	1988	-0.6	3	1
Ecuador	1994	1996	-1.2	3	1	Uruguay	1994	1995	-2.2	2	0
Ecuador	1998	2000	-8.0	6	1	Venezuela	1977	1985	-27.1	11	1
El Salvador	1978	1989	-30.1	15	1	Venezuela	1988	1989	-11.1	3	1
Indonesia	1961	1963	-6.2	3	0	Venezuela	1992	1994	-7.4	3	1
Indonesia	1964	1965	-0.2	2	1	Venezuela	1995	1996	-2.8	2	1
Indonesia	1966	1966	-0.1	2	1	Venezuela	1997	1999	-10.2	4	1
Indonesia	1968	1969	-1.1	2	1	Venezuela	2001	2003	-19.9	5	1
Indonesia	1997	1999	-15.9	8	1	Venezuela	2008	2010	-8.1	3	0

Notes: This table details the sample of high-inflation emerging-market recession episodes used in the empirical analysis of Section 3. GDP change *P-T* refers to the contraction in real GDP per capita from the recession peak to the trough (expressed in percentages). Duration *P-R* indicates the number of years between the peak and the recovery of GDP per capita. Financial crisis is a dummy variable that takes the value of 1 if the identified recession coincides with a financial crisis and 0 otherwise.

Table 9: Summary Statistics of Recession Episodes in Emerging Markets

	All episodes	Financial crises	Inflation episodes	
			Moderate	High
(a) Output per capita contraction (%)				
Mean	7.0	8.0	6.3	9.4
Median	4.2	5.9	4.8	7.7
Std. dev.	9.5	7.6	6.2	8.4
Min	0.0	0.0	0.0	0.1
Max	71.2	36.2	36.2	32.8
(b) Duration from peak to recovery (years)				
Mean	3.9	4.6	4.3	4.8
Median	3.0	3.0	3.0	3.0
Std. dev.	2.5	2.9	2.4	3.3
Min	2.0	2.0	2.0	2.0
Max	15.0	15.0	11.0	15.0
(c) Duration from trough to recovery (years)				
Mean	1.9	2.2	2.1	2.2
Median	1.0	2.0	2.0	2.0
Std. dev.	1.3	1.4	1.4	1.5
Min	1.0	1.0	1.0	1.0
Max	7.0	6.0	6.0	6.0
Number of episodes	196	105	48	57

Notes: This table presents descriptive statistics of the recession episodes used in the empirical analysis for our sample of emerging-market economies. Panel (a) reports descriptive statistics of the output contraction observed in each episode, measured in percent, from peak to trough. Panels (b) and (c) show the duration from peak to trough and from trough to recovery, respectively, measured in years. The column labeled *All* presents descriptive statistics for the entire set of recession episodes identified using the algorithm described in Section 2.1, and the column labeled *financial crises* represents statistics for the recession episodes classified as financial crises according to the definition provided in Section 2.1. The columns labeled *Moderate inflation* and *High inflation* report statistics for financial crises classified as moderate-and high-inflation episodes. Specifically, the *Moderate* category includes episodes with a maximum annual CPI inflation below 30 %. The *High* category encompasses episodes with maximum annual CPI inflation above 30 %. See Appendix A for further information on the definition of variables and data sources.