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DETERMINANTS OF THE DURATION OF ECONOMIC RECOVERIES: THE ROLE OF 'TOO MUCH FINANCE'

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Determinants of the Duration of Economic Recoveries: The Role of 'Too Much Finance'

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Abstract:
This paper explores the effect of financial development on the duration of economic recoveries, considering a sample of 414 economic recoveries observed in 67 countries during the period 1989-2019. We define the duration of economic recovery, as the time it takes the economy to return to its potential output level. Using a continuous-time Weibull duration model, we find that a higher level of financial development tends to prolong the duration of economic recovery. Therefore, our findings indicate that a too highly developed financial system might delay a full recovery after a recession, supporting the notion that there is 'too much finance'. In particular, greater size of the underregulated sector of non-banking financial institutions (shadow banks) prolongs the economic recovery. Moreover, the emerging economies, with their generally poorer regulatory frameworks, are more negatively affected by 'too much finance'. Underlining the importance of an effective regulation of the entire financial system, our results also confirm that a higher regulátory quality limits the negative consequences of 'too much finance'.

JEL: F10, F30, F31, F43
Keywords: economic recovery, duration analysis, Weibull duration model, financial development, too-much-finance

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1 Introduction

A large number of empirical studies have investigated determinants and predictors of economic crises (Babecky et al., 2013; Bluwstein et al., 2020; Drehmann and Juselius, 2014; Kaminsky and Reinhart, 1999) and their recurrence (Laeven and Valencia, 2020; Nguyen et al., 2022a). It is, however, somewhat surprising that the empirical literature has so far devoted comparatively little attention to studying the determinants of economic recoveries. Nonetheless, the prolonged and uneven recoveries that followed both the Global Financial Crisis of 2008-2009 (GFC) and the COVID-19 recession of early 2020s underline the importance of studying the determinants of robust and speedy economic recoveries from economic crises. This is a gap in the empirical literature that we aim to fill.

The theoretical and empirical literature has already identified numerous determinants of economic growth. Some of the identified drivers of growth include, for instance, the savings rate (Solow, 1956), technological progress (Romer, 1990), human capital (Barro, 1991), undervalued exchange rate (Rodrik, 2008), financial development (King and Levine, 1993), or institutional quality (North and Thomas, 1973). Obviously, many other economic growth drivers have also been proposed over the years. In this study, however, we focus on financial development – in particular on the issue of 'too much finance'.

There is a widely-held belief that a well-developed financial system, by funneling external sources of funding to entrepreneurial economic agents, plays a vital role in stimulating economic development. This view has been well-established in the theoretical economic literature for over a century (Schumpeter, 1911). The first empirical evidence on the positive effect of higher financial development on economic growth was provided by King and Levine (1993). These authors argue that a higher level of financial development contributes to higher economic growth by promoting physical capital accumulation and by improving the economic efficiency of physical capital. The beneficial consequences of higher financial development were also corroborated by other empirical studies (Beck et al., 2000; Levine et al., 2000).

Nonetheless, there are also some empirical studies that failed to find a positive effect of financial development on economic performance (Gregorio and Guidotti, 1995; Rousseau and Wachtel, 2002; Manganelli and Popov, 2015). Arcand et al. (2015) represent a seminal contribution on the negative consequences of too large financial systems for growth. These authors have coined the term 'too much finance' – since their empirical evidence has shown that once the credit to private sector exceeds 100 % of GDP, any

further growth in the size of the financial sector has a detrimental effect on economic growth. Arcand et al. (2015) identify two possible reasons why a too large financial system might have detrimental consequences for economic growth. First, a too large financial system might become too complex, interconnected and volatile (unstable), which might then contribute to higher economic volatility. Second, a too large financial system might have a tendency to overlend, leading to a potential misallocation of resources. Based on a comprehensive review of the literature, Loayza et al. (2018) conclude that 'too much finance' might negatively affect economic growth by crowding out other productive activities and by misallocating resources. Law and Singh (2014) also find empirical evidence supporting the notion that there is 'too much finance'. The empirical finding that there is 'too much finance' is also supported by theoretical literature. A model of Cecchetti and Kharroubi (2019) demonstrates that higher credit growth benefits lower productivity/lower lower return projects – reducing the aggregate productivity growth.

Furthermore, another strand of empirical growth literature underlines the importance of institutions as economic growth drivers. According to Acemoglu et al. (2004), the economic institutions are important for economic growth because they influence the society's economic incentives and the allocation of resources to their most efficient uses. Acemoglu et al. (2001) find strong evidence for a positive effect of stronger institutions on long-term economic performance. Stronger institutions were also found to limit the negative effect of high government debt on economic growth (Masuch et al., 2017). Moreover, according to Acemoglu et al. (2003), weak institutions contribute to higher macroeconomic volatility and make economic crises more likely – with their results indicating that the distortionary macroeconomic policies reflect the weak institutional framework rather than cause macroeconomic volatility and economic crises on their own. In addition, Arestis and Demetriades (1997) and Demetriades and Law (2006) argue that institutional factors might influence the relationship between financial development and economic growth.

The empirical evidence regarding the effect of financial development on economic growth has so far focused primarily on long-term economic growth. However, empirical evidence on the impact of financial development over the short-term remains scarce. In what concerns the duration of economic recoveries, the short-term consequences are more important. Namely, while a higher level of financial development might be beneficial for long-term economic growth, a too developed financial system might indulge in overlending prior to the recession. Consequently, the deleveraging that occurs in the post-crisis period (i.e., during the recovery) might prolong the economic recovery. The empirical literature (Bayoumi, 2001; Jorda et al., 2016) has indeed found evidence that

higher private sector debt before the recession adversely impacts the economic growth in the years following the recession – owing to deleveraging. Higher financial development might thus stimulate long-term economic growth and have sizable welfare gains (Townsend and Ueda, 2010), but also prolong the duration of economic recoveries. This is the primary hypothesis that we aim to explore in this paper. That is, we aim to study, whether the issue of 'too much finance' might prolong the economic recoveries. Moreover, as the institutional characteristics might influence the relationship between financial development and growth, we also investigate whether higher institutional quality, higher regulatory quality in particular, might limit the potential negative consequences of 'too much finance' for the duration of economic recoveries. Finally, this study also distinguishes between the role of the size of banking and non-banking financial institutions (shadow banks) in influencing the duration of economic recoveries.[1] Such distinction could be increasingly important, as the underregulated shadow banking sector has grown substantially, particularly in the post-GFC era, driven in part by the tighter regulation of the banking sector (Cizel et al., 2019; Hodula et al., 2020; Irani et al., 2021).

This paper is the first to use duration analysis to assess the role of 'too much finance' in influencing the duration of economic recoveries. More specifically, this study relies on a set of 414 episodes of economic recoveries observed over the period 1989-2019 in 67 countries. We define the duration of economic recovery as the time it takes the economy to fully recover after a recession. While a few empirical papers have already investigated the determinants of economic recoveries, we differ from the earlier empirical literature in several aspects: (i) we use a larger set of economic recoveries, (ii) our sample includes a general set of economic recoveries from all types of crises that occurred within a longer time frame, whereas the earlier studies have used more specific samples of recoveries – such as the recoveries from the Great Depression in the 1930s (Eichengreen and Sachs, 1985), recoveries from the GFC (Tsangarides, 2012; Dao, 2017), or recoveries from banking/financial crises (Takats and Upper, 2013; Ambrosius, 2017); (iii) we focus specifically on the role of 'too much finance' – by conducting a deeper analysis into the role played by various aspects of financial development; this contrasts with earlier studies, which have explored a general list of determinants, such as the overall size of the financial sector or the overall level of financial development (Dao, 2017; Ambrosius, 2017; Fisera, 2022), but that have not investigated specifically the issue of 'too much finance'.

[1] Beck et al. (2014) have uncovered empirical evidence that while economic growth is positively affected by increasing financial intermediation, the growth of other parts of the financial sector has no effect on economic growth. As a result, Arcand et al. (2015) also underline the potential difference between the banking sector and shadow banking sector with regards to the issue of 'too much finance'.

Our empirical evidence indicates that 'too much finance' represents an issue for the duration of economic recoveries. Namely, we find that both a higher overall level of financial development, as well as financial development too high relative to the country's level of economic development prolong the duration of economic recoveries. That is, more financially developed economies seem to experience slower recoveries after a recession. These findings seem to be driven by the level of financial institutions development and not by the level of financial markets development. In particular, the size of non-bank financial institutions, or shadow banks, seems to be the main contributor to the negative effect of higher financial development on the duration of economic recoveries. However, we also show that a higher quality of the regulatory framework might limit the negative consequences of 'too much finance' on the length of economic recoveries. Our findings thus underline the risks posed by a too large financial system combined with an inefficient regulation to a robust and speedy economic recovery after a recession.

The rest of this paper is organized as follows. Section 2 provides a brief review of the relevant empirical literature on the determinants of economic recoveries. The econometric methodology is described in Section 3, while Section 4 presents the data. The empirical findings are discussed in Section 5. Finally, Section 6 concludes the paper.

2 Literature Review

The strand of literature that we follow most closely in this paper are the few empirical studies that investigate the determinants of the length or speed of economic recoveries. An early example of such analyses is Eichengreen and Sachs (1985), who study the determinants of economic recoveries from the Great Depression in the 1930s, and find that faster and stronger recoveries were associated with more significant currency devaluations. Mitchener and Wandschneider (2015) find that the imposition of capital controls did not accelerate the economic recoveries from the Great Depression. For a sample of economic recoveries around the GFC, Tsangarides (2012) shows that emerging economies with floating exchange rate regimes experienced faster economic recoveries when compared to pegged exchange rate regimes – with the trade channel explaining the superior performance of floats. Dao (2017) also studies the determinants of economic recovery from the GFC – using data for 21 developed and developing economies. Dao (2017)'s findings indicate that neither inflation, nor current balance influence the economic growth during the recovery period. However, financial system characteristics are found to play an important role in stimulating the economic recovery – as higher levels

of financial liberalization and financial depth increase the economic growth during the recovery period.

From a slightly different perspective, Takats and Upper (2013) use a sample of 39 economic recoveries that occurred after financial crises between 1970s and early 2000s, to identify the factors that increase the speed of economic recovery. They reach several interesting findings: (i) higher international competitiveness caused by real exchange rate depreciation significantly increases the speed of economic recovery. Conversely; (ii) deleveraging (i.e., declining bank credit to private sector) does not seem to influence the speed of economic recovery; and (iii) increasing public debt contributes to somewhat weaker recoveries. An exploratory study by Ambrosius (2017) also identified a large number of factors that influence the speed of recovery from banking crises. Using a sample of 138 banking crises that occurred over the period 1970-2012, Ambrosius (2017) finds that a large financial sector, overvalued domestic currency and large primary deficit contribute to a slower economic recovery. Moreover, international factors such as lower growth rate of world trade, higher uncertainty on international financial markets, and global interest rate shocks also contribute to longer recoveries. Interestingly, higher inflation and public debt do not seem to influence the speed of economic recovery.

Other studies have studied more general samples of economic recoveries from different types of crises. Here, Claessens et al. (2012) find that if the preceding recession was associated with a greater financial disruption, the economic growth during the year following the end of the recession was lower. Moreover, recoveries accompanied by house price and credit booms are linked with higher economic growth during the year following the recession. Using a large sample of economic recoveries from output gap recessions, Fisera (2022) finds that undervalued domestic currency cuts the length of economic recovery. However, higher financial development seems to eliminate the negative consequences of an overvalued currency. Using a large panel of countries, Cerra and Saxena (2008) studied whether economic contractions are followed by offsetting fast recoveries. They find that output losses associated with financial and political crises are highly persistent.

This paper aims at extending and contributing to the above mentioned literature by addressing the factors that determine the duration of economic recoveries, with a particular emphasis on the role of 'too much finance'. The empirical methodology – the duration analysis – which we employ in this study also allows us to characterise the time dynamics, or duration dependence, of those events. In fact, the distinction between *duration* and *occurrence* of economic recoveries is important for welfare reasons. For example, welfare losses can be relatively small if the recovery is faster, but high in case

it lasts longer. Therefore, as relevant as predicting the time of their occurrence, it is the dynamics of the duration of those events (and, hence, their severity) that might concern policymakers the most due to their potential welfare impact. Kiefer (1988) highlights the importance of this duration analysis very clearly: "*... the welfare of the unemployed is surely more closely related to the time they spend without a job than to the fact of their being unemployed. In this sense, the unemployment rate, which involves both the incidence (or occurrence) of unemployment spells and their durations, is a less useful statistic than is the average duration of unemployment.*" This reasoning justifies the need to analyse the duration of economic events and, consequently, the necessity to use proper methods or techniques in that analysis.

3 Empirical Methodology

Duration analysis started to be developed and implemented in engineering and medical research, but its use quickly spread to other sciences. In economics, this kind of analysis was initially applied to study the duration of unemployment periods.[2] However, due to its properties, duration analysis has been widely used in other areas of economics.[3] In particular, it has become a very popular methodology to study the duration of business cycle phases.[4] In this paper, we take advantage of those properties and parsimoniousness to extend its application to the analysis of the duration of economic recoveries.

Two basic functions to be considered in duration analysis are the hazard function ($h(t)$) and the survivor function ($S(t) = exp\{-\int_0^t h(u)du\}$). The hazard function measures the rate at which economic recoveries end at each moment t, given that they last at least until that moment, i.e., $h(t) = P(T = t|T \geq t)$, where T is a random variable that indicates the time at which the event occurs. The survivor function measures the probability of their duration being greater than or equal to t, i.e., $S(t) = P(T \geq t)$.

The hazard function is useful to characterize the duration dependence path. If

[2]See Allison (1982, 2014) and Kiefer (1983, 1988) for a review of the literature on duration analysis. For seminal applications to the study of unemployment length see Kiefer (1984, 1988).

[3]Among other applications, it has been used to analyze the duration of stock markets' bull and bear cycles (Lunde and Timmermann, 2004), duration of expansions and recessions (Sichel, 1991; Zuehlke, 2003; Daviq, 2007; Castro, 2010, 2013), local government tenure in office (Castro and Martins, 2013), house price upturns and downturns (Bracke, 2013), length of fiscal consolidation programs (Agnello et al., 2013), booms and busts in the housing market (Agnello et al., 2015, 2017), periods of financial markets' shutdown and re-access (Agnello et al., 2018), sovereign ratings cycle phases (Agnello et al., 2021), duration of credit booms (Castro and Martins, 2013), length of economic downturns (Koutsoumanis and Castro, 2022), and duration of financial crises (Nguyen et al., 2022b).

[4]See, for example, Diebold and Rudebusch (1990), Diebold et al. (1990, 1993), Sichel (1991), Abderrezak (1998), Zuehlke (2003), Daviq (2007), Castro (2010, 2013), Bondt and Vermeulen (2021), and Koutsoumanis and Castro (2022), among others.

$dh(t)/dt > 0$ in moment $t = t^*$, then there is positive duration dependence in t^*, which means that the probability of a recovery ending at moment t, given that it has lasted until t, increases with t; an opposite conclusion is reached if the derivative is negative. There will be no duration dependence if the derivative is equal to zero.

The hazard function can be estimated by parametric methods. A functional form that is usually employed to parameterize the hazard function is the proportional hazards model:[5]

$$h(t, x) = h_0(t)e^{x\beta} \tag{1}$$

where $h_0(t)$ is the baseline hazard function that captures the dependency of the data to the duration dynamics, β is a kx1 vector of parameters to be estimated and x is a vector of time-invariant covariates. The baseline hazard is often characterized by a Weibull distribution:[6]

$$h_0(t) = \gamma p t^{p-1} \tag{2}$$

where $\gamma > 0$ is a constant term and $p > 0$ is the duration dependence parameter. If $p > 1$, there is positive duration dependence, which means that the conditional probability of economic recovery ending increases as the event gets older; if $p < 1$, there is negative duration dependence and the effect is the opposite; if $p = 1$, there is no duration dependence. Hence, by estimating p, we can test for duration dependence in the duration of economic recoveries.

From the hazard function, we derive the integrated hazard function, $H(t) = \int_0^t h(u)du = \gamma t^p$, and compute the survivor function, $S(t) = exp[-H(t)]$. Given the functional form described by equations 1 and 2, $S(t, x) = exp[-\gamma t^p e^{x\beta}]$. This model is estimated by Maximum Likelihood and the corresponding log-likelihood function for a sample of $i = 1, ..., n$ spells can be written as follows:

[5] This means that the ratio of the hazard rates for any two observations is constant over time.

[6] Other distributions could be considered (see Jenkins (2005)), like Exponential, Gompertz, Log-normal, Log-logistic, Generalized Gamma or even assume no parametric specification to the baseline hazard (Cox model). The suitability of the Weibull distribution was confirmed by the Akaike and Bayesian information criteria (AIC and BIC). The Weibull was always the one that simultaneously minimises the AIC and BIC and that maximises the log-likelihood function in the empirical estimations. We also tested the validity of the Weibull specification by regressing the log of the cumulative hazard on the log duration. The results do not reject the hypothesis of a 45-degree straight line, that is, they confirm the suitability of the Weibull specification to the data. All these results are not reported here to make the analysis parsimonious, but they are available from the authors upon request.

$$ln\ L(\cdot) = \sum_{i=1}^{n}[c_i ln\ h(t_i, x_i) + ln\ S(t_i, x_i)] = \sum_{i=1}^{n}[c_i(ln\ \gamma + ln\ p + (p-1)ln\ t_i + x_i\beta) - \gamma\ t_i^p e^{x_i\beta}] \tag{3}$$

where c_i indicates when observations are censored.[7]

4 Data

Our sample consists of 414 episodes/events of economic recoveries gathered from a sample of 67 countries[8] over the period 1989-2019. We identify these economic recovery periods based on the 'growth cycle' approach of Grigoli and Hakura (2010) as implemented in Fisera (2022).[9] For each economic recovery episode, we identify its length/duration. The duration of economic recovery is calculated as the number of quarters starting from the first quarter following the upturn/through (i.e., the deepest point of the recession that preceded the recovery) until the quarter when the output gap turns positive (i.e., the economy fully recovers).

In this study, we not only test for the presence of duration dependence in economic recovery events, but also control for some (time-invariant) factors that might influence their duration.[10]

We explore the effect of various control variables on the duration of economic recoveries. In particular, we control for the characteristics of the recession that preceded the economic recovery, for country-level macroeconomic characteristics, for financial system characteristics, as well as for institutional characteristics and for economic policies. These potential determinants are primarily chosen based on the earlier empirical literature, which studied the determinants of economic recoveries (Ambrosius, 2017; Fisera, 2022; Takats and Upper, 2013; Tsangarides, 2012).

[7] They are censored ($c_i = 0$) if the sample period under analysis ends before the end of the recovery; when an economic recovery ends in the observed sample period they are not censored (i.e., $c_i = 1$).

[8] The list of countries is provided in Table A1 in the Appendix.

[9] Economic recovery is defined as the period that follows a downturn, which is identified as an output gap recession for which the negative output gap was at least -0.5 % of potential output. Economic recovery period starts one quarter after the upturn/through and ends once the output gap turns positive. Output gap is calculated using the Hodrick-Prescott filter to obtain the cyclical component of real GDP time series for each of the countries in our sample. The data on real GDP, i.e., GDP at constant prices in the domestic currency, were obtained from the International Monetary Fund's database.

[10] Given that we are using a continuous-time duration model, it is not suitable to include time-varying control variables in the model. Therefore, we focus our analysis on available time-invariant factors. The values of all the control variables are set at the through (i.e., quarter before the start of the recovery period) to address endogeneity problems. Relying on those values is an adequate approach to assess how the initial economic conditions influence the duration of the subsequent economic recovery.

The primary factor of interest in our analysis is the level of financial development (*FinDev*). To account for its effect on the duration of economic recoveries, we rely on the financial development index developed by (Svirydzenka, 2016). To fine-tune our analysis, two sub-indices of financial development are also considered: the index of financial institutions development (*FinInstDev*) and the index of financial markets development (*FinMktDev*). To further explore the role played by different types of financial institutions, we also consider the size of banking institutions (*Bank*) and the size of non-bank financial institutions, to which we also refer as shadow banks (*NonBank*).[11]

We also extend the current empirical literature by focusing on the role of a set of institutional variables in influencing the duration of economic recoveries. However, our selection of institutional characteristics is constrained by the limited number of observations for some of the commonly-used institutional characteristics (i.e., Rule of Law) – due to their relatively short time series. As a result, our set of control variables includes: the Central Bank Independence index of Garriga (2016) (*CBIndep*), the Regulatory Quality index of the World Bank (*RegQuality*), as well as the level of economic freedom (*EconFreedom*) and property rights (*PropertyRights*) from the Heritage Foundation. Given that the quality of institutions had been found to be an important driver of long-term economic growth, we also investigate whether this holds true for cutting the duration of an economic recovery.

Next, we also control for exchange rate developments. While the exchange rates have significant macroeconomic consequences, we do not consider the exchange rate to be a purely macroeconomic control variable – as the exchange rate can be influenced by the policymakers, they might use it as a tool to cut the duration of an economic recovery. We use three alternative measures of exchange rate: nominal effective exchange rate (*NEER*), real effective exchange rate (*REER*), and real currency misalignment (*CM*). *NEER* (*REER*) is defined as annual percentage change of the nominal (real) effective exchange rate at through (i.e., quarter before the start of the economic recovery). The nominal and real effective exchange rates data are taken from the International Monetary Fund (IMF)'s International Financial Statistics database. For the real currency misalignment measure, we use the real currency misalignment from the EQCHANGE database, which is compiled by the Centre d'Etudes Prospectives et d'informations Inter-

[11] Our definition of shadow banking is in line with an older definition of the Financial Stability Board (FSB), which defined shadow banking as 'credit intermediation involving entities and activities outside the regular banking system' (FSB, 2011). We are aware that such a definition might be too broad for a policy analysis (Claessens et al., 2012). However, we opt for this approach, as it enables us to maximize our sample size. Namely, for many of the emerging economies in our sample, the data on proxies that were used to capture the size of the shadow banking sector in more recent studies are not available.

nationales (CEPII) based on Couharde et al. (2017). The exchange rate might influence the duration of economic recoveries in both directions: (i) via the 'trade channel', weaker (undervalued) domestic currency might stimulate the international competitiveness, exports and thus cut the duration of an economic recovery, (ii) via the 'financial channel', weaker (undervalued) domestic currency increases the value of external debt and external debt service and might thus lead to expenditure-switching and prolong the duration of economic recoveries. Consequently, depending on which of these channels is stronger, the exchange rate might have either a positive or a negative effect on real economy (Georgiadis et al., 2021).

In addition, we consider a set of control variables to account both for the characteristics of the recession that preceded the economic recovery and for country-level macroeconomic characteristics. The characteristics of the recession include: (i) the duration of the previous recession (*DurRecession*), measured by the number of quarters during which the output gap was negative; and (ii) the magnitude of the recession (*MagRecession*), measured as the percentage value of the negative output gap at through. We anticipate that both might prolong the duration of the subsequent economic recovery.

The set of macroeconomic factors includes: (i) gross fixed capital formation at through (*GFCF*); as investment is considered to be one of the most important determinants of economic growth, countries with a higher level of investment might recover faster; (ii) government debt at through (*GovDebt*), to control for the fiscal policy, more precisely for its room to maneuver, as highly indebted countries are likely to have limited options for fiscal expansion that might stimulate the economic recovery; (iii) annual rate of inflation at through (*Inflation*), to allow for potential inflationary pressures that might be triggered by the depreciation of the domestic currency during the recession.

We also add several measures of fiscal and monetary policies to control for their effect on the duration of economic recoveries. These include a dummy variable for sovereign debt restructuring episodes (*SovRestruct*), a fiscal impulse indicator (*FiscalImpulse*), government primary net lending (*GovNetLending*), real monetary conditions index (*RMCI*), and central bank interest rate (*CBRate*).

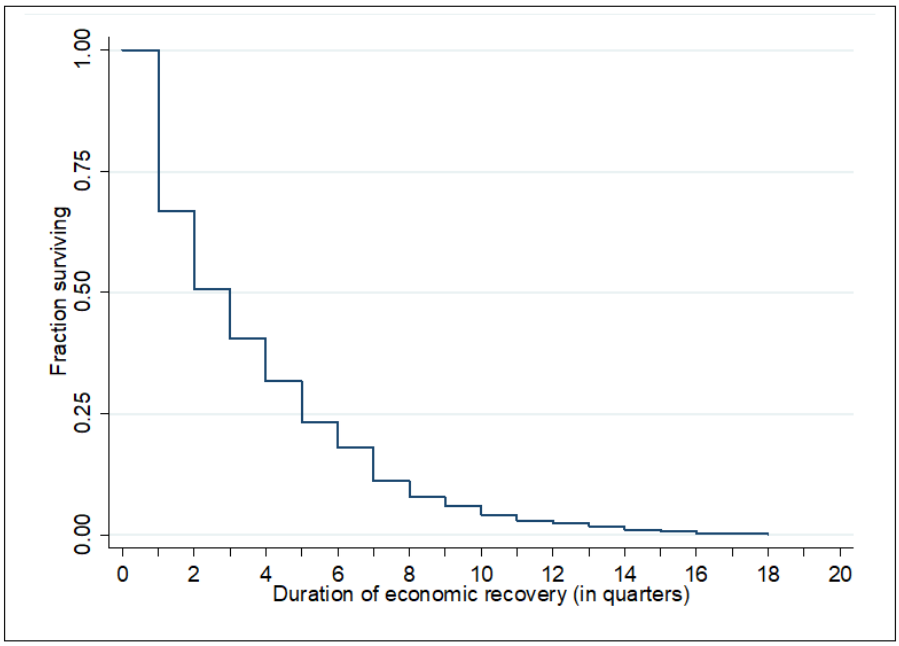
In addition, we also include a dummy that takes the value of 1 for advanced economies (*Advanced*), and 0 otherwise, to account for any potential heterogeneity between advanced and emerging economies. The potential time-effects are controlled for by using decade dummies (*D2000s* and *D2010s*).[12] Table A2 in the Appendix presents a

[12]These dummies take the value of 1 in the respective decades (2000s or 2010s) and 0 otherwise. The 1990s are used as base category. Yearly dummies do not render well with the structure of our data; there are many years for which we do not observe recovery events; even when we do, the number of events

detailed description of all the variables employed in this study, as well the sources of the data. The corresponding descriptive statistics are reported in Table A3 in the Appendix.

We observe that, on average, the economic recoveries identified in our sample tend to last slightly less than one year (3.7 quarters), ranging from a minimum of one quarter to a maximum of 18 quarters. The analysis of the respective survivor function in Figure 1 allows us to identify some interesting features. This function measures the probability of an economic recovery surviving after a certain duration or, in other words, the proportion of economic recoveries surviving over time. Figure 1 shows a substantial decrease in the probability of economic recoveries surviving as they become older. As this probability decreases quite rapidly, we conjecture that positive duration dependence might be present in these events. However, to formally test for its presence, we must test whether the parameter p in the Weibull model is significantly higher than 1, and if so whether it is decreasing, constant or increasing over time. We report the results of this test in section 5.

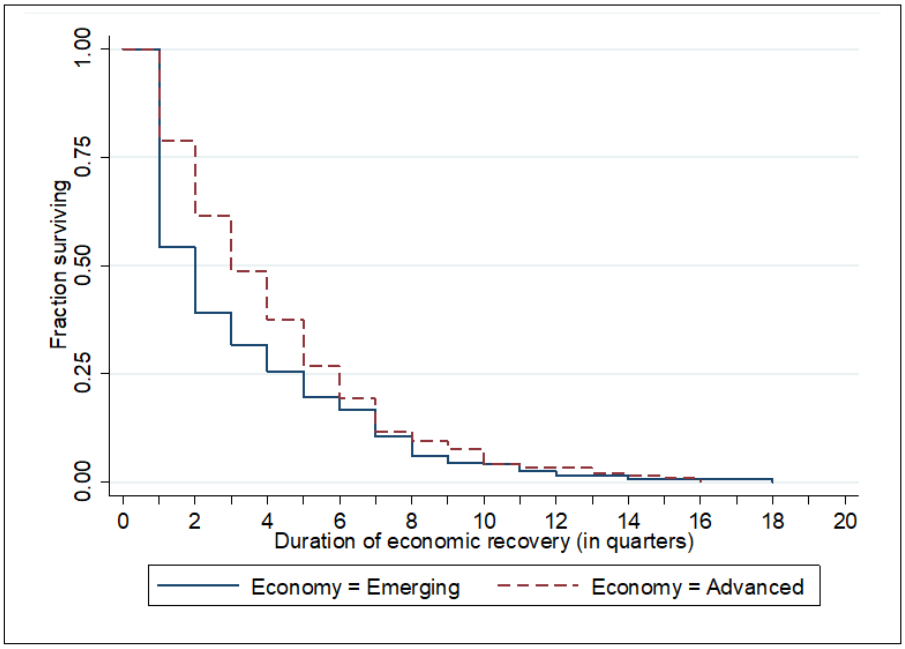
Figure 1: Survivor Function for the Entire Sample



Additionally, we can also test whether the likelihood of economic recoveries ending varies between advanced and emerging economies. A first look at the respective survivor functions reported in Figure 2 seems to indicate no significant difference – and a simple

per year is small. Therefore, to avoid the lack of variability in the data, we rely on decade dummies to account for the time effects.

Figure 2: Survivor Functions: Advanced versus Emerging economies



Note: Test-statistic for the log-rank test for equality of the survivor functions: chi2(1) = 2.84; Pr>chi2 = 0.092.

log-rank test for the equality of the survivor functions does not reject this hypothesis at a 5 % significance level. However, for a better assessment of this additional issue, we need to rely on the estimation of the parametric Weibull model – the results of which we report and discuss in the following section.

5 Results

The main findings from the estimation of the Weibull model are presented and discussed in this section. We start by outlining the main findings of our empirical analysis before delving into a sensitivity analysis and a set of robustness checks.

5.1 Main Results

We start by presenting and analysing the main results from the estimation of the continuous-time Weibull model for the duration of economic recoveries. The results are reported in Table 1. For each regression, we provide the estimated coefficients (and corresponding robust standard errors), the number of observations or spells of economic

recoveries, the Log-Likelihood function ($LogL$), the Schwarz Bayesian Information Criterion ($SBIC$), and the Likelihood Ratio Index (LRI).

The estimate of p measures the magnitude of the duration dependence and γ is the estimate for the constant term in the baseline hazard function. A one-sided test is used to detect the presence of duration dependence (i.e., whether $p > 1$ or $p < 1$ against the null of $p = 1$). Considering the basic model first (i.e., specification (1) in Table 1), the results provide strong evidence of positive duration dependence ($p > 1$).[13] Moreover, the analysis of the second derivative of the (baseline) hazard function shows that the hazard increases at a decreasing rate.[14] Hence, as economic recoveries become 'older' the probability of ending increases but at a decreasing rate. This indicates a relatively slow pace to their end.

In this first estimation, we assume that the population of individual spells is homogeneous, i.e., that each economic recovery is under the same risk of ending, and that no other factors/covariates affect the hazard function. However, this might not be the case. To test for this issue, we allow for the presence of unobserved heterogeneity or frailty, which represents an unobserved random proportionality factor that modifies the hazard function of an individual spell. Hence, this frailty factor is expected to account for heterogeneity caused by unmeasured (or omission of relevant) covariates or measurement errors.[15]

To include the frailty in the Weibull model, we modify the hazard function as suggested by Lancaster (1990), Gutierrez et al. (2001) and Castro (2013). This implies the estimation of an additional parameter θ, which will indicate the presence or absence of frailty. The respective results of this frailty model are reported in column (2) of Table 1 and the Likelihood Ratio (LR) test developed by Gutierrez et al. (2001) is used to detect its presence. The respective p-value indicates that θ is significantly higher than zero, which implies that frailty is present and an issue that needs to be addressed. Moreover, as expected in these cases, the magnitude of the duration parameter increases. This finding underlines the importance of including the variables introduced in the previous

[13] The sign + indicates significance at a 5 % level. A 1 % increase in the length of an economic recovery is associated with a 0.266 % (i.e., $p - 1$) increase in its hazard of ending, ceteris paribus. See Allison (2014) and note that, from the baseline hazard function, we get: $ln\, h(t) = \alpha + (p-1)\, ln\, t$.

[14] The second derivative of the (baseline) hazard function indicates whether – in the presence of positive duration dependence – the hazard function increases at a decreasing ($p < 2$), constant ($p = 2$) or increasing ($p > 2$) rate. Therefore, the presence of decreasing, constant or increasing positive duration dependence can be detected by testing if p is lower, equal or higher than 2. The symbols d, c, and i are used to indicate whether it is decreasing, constant or increasing, respectively. See Castro (2010) and Castro (2013) for further details.

[15] If this heterogeneity is ignored (and it is present in the data, in particular, because relevant covariates are omitted) the magnitude of positive duration dependence will be biased (underestimated).

section in the empirical analysis. This will not only address this issue, but also avoid the downward bias in the duration dependence parameter and allow us to have a complete picture of the factors that affect the dynamics of economic recoveries.

We start by considering a set of (naturally) time-invariant factors such as the length of the recession that preceded the recovery (*DurRecession*), a dummy to account for the eventual heterogeneity between advanced and emerging economies (*Advanced*), and decade dummies to control for the time effects (*D2000s* and *D2010s*). The results reported in column (3) of Table 1 indicate that economic recoveries tend to be longer, the longer the previous recession was. This finding indicates that longer recessions exhaust the economic agents – thus putting additional constraints on economic agents during the subsequent economic recovery, making it last longer. No significant difference is observed between advanced and emerging countries, which corroborates the evidence provided in the previous section.

In the next regression, we extend the model with our variable of interest: the index of financial development (*FinDev*). Moreover, as Fisera (2022) has shown that the relationship between the financial development and exchange rate might be an important determinant of economic recoveries, we also introduce our measure of exchange rate (*NEER*) as a control variable into the regression. The results reported in column (4) provide strong evidence that a higher level of financial development at through increases the duration of economic recoveries.[16] Therefore, this finding does indicate that 'too much finance' might indeed have harmful macroeconomic consequences and increase the duration of economic recoveries. We explore this finding in a greater detail in the following subsection. This result is in line with the results of Claessens et al. (2012), who find some evidence that higher financial development at through reduces the economic growth during the first year following the recession, as well as in line with the findings of Arcand et al. (2015), who find negative effect of 'too much finance' on economic growth.

We also find that an appreciation (depreciation) of nominal exchange rate at through leads to a higher (lower) likelihood of the economic recovery ending. This somewhat surprising finding seems to indicate that the 'financial channel' of the exchange rate dominates the 'trade channel' – that is, the negative effect of weaker domestic currency on external debt burden exceeds the positive effect of weaker domestic currency on international competitiveness and exports. This result can be explained by the fact

[16] In particular, a one percentage point rise in *FinDev* at through decreases the likelihood of an economic recovery ending by around 1.13 %. For details on this interpretation see Allison (2014). In particular, $100(\exp(\beta) - 1)$ gives the percentage change in the hazard for each unitary increase in the respective explanatory variable. Note that the coefficient on *FinDev* has to be divided first by 100 as the original Financial Development index is in a scale between 0 and 1.

Table 1: Duration of Economic Recoveries

	(1)	(2)	(3)	(4)	(5)	(6)
gamma	0.173***	0.154***	0.315***	0.440***	0.214**	0.310*
	(0.021)	(0.017)	0.071	(0.106)	(0.109)	(0.164)
p	1.266+,d	1.853+,c	1.308+,d	1.363+,d	1.395+,d	1.407+,d
	(0.043)	(0.290)	(0.043)	(0.047)	(0.059)	(0.058)
theta		0.818				
		(0.414)				
		[0.000]				
FinDev				-1.1337***	-1.1593**	-1.2030**
				(0.4267)	(0.4716)	(0.4785)
NEER				0.0133***	0.0151**	
				(0.0039)	(0.0061)	
NEER_appre						-0.0078
						(0.0063)
NEER_depre						-0.0359***
						(0.0102)
DurRecession			-0.1120***	-0.1074***	-0.1146***	-0.1193***
			(0.0234)	(0.0230)	(0.0289)	(0.0305)
MagRecession					0.0144	0.0124
					(0.0446)	(0.0435)
GFCF					0.0404***	0.0352***
					(0.0129)	(0.0128)
GovDebt					0.0004	0.0006
					(0.0021)	(0.0023)
Inflation					0.0112	0.0216***
					(0.0101)	(0.0083)
CBIndep					-0.7472**	-0.9285**
					(0.3787)	(0.3723)
Advanced			-0.2291	-0.0172	0.0848	0.0275
			(0.1440)	(0.1945)	(0.2209)	(0.2280)
D2000s			-0.2172	-0.1755	0.0239	0.0329
			(0.1684)	(0.1533)	(0.1921)	(0.1886)
D2010s			-0.1475	-0.1724	0.1848	0.1503
			(0.1903)	(0.1841)	(0.2284)	(0.2412)
Observations	414	414	411	369	323	323
LogL	-535.2	-527.6	-508.5	-444.5	-382.9	-378.4
SBIC	1082.4	1073.2	1053.2	936.2	841.0	837.7
LRI	.	.	0.041	0.062	0.077	0.087

Notes: See Table A2 in the Appendix for the description of all variables and sources. Robust standard errors (clustered by country) for the estimated coefficients are in parentheses. Significance level at which the null hypothesis is rejected: ***, 1 %; **, 5 %; and *, 10 %. The sign '+' indicates that the duration dependence parameter p is significantly higher than 1 using a 5 % one-sided test; d (c) indicates the presence of decreasing (constant) positive duration dependence at a 5 % level. The p-value for the likelihood-ratio test of theta=0 (frailty test) is provided in square brackets in column (2). 'Observations' correspond to the number of economic recovery spells. $SBIC = 2[-LogL + (k/2)LogN]$, where $LogL$ is the log-likelihood for the estimated model, k is the number of regressors and N is the number of observations. LRI is the likelihood ratio index or pseudo-R2, $LRI = 1 - LogL/LogL0$, where $L0$ is the likelihood of the model without regressors.

that while the effect of exchange rate operating via the 'financial channel' materializes immediately (i.e., the external debt burden increases immediately), it might take a while for the positive effect of weaker domestic currency on exports to materialize – as indicated by the J-curve. Consequently, the positive effect of weaker domestic currency, via the 'trade channel', might not materialize quickly enough to stimulate the economic recovery (i.e., it could materialize only once the economy had already recovered). Furthermore, there is some empirical evidence that the 'trade channel' of the exchange rates might be weakening with the increasing globalization of the world economy: Fisera and Horvath (2022) found that the growing participation in the Global Value Chains (GVCs) limits the positive effect of a weaker domestic currency via the 'trade channel'.

Our results remain robust when we extend the model with a set of additional control variables that are expected to affect the duration of economic recoveries (see column (5)). First, while the dynamics of economic recoveries are still characterized by the presence of (decreasing) positive duration dependence and the respective hazard significantly affected by *REER*, *FinDev* and *DurRecession*, no differences arise from *Advanced* or the time dummies. Second, the likelihood of a recovery ending is also affected by the level of investment (positively) and central bank independence (negatively). Hence, while higher gross fixed capital formation (*GFCF*) at through shortens the economic recoveries as expected, a more independent central bank (*CBIndep*) makes them longer. The finding for investments is in line with the expectations – as investments are generally expected to increase the stock of capital and thus increase output and economic growth (Solow, 1956). The finding for *CBIndep* is somewhat surprising. Even though central banks care about economic growth, their mandates are usually more substantially tied to controlling inflation. The more independent they are, the more likely they are to stick to this priority, which might delay the economic recovery. That is, the more independent central banks might be more inclined to raise interest rates to combat inflation pressures even if it comes at a cost of lower economic growth and slower recovery. In other words, more independent central banks are less likely to yield to the government pressure to stimulate the economic recovery even at a cost of higher inflation.

Finally, the magnitude of the previous recession (*MagRecession*), Government debt (*GovDebt*) and the inflation rate (*Inflation*) have not proved to affect the duration of economic recoveries. The insignificant finding for *GovDebt* is in line with the empirical evidence provided by Eberhardt and Presbitero (2015), who found that the relationship between the public debt exists over the long-term. Hence, for a rather short-term event as the economic recovery, the *level* of government debt might not be an important driver

of its duration.[17]

Next, as Nouira and Sekkat (2012) have shown that there exist significant non-linearities between the effect of exchange rate overvaluation (appreciation) and undervaluation (depreciation), we split our exchange rate measure into two separate measures of exchange rate appreciation (*NEER_appre*) and depreciation (*NEER_depre*). These variables take the value of *NEER* if the exchange rate appreciates or depreciates, respectively, and 0 otherwise.[18] We report the results in column (6) of Table 1. We observe that in line with our expectations, the exchange rate effect is driven mainly by depreciations and not by appreciations. Our results indicate that a higher depreciation pace (i.e., a higher *NEER_depre*), right before the recovery starts, increases the duration of economic recoveries (while smaller depreciations might make the recoveries shorter). This finding suggests that larger depreciations contribute to a much sharper increase in external debt burden, which then increases the duration of the subsequent recovery – i.e., the 'financial channel' dominates the 'trade channel'. All the other results remain qualitatively unchanged, with the exception of inflation, which in this setting seems to contribute to make economic recoveries shorter. This could be explained by some correlation between *NEER_depre* and *Inflation*. However, this correlation does not influence our findings for *NEER_depre*, as the coefficient of *NEER_depre* remains unchanged even once we remove *Inflation* from the regression.

5.2 Too Much Finance?

Given that our main results robustly indicate that a higher level of financial development increases the duration of economic recoveries, in this subsection, we explore further whether this finding could be driven by the issue of 'too much finance'. First, financial development is known to be highly endogenous to economic development. Therefore, an argument can be made that our results in the baseline regressions are not driven by 'too much finance' but by advanced economies, which experience slower recoveries and have a higher level of financial development. To address this concern, we follow the approach of Fisera (2022) and regress the financial development index on GDP (PPP) per capita (and time effects) in a panel setting. We then take the residuals (*FinDevRes*) from this regression and use them as a simple measure of 'too much finance'. That is, the higher

[17] Moreover, Eberhardt and Presbitero (2015) also show that there is no common debt threshold within countries, from which the *level* of government debt exerts a negative effect on economic growth. Consequently, similar levels of government debt might have different consequences for economic growth (and thus for the duration of economic recoveries) across different countries.

[18] To ease interpretation, we take the absolute values of *NEER_depre* – that is, the values of *NEER_depre* are positive and higher values indicate a greater magnitude of depreciation.

the value of *FinDevRes*, the higher the financial development – compared to its expected average level, given the country's level of economic development. Next, we replace our main measure of financial development (*FinDev*) with *FinDevRes* and reestimate our baseline regression. We report the results in column (1) of Table 2. Our findings indicate that the negative coefficient on *FinDevRes* is significantly larger than the coefficient on *FinDev* in our baseline regression. This finding does seem to indicate that our baseline results are indeed driven by the issue of 'too much finance': when a country has a higher level of financial development than its level of economic development would warrant for, its economic recovery tends to be longer.

Next, we also split our sample into advanced and emerging economies to investigate, whether our results are driven by the advanced economies. We report the results in columns (2) and (3) of Table 2. Interestingly, we find that higher financial development (*FinDevRes*) increases the duration of economic recoveries in both advanced and emerging economies. However, the effect seems to be much more pronounced in emerging economies than in advanced economies.[19] This finding seems to be in line with a hypothesis put forward by Arcand et al. (2015), according to which, the issue of 'too much finance' could be exacerbated by low regulatory quality. Consequently, a too large financial system, which operates within a poor regulatory framework, could have more negative macroeconomic consequences – and might therefore prolong the duration of economic recovery. Given that emerging economies generally have poorer regulatory frameworks, the more negative effect of too high financial development in the emerging economies could be explained by their inefficient financial system regulation. We explore this hypothesis further in the following subsection.

In the next set of estimations, we look in greater detail at the role of various dimensions of financial development. In particular, we rely on two sub-indices of the financial development index – the index of financial institutions development (*FinInstDev*) and the index of financial markets development (*FinMktDev*). The results are reported in columns (4-5) in Table 2 and show that their effect remains negative, but the magnitude of the coefficient on financial institutions development (*FinInstDev*) is almost double the coefficient on financial markets development (*FinMktDev*). Moreover, the level of significance is also higher for the former than the latter. This means that our baseline results seem to be driven more significantly by the development of financial institutions than by the financial markets development – i.e., the more developed the

[19] For our baseline measure of financial development, *FinDev*, we find a negative and statistically significant coefficient for emerging economies, and negative and insignificant coefficient for advanced economies – please see subsection 5.4.

Table 2: Financial Development and Duration of Economic Recoveries

	(1)	(2)	(3)	(4)	(5)
gamma	0.200***	0.093***	0.101***	0.328*	0.217**
	(0.086)	(0.063)	(0.061)	(0.193)	(0.104)
p	1.345+,d	1.466+,d	1.341+,d	1.405+,d	1.395+,d
	(0.043)	(0.053)	(0.061)	(0.058)	(0.060)
FinDevRes	-1.6846**	-1.5638**	-3.5152***		
	(0.6755)	(0.7413)	(1.0651)		
FinInstDev				-1.1959**	
				(0.6114)	
FinMktDev					-0.6061*
					(0.3221)
NEER_appre	-0.0064	-0.0001	-0.0028	-0.0053	-0.0069
	(0.0068)	(0.0276)	(0.0074)	(0.0064)	(0.0063)
NEER_depre	-0.0346***	-0.0018	-0.0371***	-0.0372***	-0.0360***
	(0.0102)	(0.0149)	(0.0141)	(0.0104)	(0.0103)
DurRecession	-0.1126***	-0.0600**	-0.1467***	-0.1164***	-0.1185***
	(0.0304)	(0.0294)	(0.0566)	(0.0312)	(0.0305)
MagRecession	0.0107	0.1388***	-0.0574	0.0070	0.0044
	(0.0466)	(0.0469)	(0.0412)	(0.0430)	(0.0421)
GFCF	0.0356***	0.0511**	0.0478***	0.0308**	0.0377***
	(0.0132)	(0.0220)	(0.0138)	(0.0136)	(0.0121)
GovDebt	0.0014	-0.0016	0.0101*	0.0005	0.0005
	(0.0023)	(0.0023)	(0.0061)	(0.0021)	(0.0022)
Inflation	0.0212**	0.0124	0.0150	0.0208***	0.0229***
	(0.0084)	(0.0566)	(0.0100)	(0.0078)	(0.0084)
CBIndep	-1.0586***	-0.7809**	-1.5235**	-0.8780**	-0.8614**
	(0.3768)	(0.3977)	(0.7303)	(0.3517)	(0.3819)
Advanced	-0.1760			0.1355	-0.1298
	(0.1989)			(0.2735)	(0.2025)
D2000s	-0.0151	-0.1298	0.3022	-0.0364	0.0082
	(0.1904)	(0.2163)	(0.3429)	(0.1801)	(0.1899)
D2010s	0.0629	0.1985	0.1545	0.1429	0.1149
	(0.2497)	(0.2864)	(0.4279)	(0.2396)	(0.2426)
Observations	323	177	146	323	323
LogL	-377.2	-188.9	-170.2	-379.3	-380.7
SBIC	835.3	445.0	405.2	839.5	842.3
LRI	0.090	0.089	0.158	0.085	0.082

Notes: See Table 1. *FinDevRes* is our simple measure of 'too much finance', which was calculated as the residuals from the regression of *FinDev* on GDP (PPP) per capita. Regressions (2) and (3) are separate regressions for advanced and emerging countries, respectively.

financial institutions are, the longer the economic recovery will be. We argue that this result is in line with our arguments on the adverse role of 'too much finance'. Namely, once the financial institutions become too developed and large, and the financial system too complex, the financial institutions also become more vulnerable, as they are more likely to extend credit to fund unproductive and risky investments. Consequently, once the economy enters recession, the subsequent deleveraging by the financial institutions might prolong the economic recovery. This finding is in line with the results of Langfield and Pagano (2015), who find that the growth of the banking system relative to stock and bond markets is associated with lower economic growth and higher systemic risk.

To further explore the role of financial institutions and the regulatory frameworks, we conduct additional empirical exercise. Namely, the growth of non-bank financial institutions (i.e., shadow banking) had been blamed for contributing to the outburst of the Global Financial Crisis of 2008-2009 (GFC) (Poszar et al., 2013). Shadow banks had been described as less resilient than traditional banks due to their higher interconnectedness, significant leverage, less stable funding base and more significant liquidity and maturity mismatches (Poszar et al., 2013). Additionally, non-bank financial institutions are generally less regulated than banking financial institutions. Consequently, a large shadow banking sector might be more likely to contribute to the issue of 'too much finance' – and, via its higher volatility, as well as via the provision of funding for more risky and less productive projects, might prolong the duration of economic recoveries.

Therefore, in the next robustness check, we focus specifically on the role of banking and non-banking financial institutions – instead of the role of the overall level of financial development. To this end, we introduce a specific measure for the banking financial institutions (*Bank*) and non-banking financial institutions (*Shadow*) in our regressions. These measures capture the size of these financial institutions compared to the size of the economy. We report our results in Table A4 in the Appendix. However, we treat these findings with some caution because shadow banking still remains largely understudied – and we use a broad measure of shadow banking. Moreover, the data on non-bank financial institutions are available for only a limited sample of countries. As a result, the number of observations in our sample drops to a mere 100. To address the concerns that our results are driven by different sample composition, in column (1) of Table A4 in the Appendix, we first run our baseline regression with our baseline measure of financial development (*FinDev*) on this smaller sample. The results for the *FinDev* are in line with our main findings.

Next, we explore the role of banking and non-banking financial institutions. Interestingly, our findings indicate that the size of the deposit banks does not seem to

influence the duration of economic recoveries. However, we find evidence that a large shadow banking sector seems to increase the duration of economic recoveries – as indicated by the negative and statistically significant coefficient of the variable *Shadow* in Table A4 in the Appendix (columns 3-4). Moreover, we also express our measure of shadow banking as a ratio to the overall size of both banking and non-banking financial institutions (*ShadowShare*) and introduce this measure in our regressions (column 5). Once again, we find that the higher the share of the shadow banking in the overall financial system, the longer the duration of economic recoveries. We conclude that these results provide tentative evidence that the (largely) unregulated shadow banking sector seems to significantly contribute to the issue of 'too much finance' – a situation when a too large financial system is inefficient and volatile – leading to a longer recovery after a recession.

For this analysis, both of our measures (*Bank* and *Shadow*) are expressed at their values at through – as is the case for all our explanatory variables. However, while the variable *FinDev* is relatively stable over time and backward-looking, the size of banking (*Bank*) and non-banking (*Shadow*) financial institutions is more volatile and highly pro-cyclical. Therefore, taking their values at through (i.e., at the deepest point of the recession), might not fully capture their effect on the duration of economic recovery. To address this particular concern, we express both *Bank* and *Shadow* as the three-year average before the economic recovery and we re-run all the regressions with these alternative measures. We report the results in columns (6-9) of Table A4 in the Appendix. These results are fully in line with the ones obtained for *Bank* and *Shadow*.

5.3 Sensitivity Analysis: Institutional and Other Control Variables

To assess the sensitivity of our results, we extend the baseline model with some institutional and policy factors, which could also influence the duration of economic recoveries. As the number of observations is reduced with the inclusion of those variables, the results should be interpreted with some care. Nevertheless, the inclusion of those additional variables does not affect the main conclusions of this study.

We start by controlling for the role played by regulatory quality (*RegQuality*). We report the results in column (1) of Table 3. However, higher regulatory quality does not seem to influence the duration of economic recovery. Nonetheless, based on the arguments in Arcand et al. (2015), we hypothesize that higher regulatory quality might limit the negative consequences of too high financial development. To explore this hypothesis,

in the next step, we interact *RegQuality*[20] with *FinDev* and include this interaction in the model. We report the results in column (2) of Table 3. Interestingly, we find that the coefficient on the interaction term is positive and highly statistically significant – while the coefficient of *FinDev* turns much more negative. This finding indicates that the higher level of regulatory quality limits the negative effect of a higher financial development on the duration of economic recoveries. Based on this result, we conjecture that a better regulatory framework might, for instance by limiting overlending by financial institutions, minimize the negative consequences of a highly developed financial system for the economic recovery. However, we reiterate that since the number of observations is smaller, some caution is required when interpreting this result.

Next we assess the role of economic freedom (*EconFreedom*) and property rights (*PropertyRights*) in influencing the duration of economic recoveries. We are led to believe that higher economic freedom and better protection of property rights can boost economic performance (Doucouliagos and Ulubasoglu, 2006; Alquist et al., 2022) – as freer economic agents, whose property is well protected, might be more entrepreneurial and innovative – contributing to higher productivity and growth. Therefore, we explore, whether higher economic freedom and better protection of property rights might make the recovery shorter. That is precisely the effect we observe in the results, but an insignificant one. The results are reported in columns (3) and (4) of Table 3. It seems that while higher economic freedom (better property protection) might boost long-term growth, it does not have a positive short-term effect and does not seem to influence the duration of economic freedom.

Recessions that precede economic recoveries might be associated with sovereign debt crises. A sovereign debt crisis might require sovereign debt restructuring, which might influence the duration of the subsequent recovery. Consequently, we also introduce a dummy to control for sovereign debt restructuring (*SovRestruct*) that occurred within a year before the start of the recovery. Our results indicate that the respective coefficient on *SovRestruct* is not significant and the inclusion of *SovRestruct* does not influence our findings regarding financial development.

Expansionary fiscal and monetary policy might be used to stimulate output growth and thus cut the duration of an economic recovery. Therefore, in the next set of regressions, we also account for the impact of fiscal and monetary policies on the duration of economic recoveries. First, we use the fiscal impulse (*FiscalImpulse*) and

[20]We are aware that *RegQuality* only captures the overall regulatory quality and not specifically the quality of the financial sector regulation. But in the absence of data on the quality of financial regulation, we argue that *RegQuality* is a suitable proxy, as countries with higher overall regulatory quality are also more likely to exhibit a higher quality of financial regulation.

real monetary conditions index (*RMCI*) to account for fiscal and monetary policy, respectively. While an expansionary fiscal impulse at the through makes the subsequent recovery faster, easier monetary conditions have no relevant effect. In column (7) of Table 3, we use another proxy for the role of monetary policy: the central bank interest rate (*CBRate*). This seems to be a better proxy, as its coefficient comes significant, indicating that a lower interest rate hastens the process of economic recovery. Our findings remain valid even when we replace the fiscal impulse variable with the government net lending (*GovNetLending*) – which also corroborates the important role of the fiscal policy. Alloza (2022) also found that fiscal policy has a positive effect on economic activity during expansions, and a negative effect during recessions. Thus, our findings do indicate that expansionary fiscal and monetary policies can stimulate the economic recovery. However, these results should be taken with a grain of salt as the number of observations is substantially reduced when these control variables are used. Importantly, even once we control for fiscal and monetary policies, our main finding for the effect of financial development remains unchanged.

Next, we use alternative measures of exchange rate – the real effective exchange rate (*REER*) and the real currency misalignment (*CM*). While for studying the drivers of economic recoveries, the nominal exchange rate (*NEER*) could be argued to represent an appropriate control variable, the *NEER* would be expected to have an effect on economic performance via the 'trade channel' only if the change in nominal exchange rate also affects the real exchange rate – that is, for instance, nominal depreciation is not compensated by higher domestic inflation.[21] As a result, we use the two alternative exchange rate measures to assess whether our baseline results hold. We report the results in Table A5 in the Appendix. Firstly, the results show that the choice of the exchange rate measure does not influence the coefficient of *FinDev* – our main variable of interest. Second, the results for *REER* are very similar to our results for *NEER*, presumably owing to sticky prices over the short-term. Thus, using *REER* also does not seem to provide supportive evidence for the 'trade channel' of the exchange rates.

In addition, we use the real currency misalignment (*CM*) as an alternative measure of exchange rate. Nevertheless, neither the overall measure of currency misalignment (*CM*), nor the separate measures for overvaluations and undervaluations seem to have any discernible effect on the duration of economic recovery. We interpret this result as further indication that the exchange rate influences the economic recovery primarily via

[21] For economic recovery, which is a relatively short-term affair, owing to sticky prices, changes in nominal exchange rate could be expected to be reflected in real exchange rate changes – explaining our choice of *NEER* as our baseline measure of exchange rate.

Table 3: Additional Institutional and Policy Factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
gamma	0.341	0.463	0.135	0.209*	0.227**	0.460*	0.197	0.145
	(0.250)	(0.341)	(0.106)	(0.119)	(0.115)	(0.271)	(0.126)	(0.096)
p	1.370+,d	1.390+,d	1.376+,d	1.377+,d	1.396+,d	1.470+,d	1.511+,d	1.523+,d
	(0.054)	(0.050)	(0.064)	(0.063)	(0.058)	(0.062)	(0.071)	(0.072)
FinDev	-1.4827**	-3.1058***	-1.2702**	-1.4966**	-1.1914**	-1.0813**	-1.4189***	-1.6636***
	(0.6681)	(0.8445)	(0.5078)	(0.6174)	(0.4706)	(0.4944)	(0.5242)	(0.5377)
*FinDev*RegQuality*		1.6603***						
		(0.5513)						
NEER	-0.0023	0.0011	0.0209**	0.0212**	0.0157***	0.0125*	0.0079	0.0049
	(0.0097)	(0.0095)	(0.0099)	(0.0101)	(0.0059)	(0.0073)	(0.0088)	(0.0092)
DurRecession	-0.0956***	-0.0974***	-0.1006***	-0.1008***	-0.1136***	-0.1201***	-0.1145***	-0.1039***
	(0.0333)	(0.0349)	(0.0318)	(0.0318)	(0.0285)	(0.0301)	(0.0338)	(0.0347)
MagRecession	0.0213	0.0169	0.0104	0.0105	0.0161	-0.0004	0.0613*	0.0583*
	(0.0607)	(0.0529)	(0.0483)	(0.0474)	(0.0429)	(0.0471)	(0.0338)	(0.0345)
GFCF	0.0441***	0.0524***	0.0326**	0.0315**	0.0384***	0.0347**	0.0590***	0.0622***
	(0.0155)	(0.0152)	(0.0136)	(0.0137)	(0.0134)	(0.0139)	(0.0159)	(0.0162)
GovDebt	0.0003	0.0015	0.0009	0.0005	0.0005	-0.0017	-0.0039	-0.0019
	(0.0035)	(0.0030)	(0.0026)	(0.0028)	(0.0021)	(0.0027)	(0.0030)	(0.0031)
Inflation	-0.0123	-0.0144	0.0141	0.0126	0.0133	-0.0116	-0.0568*	-0.0598**
	(0.0100)	(0.0111)	(0.0113)	(0.0110)	(0.0085)	(0.0087)	(0.0292)	(0.0293)
CBIndep	-1.2967***	-1.2503***	-0.8726**	-0.8592**	-0.7682**	-1.1478***	-0.9675***	-0.8473**
	(0.3983)	(0.4124)	(0.4018)	(0.4234)	(0.3756)	(0.3649)	(0.3608)	(0.3611)
RegQuality	0.3274	-0.4213						
	(0.2218)	(0.3443)						
EconFreedom			0.0127					
			(0.0114)					
PropertyRights				0.0079				
				(0.0062)				
SovRestruct					-0.5449			
					(0.3677)			
FiscalImpulse						0.1209***	0.0955*	
						(0.0412)	(0.0520)	
RMCI						-0.0004		
						(0.0076)		
CBRate							-0.0540**	-0.0538**
							(0.0253)	(0.0254)
GovNetLending								0.0521*
								(0.0277)
Advanced	-0.1733	-0.2470	-0.0529	-0.1165	0.0892	-0.1621	0.2086	0.3259
	(0.2816)	(0.2804)	(0.2300)	(0.2651)	(0.2184)	(0.2191)	(0.2573)	(0.2609)
D2000s	-0.2442	-0.2514	-0.0373	0.0605	0.0198	-0.0927	0.0775	0.0890
	(0.1695)	(0.1631)	(0.2350)	(0.2430)	(0.1953)	(0.1871)	(0.2785)	(0.2842)
D2010s			0.1286	0.2353	0.1944	-0.0924	0.1065	0.2152
			(0.2633)	(0.2616)	(0.2289)	(0.2518)	(0.3307)	(0.3440)
Observations	213	213	286	286	323	291	230	232
LogL	-246.5	-241.1	-341.5	-340.8	-382.3	-331.5	-256.2	-257.3
SBIC	562.7	557.3	762.2	760.9	845.6	748.1	593.9	596.3
LRI	0.083	0.103	0.072	0.074	0.078	0.103	0.123	0.125

Notes: See Table 1.

the 'financial channel'. Namely, currency misalignment could be expected to influence the real economy mainly via the 'trade channel' and not via the 'financial channel'. In other words, while an undervalued domestic currency could lead to higher international competitiveness – and could stimulate economic growth and cut the duration of the recovery ('trade channel'), an undervalued domestic currency is less likely to be directly linked with an increase in external debt burden ('financial channel'). To conclude, an insignificant effect of *CM* on the duration of economic recovery indicates the absence of the 'trade channel'.

5.4 Robustness Checks

In this subsection, we conduct several robustness checks. The first three regressions in Table 4 analyse further any potential heterogeneities between advanced and emerging economies. While on average the duration of economic recoveries has not proved to be different (see coefficient on *Advanced* in the Table 1), we do not know whether the duration dependence dynamics per se is different between those two groups. Column (1) in Table 4 reports the results for a sub-sample of advanced economies, while column (2) does the same for emerging economies. The magnitude of the duration dependence parameter is higher for advanced than for emerging economies, which might imply that economic recoveries are faster in the former that in the latter. However, we do not know whether this difference is significant or not. To test for the difference between their duration dependence parameter we need to rely on the full sample and allow for a different parameter p for both groups by reparametrizing the baseline hazard function. The respective results are provided in column (3) and show no significant difference (Δp) between the estimated duration dependence parameter for emerging countries (p) and advanced economies ($p + \Delta p$).

However, despite no statistical differences being found both between their duration dependence parameter and (conditional) average durations, we do observe some differences between advanced and emerging economies in what regards the effect of the control variables. While lower investment and longer recessions lead to longer recoveries in both groups of countries – the second with a higher magnitude in the group of emerging countries – the effect of financial development is only observed in the group of emerging countries. Thus, our results indicate that a more developed financial system represents an impediment for a speedy recovery only in emerging economies. This result indicates that in emerging economies, with their poorer regulatory frameworks, a more developed financial system could be more unstable and more prone to engage in over-

lending, resulting in a more substantial deleveraging after the recession, which might then prolong the economic recovery. Advanced economies, with their superior regulatory frameworks, seem to be able to better utilize the possibilities offered by increased financial depth, limiting the negative consequences of higher financial development for the duration of economic recovery.[22] Moreover, our results also show that the exchange rate only influences the duration of economic recoveries in emerging economies. Given that our baseline results demonstrated that the 'financial channel' of the exchange rate dominates the 'trade channel', this finding is not surprising. As emerging economies are much more likely to be forced to borrow in foreign currency (Eichengreen et al., 2007), they are also more vulnerable to an increase in external debt burden caused by an exchange rate depreciation.

In contrast, the magnitude of the previous recession and the level of central bank independence have a significant effect only in the group of advanced economies. In particular, our results show that these economies tend to recover very quickly when the output loss in the previous recession is deep. The finding for the central bank independence could be explained by the fact that it is particularly in advanced economies, with their higher level of rule of law, that the more independent central banks do not yield to government pressure. Instead, they are prepared to focus on achieving their main goal (such as price stability) even at the expense of a slower recovery. Additionally, advanced economies are also more likely to be inflation targeters.

In columns (4) and (5) of Table 4, we exclude the few cases in which preceding recessions lasted more than one year and economic recoveries that took more than three years, respectively. Despite restricting our sample by dropping too long contractions and recoveries, the main results and conclusions of this study remain unchanged.

In the next robustness check, we exclude the observations with extreme values of our primary variable of interest – the baseline financial development (*FinDev*) measure. Moreover, as too large exchange rate depreciations (appreciations) might be associated with currency crises (or other extreme economic shocks with a specific pattern of economic recovery), in this robustness check we also exclude observations with extreme values of *NEER*. We report the results in column (6) of Table 4. Once again, the main results are not affected.

As a final robustness check, we use an alternative filtering technique to obtain

[22]While the higher level of financial development does not seem to have negative consequences in advanced economies, 'too much finance', as studied in subsection 5.2, does seem to have negative consequences in both advanced and emerging economies – albeit more in emerging economies. That is, for advanced economies a highly developed financial system does not seem to be a problem, but a too developed financial system, given the level of economic development, does.

Table 4: Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
gamma	0.130	0.167	0.258**	0.437**	0.230**	0.256*	0.523**
	(0.128)	(0.124)	(0.131)	(0.222)	(0.109)	(0.137)	(0.250)
p	1.578+,d	1.361+,d	1.333+,d	1.385+,d	1.550+,d	1.401+,d	1.358+,d
	(0.083)	(0.073)	(0.064)	(0.072)	(0.059)	(0.060)	(0.048)
$p+\Delta p$			1.464+,d				
			(0.080)				
Δp			0.131				
			(0.087)				
FinDev	-0.8179	-2.2514**	-1.3382***	-1.3312***	-1.0831**	-1.3965***	-0.8235**
	(0.5707)	(0.8999)	(0.4215)	(0.5091)	(0.4308)	(0.4894)	(0.3824)
NEER	0.0027	0.0151*	0.0141**	0.0142**	0.0159***	0.0177**	0.0107**
	(0.0102)	(0.0079)	(0.0058)	(0.0067)	(0.0052)	(0.0080)	(0.0048)
DurRecession	-0.0650**	-0.1512***	-0.1147***	-0.3520***	-0.1466***	-0.1196***	-0.1489***
	(0.0302)	(0.0526)	(0.0286)	(0.0955)	(0.0269)	(0.0305)	(0.0339)
MagRecession	0.1202***	-0.0365	0.0190	0.0206	0.0062	0.0174	0.0009
	(0.0410)	(0.0345)	(0.0439)	(0.0534)	(0.0414)	(0.0461)	(0.0379)
GFCF	0.0534**	0.0543***	0.0397***	0.0438***	0.0347***	0.0375***	0.0018
	(0.0216)	(0.0154)	(0.0130)	(0.0146)	(0.0126)	(0.0128)	(0.0133)
GovDebt	-0.0021	0.0042	-0.0001	0.0002	0.0013	0.0016	0.0006
	(0.0023)	(0.0058)	(0.0021)	(0.0024)	(0.0016)	(0.0021)	(0.0017)
Inflation	0.0124	0.0051	0.0126	0.0126	0.0093	0.0090	0.0092***
	(0.0596)	(0.0098)	(0.0094)	(0.0096)	(0.0101)	(0.0111)	(0.0027)
CBIndep	-0.7340*	-0.7146	-0.8244**	-1.0649**	-0.9348***	-0.7350*	-0.8900***
	(0.4089)	(0.6138)	(0.3529)	(0.4791)	(0.3333)	(0.3942)	(0.3066)
Advanced				0.1233	0.0769	0.0533	0.0417
				(0.2337)	(0.2312)	(0.2313)	(0.2085)
D2000s	-0.1002	0.3809	0.0394	0.0803	0.0976	0.0204	0.0670
	(0.1976)	(0.3259)	(0.1808)	(0.2359)	(0.1894)	(0.1883)	(0.1784)
D2010s	0.3107	0.2721	0.2222	0.2056	0.3314	0.1330	0.2938
	(0.2662)	(0.3894)	(0.2113)	(0.2741)	(0.2405)	(0.2395)	(0.2200)
Observations	177	146	323	250	314	308	369
LogL	-190.5	-176.5	-381.3	-294.6	-345.3	-362.9	-443.2
SBIC	443.2	412.7	837.7	661.0	765.4	800.2	963.2
LRI	0.081	0.127	0.080	0.126	0.097	0.079	0.057

Notes: See Table 1. Regressions (1) and (2) are separate regressions for advanced and emerging countries, respectively. In column (3), $p + \Delta p$ corresponds to the duration dependence parameter for advanced countries; in these regressions, p corresponds to the duration dependence parameter for emerging countries; Δp corresponds to the difference in the duration dependence dynamics. In regressions (4) and (5), recessions that last more than one year and recoveries that took more than three years, respectively, are excluded from the sample. In regression (6), observations with values below -50 or above 50 for *NEER* and below 0.1 and above 0.9 for *FinDev* are also excluded from the sample. In regression (7), the Butterworth filter is used instead of the HP-filter to identify the length of the economic recoveries.

output gap estimates, which we then use to identify the episodes of economic recovery – the Butterworth filter. Namely, for our baseline regressions, we rely on estimates of output gap obtained by the standard Hodrick-Prescott (HP) filter to identify the economic recovery episodes. However, since the output gap estimates might be uncertain, we use an alternative filtering technique. While the HP filter is the by far most commonly used filtering technique for obtaining the output gap estimates, Pollock (2000) argues that the HP filter might sometimes not be able to correctly identify the detrended series. Therefore, Pollock (2000) argues in favor of using the Butterworth filter, which is a filter with a well-defined cut-off point and with a rapid transition. For this robustness check, we identify an alternative set of economic recoveries and we re-run our baseline regression specification with this set of economic recoveries. While the number of economic recovery events increases to 369, as observed in column (7) of Table 4, the main conclusions remain valid, corroborating the robustness of our results even with regards to the use of a different filtering technique to identify economic recoveries.[23]

6 Conclusions

This paper investigates the link between the duration of economic recoveries and the level of financial development. Our contributions to the literature are fivefold. First, we analyse the effect of financial development on the duration of economic recoveries. Second, we use a continuous-time Weibull duration model to assess the presence of duration dependence in those events. Third, we explore whether the effect of financial development on the duration of economic recoveries is driven by 'too much finance'. Fourth, we assess the effect of the size of non-bank financial institutions or shadow banks on the duration of economic recoveries. Fifth, we study whether better regulatory frameworks might limit the negative consequences of 'too much finance'.

We find that economic recoveries are duration dependent, i.e., that their likelihood to end increases with their age. Our results also show that the initial conditions are very important determinants of the duration of the subsequent economic recovery. Economic recoveries tend to last longer when the preceding recession was long, the domestic currency (both in nominal and real terms) is highly depreciated at through, and

[23] In additional experiments, not reported here but available upon request, we also considered the possibility of a change-point in the duration dependence dynamics, following the works of Castro (2013), Agnello et al. (2015) and Agnello et al. (2018). However, no structural break was identified for the duration dependence parameter. On one hand, this might be due to most of the economic recoveries being rather short – the average is lower than one year. On the other hand, this might imply that the duration dependence dynamics of economic recoveries is simply monotonically increasing.

in particular when the economy is more financially developed just before the recovery commencing. That is, countries with higher level of financial development tend to experience slower recoveries after the recession.

Our results show that the findings for the negative effect of financial development on the duration of economic recoveries are driven by 'too much finance'. That is, they show that once the financial system becomes too developed, when compared to what the level of economic development would warrant for, it starts to hinder a speedy economic recovery once a recession had struck. Presumably owing to higher volatility of a too large financial system, as well as to the provision of lending to fund unproductive and risky investments. The resulting deleveraging in the post-recession period might thus limit the provision of credit during the economic recovery, which might then make the recovery longer.

In line with this argument, we also find robust evidence that the effect of financial development is mainly driven by the level of development of financial institutions and not so much by the level of financial markets development. We also find some tentative evidence that among the financial institutions, the non-bank financial institutions (or shadow banks) seem to drive these results. However, we also show that a more efficient regulatory framework could limit the negative consequences of financial development for the duration of economic recoveries.

In what regards the other determinants of the duration of economic recoveries, higher investments, expansive fiscal and monetary policies make economic recoveries shorter, while a higher level of central bank independence seems to prolong them. Moreover, emerging economies have proved to be the ones in which economic recoveries are mostly affected by the exchange rate dynamics and the level of financial development.

These findings have important policy implications and gain particular relevance in the current economic environment. While the importance of a well-developed financial system for long-term economic growth had already been noted, our results show that a too high level of financial development might hinder a robust and speedy economic recovery. Therefore, our results underline the importance of an efficient regulatory framework, which facilitates the growth of financial system but also prevents it from becoming too large. Moreover, our results also underline the importance of an efficient regulation of the non-bank financial institutions. Namely, there is empirical evidence that a stricter capital regulation of banks contributes to the growth of shadow banking (Hodula et al., 2020). As a result, shadow banking should not be omitted from the financial regulations, as too large shadow banking sector might also prolong the economic recovery after the recession.

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Appendix

Table A1: List of Countries

Australia	Hungary	Peru
Austria	Iceland	Philippines
Bahrain	India	Poland
Belgium	Indonesia	Portugal
Bolivia	Ireland	Qatar
Brazil	Israel	Romania
Canada	Italy	Russia
Chile	Japan	Saudi Arabia
China	Korea	Singapore
Colombia	Latvia	Slovak Republic
Croatia	Lithuania	Slovenia
Cyprus	Luxembourg	South Africa
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Denmark	Malta	Sweden
Dominican Republic	Mexico	Switzerland
Estonia	Moldova	Taiwan
Finland	Morocco	Thailand
France	Netherlands	Turkey
Georgia	New Zealand	Ukraine
Germany	North Macedonia	United Kingdom
Greece	Norway	United States
Hong Kong	Paraguay	Uruguay
		Venezuela

Table A2: Description of the Variables

Variable	***Description***	***Source***
DurEconRecov	Duration of the economic recovery, measured as the number of quarters from the quarter after the through until the output gap turns positive.	own calculations
FinDev	Composite index of financial development at through.	Svirydzenka (2016)
FinInstDev	Index of financial institutions development at through; sub-index of FinDev	Svirydzenka (2016)
FinMktDev	Index of financial markets development at through; sub-index of FinDev	Svirydzenka (2016)
Bank	Deposit money banks' assets to GDP (%) at through	WB
Shadow	Nonbank financial institutions' assets to GDP at through (%)	WB
CBIndep	Central Bank Independence index at through.	Garriga (2016)
RegQuality	Index of Regulatory Quality at through, takes values from -2.5 to 2.5	WB
EconFreedom	Index of economic freedom at through.	The Heritage Foundation
PropertyRights	Index of property rights at through.	The Heritage Foundation
DurRecession	Duration of the previous recession: duration of the output gap recession measured as the number of quarters from when the output gap turns negative until the subsequent through.	own calculations
MagRecession	Magnitude of the previous recession: output gap at through; % of potential output.	own calculations
GFCF	Gross fixed capital formation at through; % of GDP.	IMF, WB
GovDebt	Central government debt at through, % of GDP.	IMF
Inflation	Annual % change in consumer price index at through.	IMF, TR
NEER	Nominal effective exchange rate at the through, broad index, indirect quotation, annual % change; positive (negative) values represent appreciation (depreciation).	IMF, BIS
REER	Real effective exchange rate at through, broad index, indirect quotation, annual % change; positive (negative) values represent appreciation (depreciation).	IMF, BIS
CM	Real currency misalignment: deviation of actual REER and equilibrium REER at through; % of equilibrium REER; positive (negative) values represent overvaluation (undervaluation).	CEPII
SovRestruct	Dummy variable that takes the value of 1 for when sovereign debt restructuring episodes occur within a year before the start of the economic recovery, and 0 otherwise.	Laeven and Valencia (2020)
FiscalImpulse	Fiscal impulse at through; computed as the change in government primary net lending as percentage of GDP times the ratio between the lag of real GDP and the lag of potential GDP.	own calculations following Grigoli and Hakura (2010)
GovNetLending	Government primary net lending at through; % of GDP.	IMF
RMCI	Real monetary conditions index at through; computed as 0.75*cyclical component of *REER* from HP Filter + 0.25*cyclical component of *CBRate* from HP Filter.	own calculations
CBRate	Central bank key interest rate at through.	IMF, TR
Advanced	Dummy variable that takes the value of 1 for advanced economies, and 0 otherwise.	IMF

Notes: Real GDP data to compute the output gap and *DurEconRecov* were obtained from IMF. IMF = International Monetary Fund; BIS = Bank for International Settlements; CEPII = Centre d'Etudes Prospectives et d'informations Internationales; WB = World Bank; TR = Thompson Reuters.

Table A3: Descriptive Statistics

Variable	***Obs***	***Mean***	***Std. Dev.***	***Min***	***Max***
DurEconRecov	414	3.68	3.15	1	18
FinDev	384	0.47	0.23	0.07	0.99
FinInstDev	384	0.50	0.24	0.00	0.99
FinMktDev	384	0.38	0.25	0.00	0.97
Bank	392	78.57	49.29	6.02	246.89
Shadow	121	28.34	40.58	0.00	160.11
CBIndep	397	0.60	0.20	0.08	0.88
RegQuality	255	0.75	0.81	-1.97	2.24
EconFreedom	350	66.15	9.23	33.85	89.78
PropertyRights	350	63.43	22.61	3.75	95.00
DurRecession	411	3.36	2.87	1	22
MagRecession	411	-4.06	4.66	-25.03	-0.51
GFCF	394	22.54	6.04	7.70	43.99
GovDebt	368	46.37	31.34	1.26	198.02
Inflation	399	8.00	20.35	-5.75	273.43
NEER	399	-2.08	12.78	-72.27	61.16
REER	397	-0.14	11.44	-59.01	134.27
CM	377	-2.34	12.89	-40.81	36.71
SovRestruct	405	0.01	0.10	0	1
FiscalImpulse	350	-0.38	2.17	-11.68	7.22
GovNetLending	362	-0.47	3.49	-19.59	11.94
RMCI	359	-0.37	14.39	-205.37	115.21
CBRate	304	8.50	12.16	-0.25	79.00

Notes: See Table A2 for the description of the variables. This table reports the number of observations (Obs), mean (Mean), standard deviation (Std.Dev.), minimum (Min) and maximum (Max) observed values for each variable. The number of observations corresponds to the total number of economic recovery spells/events observed.

Table A4: Financial Institutions and Duration of Economic Recoveries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
gamma	0.602	0.306*	0.279**	0.321*	0.456	0.322	0.311	0.347	0.537
	(0.458)	(0.211)	(0.175)	(0.212)	(0.308)	(0.291)	(0.256)	(0.289)	(0.428)
p	1.366+,d	1.337+,d	1.358+,d	1.366+,d	1.362+,d	1.380+,d	1.420+,d	1.426+,d	1.436+,d
	(0.068)	(0.068)	(0.067)	(0.068)	(0.068)	(0.064)	(0.051)	(0.056)	(0.048)
FinDev	-2.6091*								
	(1.3356)								
Bank		-0.0068		-0.0056					
		(0.0073)		(0.0072)					
Shadow			-0.0074**	-0.0069***					
			(0.0030)	(0.0023)					
ShadowShare					-1.5817**				
					(0.6891)				
Bank3yr						-0.0062		-0.0053	
						(0.0081)		(0.0081)	
Shadow3yr							-0.0085***	-0.0081***	
							(0.0032)	(0.0025)	
ShadowShare3yr									-1.9111***
									(0.6814)
NEER_appre	-0.0347**	-0.0451**	-0.0302	-0.0325	-0.0262	-0.0489*	-0.0324	-0.0342	-0.0269
	(0.0167)	(0.0213)	(0.0196)	(0.0206)	(0.0203)	(0.0260)	(0.0256)	(0.0274)	(0.0247)
NEER_depre	-0.0271	-0.0340	-0.0333	-0.0339	-0.0332	-0.0440	-0.0479	-0.0480	-0.0462
	(0.0291)	(0.0278)	(0.0287)	(0.0279)	(0.0273)	(0.0321)	(0.0339)	(0.0331)	(0.0320)
DurRecession	-0.1162*	-0.1440**	-0.1407**	-0.1416**	-0.1414**	-0.1759***	-0.1810***	-0.1804***	-0.1892***
	(0.0668)	(0.0662)	(0.0668)	(0.0666)	(0.0699)	(0.0604)	(0.0631)	(0.0635)	(0.0660)
MagRecession	0.0623	0.0340	0.0652	0.0616	0.0685	0.0563*	0.0838**	0.0883**	0.0924***
	(0.0485)	(0.0453)	(0.0519)	(0.0528)	(0.0507)	(0.0317)	(0.0352)	(0.0360)	(0.0341)
GFCF	0.0360	0.0411*	0.0313	0.0344	0.0274	0.0423*	0.0329	0.0362	0.0283
	(0.0239)	(0.0214)	(0.0224)	(0.0231)	(0.0243)	(0.0248)	(0.0257)	(0.0260)	(0.0263)
GovDebt	0.0036	0.0052	0.0061**	0.0079*	0.0039	0.0047	0.0060**	0.0079*	0.0034
	(0.0031)	(0.0039)	(0.0031)	(0.0044)	(0.0025)	(0.0042)	(0.0029)	(0.0047)	(0.0022)
Inflation	0.0048	0.0067	0.0035	0.0045	0.0024	0.0082	0.0078	0.0092	0.0050
	(0.0202)	(0.0206)	(0.0209)	(0.0206)	(0.0201)	(0.0228)	(0.0233)	(0.0230)	(0.0229)
CBIndep	-2.2492**	-1.7866*	-1.3076*	-1.6941*	-1.3121*	-1.2931	-0.9389	-1.3089	-0.8761
	(0.9118)	(0.9341)	(0.7324)	(1.0062)	(0.7264)	(0.9659)	(0.6950)	(1.0394)	(0.6881)
Advanced	0.3756	-0.1597	-0.2487	-0.0438	-0.3389	-0.2255	-0.3236	-0.1218	-0.3830
	(0.4681)	(0.3829)	(0.3132)	(0.3842)	(0.3109)	(0.4340)	(0.3569)	(0.4536)	(0.3534)
D2000s	0.7981	0.4077	0.3177	0.5140	0.1045	0.1468	0.1167	0.3072	-0.1363
	(0.5583)	(0.5097)	(0.4027)	(0.5505)	(0.4423)	(0.5081)	(0.4179)	(0.6010)	(0.4569)
D2010s	0.9129	0.6862	0.3785	0.6797	0.2216	0.5517	0.2960	0.5837	0.1169
	(0.6173)	(0.6344)	(0.4655)	(0.7005)	(0.4775)	(0.6738)	(0.4959)	(0.7969)	(0.5147)
Observations	102	104	104	104	104	95	95	95	95
LogL	-117.7	-122.7	-120.7	-120.1	-120.1	-107.7	-104.9	-104.4	-103.6
SBIC	300.1	310.4	306.4	309.9	305.2	279.2	273.6	277.1	271.0
LRI	0.122	0.108	0.122	0.126	0.126	0.136	0.159	0.163	0.169

Notes: See Table 1. *ShadowShare* stands for the share of *Shadow* out of total financial sector (*Bank* + *Shadow*). *3yr* indicates that the variable takes the value of 3 year average before the recovery.

Table A5: Real Exchange Rate and Currency Misalignment

	(1)	(2)	(3)	(4)
gamma	0.256*	0.330*	0.318*	0.283*
	(0.135)	(0.173)	(0.164)	(0.147)
p	1.383+,d	1.393+,d	1.384+,d	1.387+,d
	(0.058)		(0.058)	(0.057)
FinDev	-1.2947***	-1.2661***	-1.6002***	-1.5571***
	(0.4770)	(0.4629)	(0.4897)	(0.4849)
REER	0.0143*			
	(0.0079)			
REER_appre		-0.0101		
		(0.0221)		
REER_depre		-0.0315**		
		(0.0152)		
CM			-0.0053	
			(0.0069)	
CM_overval				0.0052
				(0.0105)
CM_underval				-0.0145
				(0.0110)
DurRecession	-0.1160***	-0.1141***	-0.1069***	-0.1066***
	(0.0297)	(0.0294)	(0.0272)	(0.0277)
MagRecession	0.0157	0.0139	0.0295	0.0287
	(0.0452)	(0.0445)	(0.0520)	(0.0522)
GFCF	0.0384***	0.0356***	0.0293**	0.0283**
	(0.0128)	(0.0124)	(0.0114)	(0.0116)
GovDebt	0.0009	0.0007	0.0014	0.0015
	(0.0021)	(0.0022)	(0.0024)	(0.0024)
Inflation	0.0028	0.0055	-0.0090	-0.0099
	(0.0090)	(0.0103)	(0.0086)	(0.0085)
CBIndep	-0.7962**	-0.9393**	-0.6416	-0.5802
	(0.3880)	(0.3788)	(0.4183)	(0.4195)
Advanced	0.0979	0.0425	0.1505	0.1670
	(0.2282)	(0.2359)	(0.2221)	(0.2205)
D2000s	-0.0078	0.0399	0.0735	0.0343
	(0.1959)	(0.1995)	(0.2008)	(0.1993)
D2010s	0.1460	0.1279	0.1606	0.1006
	(0.2420)	(0.2518)	(0.2508)	(0.2571)
Observations	322	322	321	321
LogL	-383.8	-381.7	-383.7	-383.0
SBIC	842.7	844.2	842.5	846.7
LRI	0.073	0.078	0.064	0.066

Notes: See Table 1. REER appreciation (*REER_appre*) and depreciation (*REER_depre*) and CM overvaluation (*CM_overval*) and undervaluation (*CM_underval*) are obtained is the same fashion as NEER appreciation (*NEER_appre*) and depreciation (*NEER_depre*).

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