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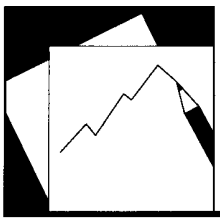

IMF Working Paper

International Evidence on Recovery from Recessions

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International Evidence on Recovery from Recessions

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Abstract

Although negative shocks have persistent effects on output on average, this paper shows that macroeconomic policies and the structure of the economy can influence the speed of recovery and mitigate the persistence of the shock. Indeed, monetary and fiscal stimulus and foreign aid can spur a rebound, with impacts that are asymmetrically stronger than in non-recovery years. Real depreciation and the exchange rate regime also have asymmetric growth effects in a recovery year relative to other years of expansion. Recoveries are more sluggish in open economies, partly because fiscal policy is less effective than in closed economies.

JEL Classification Numbers: C23; E32; F43; O43

Keywords: Economic recovery; Growth; Recession; Business cycles; Rebound; Output loss

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Contents Page

I. INTRODUCTION

The objective of this paper is to present a series of stylized facts on how countries recover from recessions. Recent literature demonstrates that negative shocks, particularly financial crises, can generate a sizeable permanent loss in the level of output compared with the pre-crisis trend (Cerra and Saxena, 2008). According to this literature, the persistent impact on the trend holds for advanced, emerging market, and developing countries, on average.[2] This finding challenges the standard textbook conception of the business cycle, depicted as a transitory deviation around a stationary trend. It also questions whether the finding that the US economy rebounds from recession (Kim, Morley, and Piger, 2005) can be generalized to countries outside the US.

Our paper relates to the recent literature which studies the frequency and output losses associated with different types of shocks across different groups of countries and the determinants of the duration of output contractions. For example, Becker and Mauro (2006) document the frequency, duration, and overall output costs (measured as the cumulative yearly output losses relative to the pre-event GDP per capita) of various real, financial, and sociopolitical shocks. They find that financial and macroeconomic shocks are among the most costly for emerging market countries and terms of trade and interest rate shocks are the most costly for developing countries. Kaminsky and Reinhart (1999) provide an event study of banking and balance of payment crises, demonstrating the behavior of macroeconomic variables in a three year window around the event as well as variables that best signal an impending crisis. Cerra and Saxena (2005a) show that half of all economic contractions are associated with political or financial crises, and the higher incidence of crises in lower income countries is an important reason for unconditional divergence in the postwar growth data. Hausmann, Rodriguez, and Wagner (2006) find that countries enter growth collapses for multiple reasons, including wars, export collapses, sudden stops and political transitions, but that most of these variables do not help predict the duration of crises episodes. Instead, they find that a measure of the density of a country's export product space is significantly associated with lower crisis duration.

This literature on the signals, depth, and duration of recessions pays less attention to how the recovery rate and persistence are affected by the policy responses and structural features of countries. We try to fill that gap in this paper.

Asymmetry in the business cycle—the idea that recessions are different from expansions—has been emphasized by scholars dating back at least to Mitchell (1927). In particular, recessions are characterized as abrupt, violent, but short-lived contractions, juxtaposed to smoother and longer-lived expansions. Modern time series econometricians have formalized these ideas by developing models in which economic behavior depends on regime switching among states governed by different transition probabilities (Hamilton, 1989). Recently, Lo and Piger (2005) extend the idea to asymmetries in the response of U.S. output to policy actions of the Fed, and find that actions taken during recessions have larger effects than those taken during expansions. In this paper, we will examine asymmetries in the

[2] In a decomposition of output fluctuations in emerging market countries into components arising from permanent and transitory shocks, Cerra and Saxena (2005b) demonstrate that the permanent shocks account for most of the variation in the data.

response to policies and country characteristics in the recovery phase of an economic expansion relative to later years in the expansion. In particular, we look for factors associated with either a rapid output bounce back, normal expansion growth, or sluggish growth following a recession.

This paper shows that some macroeconomic policy responses *are* associated with faster than average rebound from recessions. Structural policies and country characteristics also influence the speed of the recovery. In addition, we unearth several examples of asymmetric responses to macroeconomic policy actions and regimes. Our results suggest that monetary policy (in advanced countries) and fiscal policy are more effective in boosting output during a rebound from recession than in later stages of an expansion. In addition, a floating regime lifts growth in recovery even if it performs worse than a fixed regime in other expansion years. A surprising result (which is, however consistent with the findings of Cerra and Saxena, 2005a) is that countries that are more open to trade tend to have slower recoveries. We show that this finding is partly due to the fact that fiscal policy is less effective in more open economies.

II. Methodology and Data

We estimate a simple panel data model for growth rates across countries and over time. We include country fixed effects to account for all time-invariant factors that impact the average long run growth rate of each country. For instance, the country effects control for the influence of fixed institutional and geographic characteristics as well as the initial level of per capita income. Thus, the focus of our analysis is on the growth variation or business cycle fluctuations that occur within a country over time. In particular, we concentrate on the rebound of growth in the aftermath of a recession and the interaction of the rebound with a set of policy variables and country characteristics.

The model takes the following general form:

$$GROWTH_{i,t} = \beta\ TROUGH_{i,t-1} + \gamma\left(TROUGH_{i,t-1} * \left(X_{i,t} - \overline{X}\right)\right) + \delta\left(X_{i,t} - \overline{X}\right) + \alpha_i + \varepsilon_{i,t} \qquad (1)$$

A recovery is defined to be the year(s) of positive growth immediately following a trough, where the trough is the final year in a sequence of years with negative annual growth. Accordingly, the variable $TROUGH_{i,t-1}$ is a dummy variable indicating that the trough of a recession had occurred in the previous year, and a recession is defined as one or more years of negative annual growth.[3] As the recovery year is an expansion by construction, its growth rate should not be compared to all years for which we have data because they would include both expansions and contractions. Thus, we follow Cerra and Saxena (2005a) and restrict the sample to years with positive GDP growth. Within the set up of Equation (1), β measures the speed of the recovery from recession, compared with all other years of positive growth. A

[3] As our recession dates are constructed from negative *annual* growth rates, they may not correspond fully with other recession timing conventions such as two consecutive quarters of negative growth. For the U.S., our recession dates match NBER timing, except for NBER recessions of 1970 and 2001 in which a small but positive annual growth rate is registered.

positive β can be taken as an indication that, in the post recession year, countries quickly converge to their long-run trend. A negative β would instead signal a slow recovery and a potentially large loss of output (see Cerra and Saxena, 2008, for details).

In our baseline estimations, we confine our analysis to the first year of the recovery, as Cerra and Saxena (2005a) find that subsequent recovery years cannot be distinguished from other expansion years in the business cycle. However, we also run a set of robustness tests in which we substitute $TROUGH_{i,t-1}$ with a dummy variable that takes a value of one in the first two years of the recovery.

The variable $X_{i,t}$ denotes a policy or structural variable that may or may not change over time.[4] Therefore, δ captures the correlation between this variable and GDP growth in "normal" expansion years and γ captures the asymmetric impact of $X_{i,t}$ on speeding or slowing the recovery from a recession. Thus, $\gamma + \delta$ measures the total effect of variable $X_{i,t}$ in recovery years (note that if $X_{i,t}$ only varies across countries and not within countries, the term δX_i will become collinear with the country fixed effects α_i and drop from equation (1)). Lastly, $\varepsilon_{i,t}$ is the error term.

We estimate Equation (1) for several groups of countries, and compare the responses across groups. We show results for all countries (ALL), industrial countries (IND), developing countries (DEV), developing countries excluding Sub-Saharan Africa (DEV NO SSA), and Sub-Saharan Africa (SSA). The data consist of annual observations spanning 1960 to 2005 and covering up to 197 countries, yielding an unbalanced panel of up to 5482 observations. The use of annual observations is necessary for such a cross-country analysis, as most country data is not available on a higher frequency. An advantage of using annual data relative to data of a higher frequency is that we need not be concerned with seasonality that would introduce measurement error into the analysis. Data sources for the regressors are described in the Appendix. The data on policy variables is often incomplete for many countries in the sample, and some variables are available for a given country, others may be missing. Thus, to estimate a model with all policy variables included, the sample would be severely restricted. To avoid this problem, we focus on regressions of subsets of the variables rather than all variables together.

Equation (1) has the advantage of controlling for long run growth rates that differ based on country specific characteristics. An alternative specification, used in previous studies (Calvo, Izquierdo, and Talvi, 2006; Becker and Mauro, 2006; Hausmann, Rodriguez, and Wagner, 2006), defines a recovery as the length of time until the previous peak level of output is regained. However, for a given output loss during the recession, the recovery time following a trough would vary inversely with the country's long run growth rate. Thus, such

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[4] We use the standard practice of subtracting from $X_{i,t}$ its cross-country mean $\bar{X} = \frac{1}{NT}\sum_i \sum_t X_{it}$, so that β can be interpreted as the speed of recovery for country-years with average X. That is, $\frac{\partial growth_{it}}{\partial trough_{it}} = \beta + \gamma\left(X_{it} - \bar{X}\right)$.

an alternative specification could potentially introduce systematic bias into the calculations. We avoid this by including country fixed effects and measuring differences in growth rates between normal and recovery phases rather than differences in the time required to reach previous levels of output.

III. RESULTS

GDP growth in recovery years is typically slower than GDP growth in other expansion years. Table 1 estimates equation (1) by setting $\gamma = \delta = 0$ and shows that the difference between GDP growth in recovery years and GDP growth in other expansion years is particularly large in the sub-sample of industrial countries (column 2). In this sub-sample, growth is a full percentage point lower in recovery years than in other expansion years. In the sub-sample of developing countries, the difference between recovery and other expansion years is 0.36 percentage points (column 3), but if Sub-Saharan Africa is excluded from the group of developing countries, this differences reaches ¾ of a percentage point (column 4).[5] Only in Sub-Saharan Africa is there evidence, albeit not statistically significant, for a rebound in the recovery year (column 5). The latter result is likely due to the large share of civil war shocks in Sub-Saharan African countries, which Cerra and Saxena (2008) find lead to a partial rebound.

Since very small countries are often very volatile, in Table 2 we exclude all countries with less than one million inhabitants.[6] We still find that in the subsamples of industrial countries (column 2) and non-African developing countries (column 4) GDP growth in recovery years is significantly lower than GDP growth in other expansion years. In Table 3, we check if country size affects the speed of the recovery (possibly because larger economies are more diversified) but find no evidence in this direction.[7]

Macroeconomic policy stance and conditions

Among the key interests of this paper is to determine the role of macroeconomic policies and conditions in influencing the process of recovery out of recession. In particular, we are interested to understand the role of policy in affecting the growth or the recovery rate and thus have the following general model in mind:

$$growth_t = \alpha + \beta\ macropolicy_t + \varepsilon_t$$

where the macro policy variable can include monetary or fiscal stimulus, foreign aid, the exchange rate regime, and exchange rate changes. If the policy variable is defined to

[5] Slower growth in the first recovery year may partly relate to the recovery taking hold only part way into the year, although this effect may be balanced by other cases of recoveries that begin toward the end of the trough year.

[6] This is our favorite sample and the remainder of the analysis will focus on this sub-sample of countries (the results are robust to using all countries for which we have data). In this subsample we have a total of 550 recovery episodes. Of these 550 episodes, 63 are in the advanced economies and 487 in the developing countries (229 episodes in Sub-Saharan Africa and 258 episodes in developing countries outside SSA).

[7] LSIZE is a time-invariant measure of economic size and is equal to the log of USD total GDP averaged over 1960-2004.

represent macroeconomic stimulus, we hypothesize that $\beta > 0$ and look for confirming evidence. But as a standard problem, the value of β can be biased due to reverse causation, or endogeneity, in which an increase in the growth rate induces policy makers to set a contractionary stance, and vice-versa. Reverse causation takes the form:

$$macropolicy_t = c + \theta\ growth_t + u_t$$

An increase (decrease) in growth may induce a macro policy contraction (expansion), potentially leading to a coefficient $\theta < 0$. As these two relationships produce opposite signs in the correlation of the policy and growth variables, the simple OLS estimate of β would likely be biased toward zero. Thus, we may not be able to find any impact of policy on growth even if it is present. For example, under Keynesian and other macroeconomic theories, an increase in the fiscal deficit would increase growth. On the other hand, an increase in growth for exogenous reasons would likely generate a fiscal surplus, due to the functioning of automatic stabilizers (e.g., features of the legal tax system that increase tax revenue as growth rises) and explicit countercyclical policy actions of the government. The operation of the second effect would make it difficult to find evidence of the first effect, incorrectly leading to the conclusion that fiscal stimulus (from higher deficits) do not raise growth. For these reasons, much literature concerned with estimating the effect of policy attempts to identify and use exogenous policy changes (those unrelated to the contemporaneous state of the economy) to measure the impact on growth (Romer and Romer, 1989). A related literature that estimates vector autoregressions makes an ordering assumption that growth is in the information set of the policymaker and contemporaneously affects policy decisions, but the stance of policy has only a lagged effect on growth (Christiano, Eichenbaum, and Evans, 1999).

We deal with the issue of endogeneity in two ways. First, for fiscal and monetary policy we employ the ordering identification scheme used in the VAR literature. Namely, we assume that policy affects growth only with a lag, and thus use the lagged value of the policy variable as a regressor.[8] For example, the fiscal deficit in the trough year of the recession would impact growth in the first recovery year of the expansion. "Policy," in this context, refers to the overall stance of a particular macroeconomic variable, not only the exogenous component, but is predetermined with respect to growth. Second, we focus on the *asymmetric* impact of the policy stance on the growth rate in the recovery year relative to impact of policy on growth in the later years of the expansion phase of the business cycle. Combining these two strategies, we recognize that some of our results on the direct effect of policy on growth (coefficient δ in equation 1) may be insignificant due to the endogeneity issue, but we have more confidence in the estimate of the asymmetric impact, γ. Moreover, since the bias is towards not finding any effect, we are confident that, when we do find an effect what we report is likely to be a lower bound of the true impact of policies on the speed of recovery.

We find that expansionary monetary policy is a powerful tool for recovery in industrial countries, but not in developing countries (Table 4). In particular, we find that in

[8] In the case of exchange rate regime and appreciation we use contemporary data because years of crisis (which would be captured by the lagged value of these variables) are often characterized by large exchange rate volatility. In the case of foreign aid, we use the lagged value (but results do not change if we use the current value).

developing countries the real growth rate of broad money—lagged by one year to take account of time delays in its transmission—is positively correlated with GDP growth during economic expansions. The point estimates suggest that a ten percentage point increase in the growth rate of real money is associated with a half percentage point increase in GDP growth (columns 3 and 4). However, we find that in developing countries monetary policy plays no special role in recovery years. In industrial countries, instead, we find an asymmetry in the power of monetary policy. It has a strong impact on rebounding from recession; yet in other expansion years, its impact on growth, although positive, is insignificant (column 2).[9] While reverse causality is likely to be the source of the insignificant relationship between output growth and monetary growth in normal years, it is unlikely that reverse causality is the source of the asymmetric effect identified in column 2 (in fact, reverse causality may lead to attenuation rather than amplification bias).

Expansionary fiscal policy is also powerful for accelerating recovery in both industrial countries and non-SSA developing countries (Table 5). We measure fiscal policy as the ratio of the fiscal deficit to GDP, again lagged by one year to allow for delays in transmission. For all countries and subgroups other than SSA, fiscal deficits typically have an insignificant impact on growth, a result that may be due to endogeneity as discussed above. However, we find an asymmetry in its power: expansionary fiscal policy is potent for raising growth in a recovery year. An increase in the deficit by one percent of GDP raises the post-recession rebound by 0.12 percentage points (columns 2 and 4). To ensure that this result is not driven by changes in the denominator of the ratio, we next measure the fiscal deficit relative to a measure of trend GDP. Table 6 shows that the impact of fiscal policy in recovery is robust to this alternative measure. To reiterate the earlier discussion, we do not imply that the result measures the impact of exogenous discretionary fiscal policy on recovery growth. Instead, the result would be a combined effect of both discretionary policy and automatic stabilizers. We do not attempt to distinguish between these two factors, as there is no obvious reason why a fiscal deficit arising from automatic stabilizers would be more less effective than a deficit arising from explicit policy changes.

In Sub-Saharan Africa, foreign aid speeds the rebound from recessions. There is a voluminous literature that debates the impact of foreign aid on economic growth. The pessimistic strand of the literature argues that aid has no effect on growth (Rajan and Subramanian, 2008; Easterly, Levine and Roodman, 2004) and aggravates instability (Bulíř, and Hamann, 2003). The optimistic strand argues that some *types* of aid can have an identifiable positive impact on growth (Clemens, Radelet, and Bhavnani; 2004). We find that foreign aid has a positive but insignificant effect on growth in a typical expansion year (Table 7). However, we find an important asymmetry: aid has a statistically and economically significant effect on fueling a rebound from recession.

A floating exchange rate regime facilitates rebound from recession, even when it is not the best regime for growth over the longer run. We use the Levy Yeyati and Sturzenegger (2005) measure of exchange rate regimes, as divided into broad categories of floating, intermediate, and fixed regimes. We find that floaters experience recovery growth rates that are more than a percentage point higher than recovery growth rates in countries with fixed and intermediate exchange rate regimes (Table 8). In Table 9, we compare the relative

[9] Money growth worsens the recovery in Sub-Saharan Africa, although the sample size is too small to be confident in the result.

performance of fixed and intermediate regimes. For developing countries, fixed regimes are associated with highest rates of growth over an entire expansion, performing better than intermediate or floating. However, fixed and intermediate regimes have a detrimental impact on rebound from recession relative to floating rates, with the intermediate regime imposing a large restraint on recovery.[10] This finding would bolster the view of those who have argued that countries should move to corners of either very flexible or institutionally fixed regimes (Fischer, 2001). In industrial countries, there is a monotonic ranking of regimes: fixed regimes perform worst in recoveries and floats perform best. In Tables 10 and 11, we show that intermediate and fixed regimes hinder recovery even when we control for recessions and recoveries associated with currency crises.[11]

We find an asymmetric effect of real appreciation on growth in recovery relative to other years. Theory would predict that an appreciation of the exchange rate would curtail net exports and thereby have a detrimental impact on growth. Yet, in most years of economic expansion, an appreciation of the real exchange coincides with higher rates of growth (for instance, column 1 of Table 12 shows that a ten percentage point appreciation of the real exchange rate is associated with a 0.16 percentage points increase in GDP growth). However, this positive relationship is likely to be driven by reverse causality, with higher growth causing a real appreciation. When we focus on our attention on recovery years (and thus mitigate the reverse causality problem), we find that the negative effect of real appreciation on growth dominates, with a large and statistically significant impact for developing countries, particularly those of SSA.[12] The result holds up even when we control for recessions and recoveries related to currency crises (Table 13).

Structural policies

Labor market rigidities are a plausible structural impediment to adjustment. Blanchard and Wolfers (2000) attribute Europe's rise in unemployment to the interaction of bad shocks and labor market institutions that determine the role of the unemployed in wage setting. They find that shocks have a larger and more persistent effect in countries with poor labor market institutions that deter the reabsorption of the unemployed into work once economic conditions improve. In the same spirit, Table 14 relates recovery rates to a time-invariant index of labor market rigidities assembled by the World Bank. The relationship is insignificant, which may reflect that not all labor market regulations are strictly enforced and thus may not be binding. Consequently, we also investigate the extent to which countries enforce laws (EROE is obtained by multiplying ROE with the Kaufman et al., 2008, index of

[10] Levy Yeyati and Sturzenegger (2003) show that countries with fixed and intermediate exchange rate regimes grow at a slower rate *vis a vis* countries with floating regimes. Our result suggests that their finding may be driven by difference in growth during recovery (and possibly recession) years.

[11] In Tables 10 and 11, we jointly use the first and the second lag of the currency crisis dummy. Thus, the currency crisis interaction will take value one if there was a currency crisis at time t-1 or time t-2. Using just one lag would yield very few cases in which the interaction takes a value different from zero.

[12] This finding is consistent with previous analyses that have shown that real depreciation facilitates economic recovery (IMF, 2007, UNCTAD, 2008).

rule of law) so that labor market rigidities would be effective. Indeed, Table 15 presents some evidence that countries with *effective* labor market rigidities experience sluggish recoveries. The results, however, are not very strong.[13]

Next, we look at the role of trade and capital account openness. Puzzlingly, we find that trade openness reduces the speed of recovery for emerging market and developing countries (the effect is positive but not statistically significant in the industrial countries), and this result is independent of the impact of growth in trading partners. We measure trade openness as the sum of exports and imports relative to GDP, and calculate this as an average over 1970-2000 in order to reduce simultaneity bias that would arise from calculating openness using annual data that is contemporaneous with GDP. Openness reduces the speed of recovery (Table 16) such that for each additional 10 percent of trade to GDP, growth in the rebound is 0.17 percentage points lower than otherwise (column 3 and 4; when we restrict our sample to Sub-Saharan Africa, we find a similar coefficient which, however, is no longer statistically significant, column 5).

We conjecture that openness may be correlated with economic size of the country, but the link between greater trade openness and sluggish recovery strengthens when we control for economic size (Table 17). However, we now find that trade openness may speed up recovery for very large non-African developing countries (the triple interaction LTROUGH*OPEN*LSIZE is positive and statistically significant in column 4). The point estimates suggest that the effect of openness becomes positive when LSIZE reaches 25.4 (we obtain this number by adding the mean of LSIZE for the subsample of column 4 –which is 23.3—to 2.08=0.0183/0.0088). There are, however, only 9 countries in our sample with LSIZE greater than 25.4 (Turkey, Saudi Arabia, Poland, South Korea, India, Russian Federation, Mexico, Brazil, and China) and an F test on the sum of the two coefficients shows that the positive effect of OPENNESS is not statistically significant even for the country with the largest LSIZE (China with 26.8, the p-value of the test is 0.33).

Naturally, economies with greater reliance on external trade would be more sensitive to shocks to GDP growth in trading partners. Thus, we construct a measure of real external shocks as real GDP growth rates of trading partners weighted by export shares (see Jaimovich and Panizza, 2007 for details). In Table 18, we find the direct impact of trading partner growth to be large and significant for all countries as well as industrial and developing country subgroups. Controlling for this direct effect, strong growth in trading partners has an equally large significant impact on the recovery rebound for developing, but not industrial countries.[14] However, the negative impact of trade openness remains even when controlling for partner country growth.

Another possibility is that more open countries experience milder recessions than less open countries and therefore they recover at a slower rate. However, by regressing openness on recession depth, we found that these two variables are not correlated. We also tried splitting our sample into two groups of equal size (classifying as more open countries with a

[13] We also tried to use a time-variant index of labor market rigidities assembled by Nickell and Nunziata (2001) and only available for OECD countries. Also in this case we found no significant effect of labor market rigidities.

[14] The regressions of Table 18 do not include G7 countries because for this group of countries the external shocks may be endogenous with respect to GDP growth (Jaimovich and Panizza, 2006).

degree of openness above the median and as less open as countries with a degree of openness below the median) and found that the average depth of recessions in the two groups is basically identical. Finally, in Table 19 we control for the dept of the recession (LDEPTH) and its interaction with the trough dummy (LDTR) and we still find that more open economies have slower recoveries (in fact the coefficient of the LTROUGHOPEN interaction is nearly identical to that of Table 16).

Our previous result that fiscal policy is effective in speeding up the recovery, together with the standard result that fiscal policy multipliers tend to be smaller in more open economies, could explain why more open economies recover at a slower rate. In Table 20 we check whether our result that open economies recover at a slower rate is driven by ineffective fiscal policies by interacting fiscal policy with the degree of openness. We find strong support for the hypothesis that fiscal policy is less effective in more open economies. The triple interaction between speed of recovery, openness and fiscal deficit (LTROUGHGDP_DEF_LT_OPEN) is negative and statistically significant in every region outside sub-Saharan Africa. Moreover, controlling for OPENNESS strengthens the main effect of fiscal policy (in the subsample of industrial countries the coefficient of LTROUGHGDP_DEF_LT goes from 0.12 to 0.31 and in the subsample of non-African developing countries the coefficient goes from 0.11 to 0.17). However, controlling for the interaction between fiscal policy and openness does not explain the puzzle of the sluggish recovery of open economies. In fact, the LTROUGHOPENNESS interaction is now even larger in absolute value than in Table 16.

Capital account openness has a limited impact on recovery. Using an index of capital account openness, we find that industrial countries with more open capital accounts experience slightly slower growth, but the effect is only marginally significant. In the case of developing countries the coefficient is often positive but never statistically significant (Table 21). More relevant for our analysis, we find that capital account openness does not have a significant effect on the speed of recovery. When we jointly control for capital account and trade openness we find that in developing countries with more open capital accounts, the negative effect of trade openness is less than in those with less open capital accounts (Table 22, column 4), but again the effect is only marginally significant.

Robustness analysis

We check the robustness of the results described above, which focus on the speed of recovery in the year immediately after the trough of a recession, to an alternative horizon of the first *and second* years after the trough.[15] In much of the analysis above, we compared the asymmetric impact of policy or country characteristics on growth in the post-trough recovery year relative to other expansion years. If policies and country characteristics impact growth in the second year after a trough similarly to their impact in normal expansion years, we anticipate that combining the first and second post-trough years will reduce the ability to detect an asymmetric response. We find the results to be robust overall; but as expected, a few previous results showing asymmetry in recovery become insignificant (although they maintain the same sign): fiscal policy in both industrial and non-SSA developing countries,

[15] Tables are not shown, but are available upon request.

foreign aid growth in Sub-Sahara Africa, exchange rate regimes in non-SSA developing countries, and the interaction of trade and capital account openness in non-SSA developing countries. This reduction in significance when including the second year thus indicates that these policy variables are most effective in the first recovery year. However, a few policies that previously had an insignificant asymmetric response in recovery become significant when combining the first two post-trough years: rigid labor market institutions in industrial countries; openness and its interaction with economic size in Sub-Saharan Africa; partner country growth in all countries and developing countries open to trade; and intermediate exchange rate regimes in industrial countries. Finally, the asymmetric impact of money growth in industrial countries becomes insignificant, but its direct impact in normal expansion years now becomes significant.

We also check the robustness of the results on the speed of recovery after a recession when controlling for the depth of the recession. The depth of the recession is measured as the percentage deviation of actual output from a log-linear trend estimated using all available observations, and thus can be considered a measure of the outputgap.[16] In Table 23, we investigate growth in the subsequent expansion as well as any asymmetric growth effects in the immediate recovery year. We find a negative relationship between the outputgap and growth in non-recovery years: for each additional percentage point in actual output relative to trend (e.g., 11 percent versus 10 percent), growth is 0.073 percentage points lower for industrial countries and 0.032 percentage points lower for developing countries. Thus, this reflects a very small reversion of output to trend. However, we also find asymmetric growth effects in the immediate recovery year. In industrial countries, a deeper recession (a more negative outputgap) is associated with lower recovery growth, whereas the recovery is slightly stronger in Sub-Saharan African countries when the recession is deeper. When controlling for the depth of the recession, we find that all prior results on country policies are robust.

IV. THE AFTERMATH OF BANKING CRISES

As a last piece of analysis, we study the speed of recovery from recessions involving banking crises relative to the speed of recovery after other recessions. Table 24 reaffirms prior results that growth is sluggish in the post-trough recovery year relative to other expansion years.[17] The table also shows that a banking crisis significantly reduces growth for industrial countries (and insignificantly for developing countries). But recovery following a recession associated with a banking crisis is particularly sluggish. For non-SSA developing countries, growth is 1¼ percentage points lower in the post-trough recovery from a banking crisis relative to recovery from other recessions. This result on sluggish recovery for banking crisis does not hold for the average Sub-Saharan African country, but it is highly significant for large Sub-Saharan African countries (result available upon request).

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[16] Our results are robust to estimating trend output with the Hodrick–Prescott filter.

[17] In Table 24, we jointly use the first and the second lag of the banking crisis dummy. Thus, the banking crisis interaction will take value one if there was a banking crisis at time t-1 or time t-2. We adopt this timing strategy because banking crises may have a long lasting effect. Moreover, using just one lag would yield very few cases in which the interaction takes a value different from zero.

Some policies affect recovery from recessions associated with banking crises relative to other recessions. Fiscal policy is particularly effective in boosting growth in industrial countries that are recovering from recessions associated with banking crises (Table 25).[18] Each percentage point of additional fiscal deficit to GDP boosts the post-trough growth rate by 0.3 percentage points above the effect of fiscal policy on recovery from other recessions. This finding is robust to measuring the deficit relative to trend GDP. We find, however, that there is no significant difference in the impact of monetary policy on recovery following banking crisis-related recessions relative to other recessions.[19] For developing countries, aid helps recover from banking crisis-related recessions (Table 26), with the impact being particularly large and significant for Sub-Saharan Africa.

Trade and capital account openness and the exchange rate regime also have asymmetric impacts on recovery from recessions associated with banking crises relative to recovery from other recessions. For industrial countries, trade and capital account openness individually and jointly help recover from banking crises (Table 27). Floating regimes, which significantly improve an industrial country's recovery from most recessions, have significantly less impact on recovery from a banking crises (Table 28), but floating regimes are particularly useful for developing countries in recovering from banking crises.

V. CONCLUSIONS

We document significant differences in the speed at which countries recover from recessions. We show that the differences in recovery growth rates reflect macroeconomic and structural policy differences. In particular, we find asymmetries in the growth response to policies in the year of recovery from recession relative to other years of economic expansion. Fiscal and monetary stimulus and foreign aid can be more effective to boost a rebound from recession relative to the effect of these policies on growth in other stages of the business cycle. Real appreciation, fixed and intermediate exchange rate regimes, and trade openness are associated with lackluster recoveries.

Of particular note, we find that fiscal policy is less effective in lifting recovery growth in more open economies. In open economies, fiscal stimulus may spill over to higher growth in partner countries by increasing demand for imported foreign goods and services. This finding suggests the need for more coordination in fiscal stimulus across countries, so that the spillover to other countries is offset by equivalent increases in foreign demand for domestic goods and services.

We also investigate whether recovery from banking crises is different from other recoveries and find strong evidence in this direction. Banking crisis-related recoveries are more sluggish than other recoveries. However, some policies may be more effective for these situations. Fiscal policy, foreign aid, trade and capital account openness, and the exchange

[18] Note that Tables 25-28 do not include the main effect of the banking crisis dummy because there are few episodes of banking crisis in normal times (i.e. in year with positive growth which are not immediately following a recession) and thus the main effect of this variable tend to yield unstable estimates when entered together with several other interacted variables.

[19] The latter results are available upon request.

rate regime have disparate impacts on recovery from banking crises relative to other recessions.

The stylized facts described in this paper open several interesting avenues for further research. Two of these avenues that we find particularly promising are the relationship between openness to trade and capital flows, and the asymmetric effectiveness of macroeconomic policies and the exchange rate regime on economic growth in different stages of the business cycle.

Table 1: Speed of Recovery after Recessions (FE regressions)

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.441**	-1.042***	-0.362*	-0.747***	0.286
	(0.19)	(0.27)	(0.21)	(0.26)	(0.36)
Constant	5.400***	3.911***	5.701***	5.827***	5.394***
	(0.023)	(0.020)	(0.027)	(0.029)	(0.062)
Observations	5482	925	4557	3206	1351
Number of id	197	23	174	128	46
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2: Speed of Recovery (countries with population less than 1 million are excluded from the sample)

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.341	-0.857***	-0.265	-0.710**	0.289
	(0.21)	(0.26)	(0.24)	(0.31)	(0.37)
Constant	5.373***	3.803***	5.732***	5.891***	5.416***
	(0.025)	(0.019)	(0.030)	(0.032)	(0.066)
Observations	4531	845	3686	2428	1258
Number of id	155	21	134	92	42
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Speed of Recovery and Country Size

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.471**	-0.847***	-0.389	-0.759**	0.189
	(0.21)	(0.25)	(0.25)	(0.32)	(0.41)
LTROUGH*LSIZE	-0.133	0.155	-0.153	0.0746	-0.104
	(0.083)	(0.14)	(0.13)	(0.18)	(0.46)
Constant	5.363***	3.803***	5.727***	5.886***	5.421***
	(0.025)	(0.019)	(0.030)	(0.032)	(0.064)
Observations	4464	845	3619	2377	1242
Number of id	150	21	129	88	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

LSIZE is the log of total GDP (in constant US dollar averaged over 1970-2000)
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Speed of Recovery and Monetary Policy

	(1)	(2)	(3)	(4)
LTROUGH	-1.003**	-0.714**	-1.234*	-1.192*
	(0.41)	(0.32)	(0.64)	(0.66)
LTROUGH*MONEYGR	-0.000421	0.128**	-0.0265	-0.0277
	(0.037)	(0.061)	(0.044)	(0.045)
MONEYGR	0.0550***	0.0353	0.0595***	0.0598***
	(0.016)	(0.022)	(0.019)	(0.020)
Constant	4.120***	2.859***	4.897***	5.007***
	(0.091)	(0.10)	(0.13)	(0.13)
Observations	969	363	606	570
Number of id	75	21	54	50
Sample	ALL	IND	DEV	DEV NO SSA

Moneygr is the real growth rate of broad money (most countries define broad money as M2). Because of lack of data, we do not report separate estimation for SSA.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Speed of Recovery and Fiscal Policy

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.716***	-0.596*	-0.745**	-1.390***	0.685
	(0.26)	(0.34)	(0.31)	(0.32)	(0.64)
LTROUGH*GDP_DEF	0.0636	0.117**	0.0495	0.114**	-0.119
	(0.041)	(0.055)	(0.048)	(0.053)	(0.11)
GDP_DEF	-0.0107	-0.0914	0.00900	-0.0361	0.0861**
	(0.027)	(0.054)	(0.029)	(0.039)	(0.035)
Constant	5.145***	3.759***	5.580***	5.826***	5.049***
	(0.084)	(0.18)	(0.089)	(0.11)	(0.12)
Observations	2434	557	1877	1305	572
Number of id	127	21	106	70	36
Sample	ALL	IND	DEV	DEV NO SSA	SSA

GDP_DEF is the lagged fiscal deficit over GDP.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Speed of Recovery and Fiscal Policy (alternative definition)

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.742***	-0.595*	-0.778**	-1.380***	0.537
	(0.25)	(0.33)	(0.31)	(0.33)	(0.61)
LTROUGH*GDP_DEF_LT	0.0607	0.118*	0.0467	0.107**	-0.104
	(0.041)	(0.058)	(0.047)	(0.051)	(0.10)
GDP_DEF_LT	-0.0165	-0.0911	0.000490	-0.0427	0.0729**
	(0.025)	(0.053)	(0.026)	(0.035)	(0.030)
Constant	5.146***	3.767***	5.588***	5.831***	5.080***
	(0.080)	(0.18)	(0.084)	(0.10)	(0.11)
Observations	2407	557	1850	1280	570
Number of id	125	21	104	69	35
Sample	ALL	IND	DEV	DEV NO SSA	SSA

GDP_DEF_LT is the lagged fiscal deficit over trend GDP.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Speed of Recovery and Foreign Aid

	(3)	(4)	(5)
LTROUGH	-0.573	-1.301***	0.420
	(0.41)	(0.48)	(0.66)
LTROUGH*AID_GR	0.02514*	0.01303	0.04896**
	(1.32)	(1.55)	(2.11)
AID_GR	0.00408	0.00275	0.00698
	(0.35)	(0.43)	(0.60)
Constant	5.299***	5.607***	4.817***
	(0.039)	(0.044)	(0.068)
Observations	1076	653	423
Number of id	116	75	41
Sample	DEV	DEV NO SSA	SSA

Aidgr measures the growth rate of aid flows (in USD)
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Speed of Recovery and Exchange Rate Regime

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.593**	-0.466*	-0.626**	-1.355***	0.113
	(0.23)	(0.26)	(0.27)	(0.29)	(0.45)
LTROUGH*FLOATING	0.627	1.204*	0.514	1.414**	0.412
	(0.40)	(0.60)	(0.48)	(0.61)	(0.93)
FLOATING	-0.292	0.105	-0.358*	-0.406	-0.372
	(0.18)	(0.30)	(0.21)	(0.25)	(0.34)
Constant	5.155***	3.096***	5.625***	5.779***	5.394***
	(0.073)	(0.15)	(0.078)	(0.11)	(0.11)
Observations	2478	479	1999	1245	754
Number of id	142	21	121	80	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Floating is a dummy that takes value one for countries with floating and dirty-floating exchange rate regimes, and the excluded dummy includes fixed and pegged (including crawling) exchange rate regimes.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Speed of Recovery and Exchange Rate Regime

	(1)	(2)	(3)	(4)	(5)
LTROUGH	0.198	0.313	0.144	-0.145	1.614
	(0.35)	(0.41)	(0.46)	(0.45)	(1.45)
INTERM	0.185	-0.0707	0.233	0.400	-0.367
	(0.20)	(0.37)	(0.23)	(0.26)	(0.43)
FIX	0.544**	-0.109	0.666**	0.782**	0.462
	(0.23)	(0.36)	(0.27)	(0.33)	(0.47)
LTROUGH*INTERM	-1.602***	-0.831	-1.590**	-1.707**	-1.968
	(0.55)	(0.62)	(0.63)	(0.71)	(1.58)
LTROUGH*FIX	-0.785*	-1.529**	-0.672	-1.322**	-1.621
	(0.42)	(0.58)	(0.51)	(0.57)	(1.41)
Constant	4.748***	3.219***	5.116***	5.185***	5.061***
	(0.14)	(0.20)	(0.17)	(0.18)	(0.39)
Observations	2551	490	2061	1281	780
Number of id	144	21	123	82	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Interm and fix are dummies that take values one for intermediate and fixed exchange rate regimes (source Levy Yeyati and Sturzenegger), and the excluded dummy is floating.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Speed of Recovery, Exchange Rate Regime, and Currency Crises

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.848***	-0.971**	-0.838***	-2.102***	0.136
	(0.27)	(0.40)	(0.30)	(0.43)	(0.44)
LTROUGH*FLOATING	0.598	1.312**	0.473	1.327**	0.554
	(0.40)	(0.59)	(0.47)	(0.59)	(0.85)
FLOATING	-0.309	0.146	-0.393*	-0.552*	-0.103
	(0.20)	(0.31)	(0.23)	(0.28)	(0.40)
LTROUGH*CURRENCY CRISIS	0.289	-0.564	0.340	1.139**	-0.282
	(0.24)	(0.95)	(0.28)	(0.55)	(0.40)
CURRENCY CRISIS	-0.291	-0.128	-0.342	-0.800**	0.280
	(0.24)	(0.20)	(0.28)	(0.39)	(0.40)
CURRENCY CRISIS*FLOATING	0.110	-0.0659	0.190	0.762*	-1.074*
	(0.30)	(0.46)	(0.35)	(0.45)	(0.58)
Constant	5.204***	3.096***	5.687***	5.909***	5.329***
	(0.089)	(0.15)	(0.099)	(0.13)	(0.14)
Observations	2478	479	1999	1245	754
Number of id	142	21	121	80	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Floating is defined as in Table 8. Currency crisis is a dummy that takes value 1 in years in which the country suffered a currency crisis.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11: Speed of Recovery, Exchange Rate Regime, and Currency Crises

	(1)	(2)	(3)	(4)	(5)
LTROUGH	0.177	0.526	0.105	-0.322	2.291*
	(0.36)	(0.43)	(0.47)	(0.46)	(1.34)
INTERM	0.232	-0.0346	0.273	0	-0.602
	(0.22)	(0.37)	(0.26)	(0.29)	(0.47)
FIX	0.504*	-0.173	0.631**	0.836**	0.116
	(0.26)	(0.36)	(0.29)	(0.37)	(0.52)
LTROUGH*INTERM	-1.595***	-1.088*	-1.598**	-1.790**	-2.581*
	(0.54)	(0.54)	(0.62)	(0.72)	(1.51)
LTROUGH*FIX	-0.772*	-1.651***	-0.651	-1.283**	-2.202*
	(0.42)	(0.56)	(0.51)	(0.56)	(1.26)
LTROUGH*CURRENCY CRISIS	0.134	-0.770	0.200	0.936	-0.271
	(0.27)	(0.93)	(0.32)	(0.56)	(0.43)
CURRENCY CRISIS	-0.270	-0.120	-0.312	-0.176	-1.435**
	(0.22)	(0.39)	(0.27)	(0.32)	(0.60)
CURRENCY CRISIS*INTERM	-0.190	-1.123*	-0.0990	-0.344	1.365*
	(0.32)	(0.60)	(0.36)	(0.41)	(0.69)
CURRENCY CRISIS*FIX	0.134	0.190	0.110	-0.386	1.704**
	(0.31)	(0.43)	(0.37)	(0.60)	(0.67)
Constant	4.804***	3.258***	5.179***	5.207***	5.346***
	(0.16)	(0.20)	(0.19)	(0.20)	(0.43)
Observations	2551	490	2061	1281	780
Number of id	144	21	123	82	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Intermediate and fix are defined as in Table 9. Currency crisis is defined in Table 10.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12: Speed of Recovery and the Real Exchange Rate

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.402*	-0.899***	-0.308	-0.819**	0.270
	(0.22)	(0.32)	(0.25)	(0.32)	(0.39)
LTROUGH*DRER	-2.930**	-0.193	-3.156**	-1.147	-4.103**
	(1.38)	(3.83)	(1.42)	(1.77)	(1.74)
DRER	1.624***	0.233	1.787***	1.773*	1.709**
	(0.53)	(0.56)	(0.60)	(0.98)	(0.68)
Constant	5.324***	3.837***	5.717***	5.865***	5.432***
	(0.027)	(0.022)	(0.034)	(0.035)	(0.075)
Observations	3997	825	3172	2060	1112
Number of id	148	21	127	86	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Drer_pwt is the percentage change of the bilateral real exchange rate (vis a vis USD, source PWT). An increase of the index is an appreciation and a decrease is a depreciation.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 13: Speed of Recovery, the Real Exchange Rate, and Currency Crises

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.421*	-0.945***	-0.330	-0.790**	0.288
	(0.22)	(0.33)	(0.25)	(0.36)	(0.40)
LTROUGH*DRER	-2.887**	-2.029	-3.095**	-1.177	-4.181**
	(1.37)	(4.18)	(1.42)	(1.81)	(1.64)
DRER	1.390**	-1.133*	1.687**	2.033*	1.343*
	(0.59)	(0.61)	(0.67)	(1.13)	(0.76)
LTROUGH*CURRENCY CRISIS	0.152	0.181	0.165	-0.126	-0.0227
	(0.14)	(0.76)	(0.17)	(0.64)	(0.31)
CURRENCY CRISIS	-0.150	0.142	-0.167	-0.253	0.00176
	(0.14)	(0.36)	(0.17)	(0.19)	(0.30)
CURRENCY CRISIS*DRER	0.763	8.215***	0.201	-1.292	1.671
	(1.05)	(2.87)	(1.12)	(1.55)	(1.60)
Constant	5.356***	3.905***	5.748***	5.900***	5.443***
	(0.037)	(0.048)	(0.046)	(0.052)	(0.094)
Observations	3997	825	3172	2060	1112
Number of id	148	21	127	86	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Drer_pwt is defined as in Table 12, currency crisis is defined as in Table 10.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 14: Speed of Recovery and Labor Market Rigidities

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.406*	-0.879***	-0.345	-0.682**	0.233
	(0.21)	(0.26)	(0.24)	(0.30)	(0.41)
LTROUGH*ROE	0.0160	-0.00931	0.0183	0.0292	-0.00949
	(0.011)	(0.012)	(0.013)	(0.018)	(0.024)
Constant	5.344***	3.803***	5.709***	5.857***	5.422***
	(0.024)	(0.019)	(0.030)	(0.031)	(0.065)
Observations	4404	845	3559	2340	1219
Number of id	146	21	125	85	40
Sample	ALL	IND	DEV	DEV NO SSA	SSA

ROE is a (time-invariant) index of employment rigidity assembled by the World Bank.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 15: Speed of Recovery and Effective Labor Market Rigidities

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.443**	-0.883***	-0.337	-0.667**	0.203
	(0.20)	(0.26)	(0.24)	(0.31)	(0.37)
LTROUGH*EROE	-0.00845*	-0.00667	-0.00886	-0.0136	0.00151
	(0.0043)	(0.0083)	(0.0064)	(0.011)	(0.0082)
Constant	5.343***	3.803***	5.709***	5.858***	5.422***
	(0.025)	(0.019)	(0.031)	(0.031)	(0.066)
Observations	4395	845	3550	2331	1219
Number of id	145	21	124	84	40
Sample	ALL	IND	DEV	DEV NO SSA	SSA

EROE is a (time-invariant) index of employment rigidity assembled by the World Bank multiplied by average rule of law.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 16: Speed of Recovery and Trade Openness

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.406**	-0.853***	-0.359	-0.770***	0.202
	(0.20)	(0.26)	(0.23)	(0.29)	(0.36)
LTROUGH*OPEN	-0.0155***	0.00422	-0.0168***	-0.0156***	-0.0159
	(0.0041)	(0.0083)	(0.0047)	(0.0052)	(0.0099)
Constant	5.369***	3.803***	5.727***	5.886***	5.415***
	(0.024)	(0.019)	(0.029)	(0.030)	(0.066)
Observations	4526	845	3681	2423	1258
Number of id	152	21	131	89	42
Sample	ALL	IND	DEV	DEV NO SSA	SSA

OPEN is trade over GDP (computed as (X+M)/Y) averaged over the 1970-2000 period
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 17: Speed of Recovery, Trade Openness, and Country Size

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.509**	-0.918***	-0.481**	-0.697**	-0.106
	(0.21)	(0.29)	(0.24)	(0.30)	(0.39)
LTROUGH*LSIZE	-0.130	0.178	-0.140	0.0758	-0.342
	(0.084)	(0.18)	(0.13)	(0.16)	(0.44)
LTROUGH*OPEN	-0.0162***	0.0109	-0.0188***	-0.0183***	-0.0268**
	(0.0038)	(0.0071)	(0.0042)	(0.0042)	(0.013)
LTROUGH*OPEN*LSIZE	0.00329	-0.00456	0.00364	0.00880**	-0.0174
	(0.0021)	(0.0055)	(0.0025)	(0.0039)	(0.011)
Constant	5.358***	3.803***	5.722***	5.880***	5.420***
	(0.024)	(0.018)	(0.029)	(0.029)	(0.062)
Observations	4460	845	3615	2373	1242
Number of id	148	21	127	86	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

LSIZE and OPEN are defined as in Tables 3 and 16
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 18: Speed of Recovery, Trade Openness, and Real External Shocks

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.368*	-0.796**	-0.305	-0.597*	0.0698
	(0.22)	(0.35)	(0.24)	(0.30)	(0.38)
LTROUGH*RSHOCK	0.145*	-0.264	0.165**	0.165*	0.143
	(0.76)	(0.25)	(0.79)	(0.99)	(0.15)
LTROUGH*OPEN	-0.0180***	0.000254	-0.0197***	-0.0224***	-0.0123
	(0.0054)	(0.0090)	(0.0057)	(0.0063)	(0.012)
RSHOCK	0.169***	0.514***	0.149***	0.148**	0.149
	(0.495)	(0.139)	(0.504)	(0.559)	(0.104)
LTROUGH*OPEN*RSHOCK	0.000851	-0.00353	0.00114	0.00114	0.000342
	(0.0015)	(0.0066)	(0.0015)	(0.0016)	(0.0043)
Constant	4.328***	1.620***	4.694***	4.735***	4.626***
	(0.17)	(0.42)	(0.17)	(0.19)	(0.35)
Observations	2385	359	2026	1267	759
Number of id	109	14	95	60	35
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Rshock is a real external shock measure as GDP growth of trading partners weighted by export shares. OPEN is defined as in Table 16. Columns (1) and (2) exclude the G7 countries.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 19: Speed of Recovery Trade Openness and Depth of Recession

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.673***	-0.834***	-0.675***	-0.930***	-0.215
	(0.195)	(0.257)	(0.223)	(0.290)	(0.346)
LTROUGH*OPEN	-0.0156***	0.00474	-0.0167***	-0.0153***	-0.0121
	(0.00415)	(0.00828)	(0.00472)	(0.00514)	(0.0104)
LDEPTH	-0.03523***	-0.07283***	-0.03154***	-0.02847**	-0.03762***
	(0.00855)	(0.00841)	(0.00902)	(0.01197)	(0.01206)
LTROUGH*LDEPTH	-0.01531	0.1065***	-0.01978	0.00723	-0.04709**
	(0.01404)	(0.03324)	(0.01455)	(0.01944)	(0.02139)
Constant	5.343***	3.792***	5.707***	5.866***	5.400***
	(0.0242)	(0.0190)	(0.0297)	(0.0323)	(0.0622)
Observations	4446	845	3601	2362	1239
Number of id	147	21	126	85	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Ldepth is the lag of the percentage deviation of actual output from log-linear trend output.
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 20: Speed of Recovery, Trade Openness and Fiscal Policy (alternative definition)

	(1)	(2)	(3)	(4)	(5)
LTROUGH	6.321*	15.81**	5.683	11.22**	-34.83
	(3.60)	(7.00)	(4.36)	(5.30)	(23.4)
GDP_DEF_LT	-0.0221	0.0434	-0.00522	-0.0480	0.00943
	(0.033)	(0.10)	(0.038)	(0.051)	(0.10)
LTROUGH*GDP_DEF_LT	0.0942*	0.312**	0.0790	0.167**	-0.571
	(0.056)	(0.14)	(0.065)	(0.076)	(0.38)
LTROUGH*OPEN	-0.0637**	-0.180	-0.0733**	-0.103***	0.500
	(0.025)	(0.13)	(0.028)	(0.033)	(0.36)
GDP_DEF_LT*OPEN	0.0000885	-0.00222	0.0000917	0.0000905	0.000686
	(0.00020)	(0.0016)	(0.00023)	(0.00020)	(0.0012)
LTROUGH*GDP_DEF_LT*OPEN	-0.000724**	-0.00354	-0.000808**	-0.00123***	0.00816
	(0.00035)	(0.0025)	(0.00037)	(0.00041)	(0.0058)
Constant	5.527***	-3.331	6.015***	6.269***	8.082
	(0.89)	(4.99)	(1.10)	(1.06)	(5.38)
Observations	2407	557	1850	1280	570
Number of id	125	21	104	69	35
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 21: Speed of Recovery and Capital Account Openness

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.240	-0.523*	-0.176	-0.671*	0.402
	(0.22)	(0.30)	(0.26)	(0.37)	(0.37)
LTROUGH*KAOPEN	-0.124	-0.110	-0.119	-0.0119	0.0271
	(0.14)	(0.17)	(0.19)	(0.24)	(0.33)
KAOPEN	-0.0276	-0.258*	0.0604	0.0417	0.0532
	(0.085)	(0.14)	(0.11)	(0.12)	(0.19)
Constant	5.174***	3.735***	5.608***	5.783***	5.282***
	(0.029)	(0.20)	(0.038)	(0.037)	(0.15)
Observations	3369	643	2726	1748	978
Number of id	148	21	127	85	42
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Kaopen is an index of capital account openness (the higher the value the more open the capital account)
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 22: Speed of Recovery, Capital Account Openness, and Trade Openness

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.320	-0.505	-0.267	-0.965***	0.465
	(0.22)	(0.31)	(0.27)	(0.35)	(0.40)
LTROUGH*KAOPEN	-0.00412	-0.0706	0.0885	0.307	0.365
	(0.14)	(0.16)	(0.20)	(0.24)	(0.41)
LTROUGH*OPEN	-0.0160***	0.00131	-0.0175**	-0.0260***	-0.0123
	(0.0059)	(0.0082)	(0.0069)	(0.0079)	(0.012)
KAOPEN	-0.0405	-0.884**	0.121	0.114	-0.110
	(0.12)	(0.37)	(0.13)	(0.15)	(0.53)
LTROUGH*OPEN*KAOPEN	0.00219	0.00408	0.00163	0.00582*	-0.0175
	(0.0027)	(0.0081)	(0.0027)	(0.0034)	(0.013)
OPEN*KAOPEN	0.0000790	0.0110	-0.00105	-0.00117	0.00179
	(0.0013)	(0.0067)	(0.0011)	(0.0011)	(0.0067)
Constant	5.176***	4.598***	5.653***	5.828***	5.156***
	(0.033)	(0.51)	(0.061)	(0.049)	(0.42)
Observations	3366	643	2723	1745	978
Number of id	147	21	126	84	42
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 23: Speed of Recovery after Recession Controlling for Depth of Recession

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.599***	-0.838***	-0.570**	-0.850***	-0.153
	(0.199)	(0.258)	(0.228)	(0.304)	(0.354)
LDEPTH	-0.03535***	-0.07283***	-0.03166***	-0.02848**	-0.03785***
	(0.00855)	(0.00840)	(0.00903)	(0.01197)	(0.01196)
LTROUGH*LDEPTH	-0.01305	0.1057***	-0.01773	0.1092	-0.04743**
	(0.01421)	(0.03349)	(0.01471)	(0.01947)	(0.02201)
Constant	5.347***	3.792***	5.712***	5.871***	5.401***
	(0.0249)	(0.0190)	(0.0307)	(0.0341)	(0.0621)
Observations	4450	845	3605	2366	1239
Number of id	149	21	128	87	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Ldepth is the lag of the percentage deviation of actual output from log-linear trend output.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 24: Speed of Recovery after Normal Recessions and after Banking Crises

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.251	-0.833***	-0.145	-0.518	0.304
	(0.25)	(0.27)	(0.28)	(0.36)	(0.45)
LTROUGH*BANK_CRISIS	-0.603	-0.449	-0.652*	-1.261***	0.275
	(0.37)	(0.75)	(0.39)	(0.40)	(0.69)
BANK_CRISIS	-0.526**	-1.808***	-0.351	-0.378	-0.307
	(0.25)	(0.58)	(0.27)	(0.30)	(0.51)
Constant	5.417***	3.885***	5.764***	5.922***	5.450***
	(0.035)	(0.035)	(0.041)	(0.046)	(0.084)
Observations	4531	845	3686	2428	1258
Number of id	155	21	134	92	42
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Bank crisis is a dummy that takes value 1 in years in which the country suffered a banking crisis.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 25: Speed of Recovery after Normal Recessions and after Banking Crises. The Effect of Fiscal Policy

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.542*	-0.512	-0.545	-1.235***	0.822
	(0.31)	(0.35)	(0.39)	(0.41)	(0.77)
LTROUGHGDP_DEF	0.0517	0.100	0.0391	0.101*	-0.111
	(0.049)	(0.062)	(0.058)	(0.058)	(0.12)
GDP_DEF	-0.0105	-0.0914	0.00922	-0.0359	0.0868**
	(0.028)	(0.055)	(0.029)	(0.039)	(0.035)
LTROUGH*BANK_CRISIS	-1.371**	-2.037***	-1.352**	-1.799***	0.302
	(0.54)	(0.20)	(0.57)	(0.46)	(1.82)
LTROUGH*BANK_CRISIS* GDP_DEF	0.100	0.302***	0.0774	0.143	-0.305
	(0.080)	(0.063)	(0.085)	(0.092)	(0.27)
Constant	5.145***	3.758***	5.579***	5.826***	5.048***
	(0.084)	(0.18)	(0.089)	(0.11)	(0.12)
Observations	2434	557	1877	1305	572
Number of id	127	21	106	70	36
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 26: Speed of Recovery after Normal Recessions and after Banking Crises. The Effect of Foreign Aid

	(1)	(2)	(3)
LTROUGH	-0.395	-1.228*	0.799
	(0.58)	(0.68)	(0.93)
LTROUGH*AIDGR	1.691	0.978	2.960
	(1.78)	(2.19)	(2.76)
AID_GR	0.405	0.274	0.706
	(0.35)	(0.43)	(0.60)
LTROUGH*BANK_CRISIS	-0.789	-1.389**	-0.0832
	(0.58)	(0.63)	(0.88)
LTROUGH*BANK_CRISIS*AID_GR	3.651*	1.607	10.73**
	(2.18)	(2.40)	(4.76)
Constant	5.298***	5.607***	4.818***
	(0.040)	(0.044)	(0.066)
Observations	1076	653	423
Number of id	116	75	41
Sample	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 27: Speed of Recovery after Normal Recessions and after Banking Crises. The Effect of Capital Account and Trade Openness

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.191	-0.455	-0.0990	-0.740*	0.612
	(0.26)	(0.34)	(0.32)	(0.42)	(0.48)
LTROUGH*KAOPEN	-0.0109	-0.130	0.138	0.325	0.578
	(0.15)	(0.17)	(0.22)	(0.27)	(0.53)
LTROUGH*OPEN	-0.0169***	-0.000599	-0.0185**	-0.0270***	-0.0135
	(0.0062)	(0.0092)	(0.0072)	(0.0081)	(0.014)
KAOPEN	-0.0356	-0.258*	0.0427	0.0258	0.0252
	(0.086)	(0.15)	(0.11)	(0.13)	(0.19)
LTROUGH*OPEN*KAOPEN	0.00230	0.0108	0.00116	0.00533	-0.0245
	(0.0026)	(0.0084)	(0.0027)	(0.0033)	(0.016)
LTROUGH*BANK_CRISIS	-0.825**	-0.717***	-0.796*	-1.651***	0.0920
	(0.42)	(0.039)	(0.45)	(0.40)	(0.68)
LTROUGH*BANK_CRISIS*OPEN	-0.0424	1.317***	-0.0867	0.264	0.0700
	(0.33)	(0.11)	(0.38)	(0.42)	(0.85)
LTROUGH*BANK_CRISIS*KAOPEN	-0.00988	0.0159***	-0.0108	-0.0221	-0.00559
	(0.014)	(0.0010)	(0.016)	(0.015)	(0.029)
LTROUGH*BANK_CRISIS*OPEN*KAOPEN	0.00353	0.0181***	0.00418	0.00866	0.0359
	(0.0085)	(0.0012)	(0.0093)	(0.0098)	(0.045)
Constant	5.177***	3.735***	5.606***	5.788***	5.262***
	(0.029)	(0.20)	(0.039)	(0.035)	(0.15)
Observations	3366	643	2723	1745	978
Number of id	147	21	126	84	42
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 28: Speed of Recovery after Normal Recessions and after Banking Crises. The Effect of the Exchange Rate Regime

	(1)	(2)	(3)	(4)	(5)
LTROUGH	-0.535*	-0.443	-0.565*	-1.306***	0.138
	(0.27)	(0.28)	(0.32)	(0.33)	(0.54)
LTROUGH*FLOATING	0.237	1.398**	-0.0542	0.922	-0.369
	(0.47)	(0.65)	(0.56)	(0.65)	(1.05)
FLOATING	-0.288	0.0955	-0.351*	-0.407	-0.380
	(0.18)	(0.30)	(0.21)	(0.25)	(0.34)
LTROUGH*BANK_CRISIS	-0.718*	-0.357	-0.752*	-1.434***	0.381
	(0.38)	(0.30)	(0.39)	(0.37)	(0.73)
LTROUGH*BANK_CRISIS*FLOATING	1.804**	-1.134*	1.996**	2.457***	4.420*
	(0.76)	(0.65)	(0.82)	(0.78)	(2.48)
Constant	5.154***	3.100***	5.623***	5.779***	5.395***
	(0.073)	(0.14)	(0.079)	(0.11)	(0.11)
Observations	2478	479	1999	1245	754
Number of id	142	21	121	80	41
Sample	ALL	IND	DEV	DEV NO SSA	SSA

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix: Data sources

LTROUGH	Dummy variable taking value 1 in the first year of a recovery. Source: authors' calculations based on World Bank's World Development Indicators (WDI)
GROWTH	Growth rate of real GDP per capita. Source: WDI
LSIZE	Log of average total GDP in constant USD. Source: WDI
MONEYGR	Percent change in broad money. Source: EIU
GDP_DEF	Government Budget Deficit to GDP. Source WDI and national sources
GDP_DEF_LT	Government budget deficit to trend GDP. Source: author calculations based on WDI and national sources
ROE	Rigidity of employment index (0=less rigid to 100=more rigid): Source: WDI
RULE of LAW	Index of rule of law (higher value indicates better governance outcomes). Source: Kaufman et al. (2008)
EROE	ROE*RULE of LAW
OPEN	Trade openness, measured as (X+M)/GDP. Source: WDI
RSHOCK	GDP growth of trading partners weighted by export shares. This is the Jaimovich and Panizza (2007) real external shock measure divided by total exports over GDP.
KAOPEN	Index that measures the extent of openness in capital account transactions. Source: Chinn and Ito (2008)
AID_GR	Growth rate of net aid flows. Source: authors' calculation based on OECD DAC data.
FLOATING	Dummy variable that takes value one if the Levy Yeyati Sturzenegger (2005) 5-way classification indicates a float or a dirty float and zero if the classification indicates a crawling peg or a fixed exchange rate regime. Country-years classified as inconclusive are dropped form the sample.
CURRENCY CRISIS	Dummy variable that takes value one if in a given year there was a currency crisis.
BANKING CRISIS	Dummy variable that takes value one if in a given year there was a banking crisis. Source: Caprio and Klingebiel (2003) and Laeven and Valencia (2008)
FIX	Dummy variable that takes value 1 if the Levy Yeyati Sturzenegger (2005) 3-way classification indicates a fixed exchange rate regime.
INTERM	Dummy variable that takes value 1 if the Levy Yeyati Sturzenegger (2005) 3-way classification indicates an intermediate exchange rate regime.

DRER	Percentage change in the real exchange rate (and positive value indicates an appreciation). Source: authors' calculation bases on PWT data.
LDEPTH	Lagged recession depth computed as the lag of the percentage deviation of actual output from log-linear trend output.

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