

Or, changed prospects after a crisis might reflect the correction of outsized expectations that fed the prior boom. If, for instance, investors grossly overestimated the possibilities for productivity improvement from a new technology, they might bid up asset prices, borrow against future anticipated income, and invest in myriad capital projects in an unsustainable manner. Chancellor (2000) casts many episodes of financial euphoria and ensuing crash over the centuries in exactly this sequence, from the diving bell, through the steam engine, to the radio, and thereafter. Spending advances rapidly on hope, and, on reality, contracts, and then recovers only slowly. Recent discussions about the “new normal” in reference to the post-crisis landscape leave the impression that the pre-crisis environment *was* “normal.” In fact, there are reasons to believe that the pre-crisis decade set a high-water mark distorted by a variety of forces. We have presented evidence here that many of those patterns are reversed not only in the immediate vicinity of the crisis, (as Reinhart and Rogoff, 2009 show), but also over longer horizons that span several years.²⁴

For whatever the initiating change, the real interest rate consistent with full employment of resources presumably falls as a consequence of slower economic growth. The logic is that households need less inducement to defer consumption when future consumption prospects are bleaker. In addition to the fall-out of a lower real interest rate on asset prices, monetary policy makers need to reconsider the benefits of an inflation buffer to protect from the zero lower bound to nominal interest rates. If real GDP growth has permanently tilted down as a consequence of a severe economic dislocation, or at least has done so in a time frame measured by decades, fiscal authorities face lower

²⁴ This also fits the pattern of adjustment after an inflow of foreign capital, or what Reinhart and Reinhart (2008) refer to as a “capital flow bonanza.”

prospects for revenue and higher pressure on outlays. Similarly, the apportioning of the current budget stance into its cyclical and structural components will shift with changes in the level and rate of growth of potential output.

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Appendix: Data and Methodology

Unless otherwise noted, the pre- and post-crises decades (which forms a 21-year window centered on the crisis year) in our analysis are those defined in Table 1. Any departure from this coverage owes to lack of data and is noted accordingly.

Statistical analysis

The first benchmark exercise is to pool the data across countries into two groups, the pre-crisis decade (t-10 to t-1) and the post crisis period (t+1 to t+10). The probability distributions (marginal and cumulative) are tabulated enabling simple comparisons for per capita GDP growth, unemployment and inflation through standard statistical tests, such as the Kolmogorov-Smirnoff (K-S) for the pre-and post-crisis decades. The null hypothesis of the K-S test is that the observations for the two sub-periods are drawn from a common population.

The second type of exercise, applied to the level of real per capita GDP and real housing prices examines the marginal and cumulative probability distribution of these time series during (t+1 to t+10) relative to the benchmark level at the time of (T) or just prior (t-1) to the crisis. These calculations are informative on two grounds: first, it provides a glimpse into the duration of the shock, if there is a high share of observations below the initial level; second, it is also informative as to the magnitude of the initial decline or collapse in the series, as the 1929 and 1973 comparisons discussed in the following section make plain.

Third, to examine the cycle in credit, external debt, and real housing prices, we calculate on a country-by-country and (importantly) series-by-series basis the peak-to-trough calculations, as in Reinhart and Rogoff (2009). The calculations facilitate an

assessment the amplitude and duration of upswings and downturns in the cycle of the indicator in question. The dating of these cycle turning points also facilitates comparisons across markets and indicators, as even when we have a well-grounded dating system for recessions and recoveries (for example that of the National Bureau of Economic Research for the United States) synchronicity in cycles across sectors and indicators is not the norm.

This approach to the comparisons of the pre and post-crisis landscape is not without limitations. A pure before- and after-crisis comparison with a ten-year window is bound to be clouded by other important events that influence economic outcomes in such a long horizon before or after the crisis. At the individual country analysis comparable issues arise. For the five advanced economy episodes and the five Asian crisis episodes it is reasonable to state that the pre-crisis decade was one of relative “economic tranquility” and even prosperity. For the four Latin American and the Turkish crises listed in Table 1 a comparable statement cannot be made. Chile was mired in economic and political turmoil in the mid-1970s (the half point in the t-10 to t-1 window), while Argentina, Mexico and Turkey grappled with high (three-digit) inflation rates in the decade prior to the respective crises studied here. The 1919-1928 window prior to the 1928 crash captures the immediate aftermath of war while the tail end of the 1930-1939 episode capture the preparation for the next war.²⁵ The post-1973 oil shock sample includes another major subsequent shock.

²⁵ This is most evident in the GDP and particularly unemployment data for Germany and Japan.

Even a twenty-one-year window may not fully cover the very long debt and credit cycles.²⁶ The build-up in debt in Japan (among others) prior to the onset of the banking crisis in 1992 pre dates the ten-year window beginning. The post-crisis deleveraging (domestic and external debts) in countries like Chile (1981) and Indonesia (1997) lasted past the 10-year benchmarks of 1991 and 2007, respectively.²⁷

Some crises begin early in the calendar year while others begin much later; in the later case, the year $t+1$ may also reasonably classify as a crisis year. To deal with these cases, perform sensitivity analysis that compares $(t-10$ to $t-1)$ to $(t+2$ to $t+11)$. Unless otherwise noted, these results not are appreciably different from the core exercise described above.

Data and country coverage

The primary time series we cover in our analysis are per-capita GDP levels and rates of growth, unemployment rates, inflation, real housing prices, domestic bank credit/GDP, external debt/GDP, and real housing prices. The coverage is not uniform across countries for all the episodes in question, so particulars are given for each exercise. The greatest amount of detail is provided for the fifteen individual crises episodes listed in Table 1 and for the 2007 crisis case. For the global episodes, the data covers 21 or 22 advanced economies, listed already in the Introduction, and 20 emerging markets for the Great Depression episodes and 49 emerging markets.

²⁶ See Reinhart and Rogoff (2010) , Reinhart (2010) and Schularick and Taylor (2009) for a documentation of these “long cycles.”

²⁷ Table 3 provides sufficient information to pinpoint which cycles exceeded the time-frame boundaries imposed in this study.

Appendix Table 1. Summary of Pre- and Post-Crisis Descriptive Statistics and Kolmogorov-Smirnoff Test Results

Episode and sample	Median	Minimum	Maximum	K-S Statistic	1% critical values
Pre- and post- 1929 comparisons of real per capita GDP growth					
<i>21 "Now-advanced" Economies</i>					
1919-1928	3.0	-17.5	33.9		
1930-1939	1.8	23.0	17.8	15.5	7.98
<i>20 Emerging Economies</i>					
1919-1928	2.9	-15.2	27.7		
1930-1939	0.7	-22.5	34.7	12.2	7.72
Pre- and post- 1973 oil shock comparisons of real per capita GDP growth					
<i>21 Advanced Economies</i>					
1963-1972	4.0	-6.0	11.7		
1974-1983	1.8	-7.5	6.5	37.6	7.95
<i>48 Emerging Economies</i>					
1963-1972	3.0	-18.0	27.0		
1974-1983	2.2	-37.2	14.7	14.6	5.26
Pre-(t-10 to t-1) and post-(t+1 to t+10) severe post WWII financial crisis					
<i>Advanced economies, the Big Five</i>					
Comparisons of real per capita GDP growth					
t-10 to t-1	3.1	-0.7	7.9		
t+1 to t+10	2.1	-4.3	5.9	28.0	16.3
Comparisons of the unemployment rate					
t-10 to t-1	2.7	1.1	6.1		
t+1 to t+10	7.9	2.5	21.2	68.0	16.3
<i>Five Asian crisis, 1997episodes</i>					
Comparisons of real per capita GDP growth					
t-10 to t-1	6.6	-2.8	11.7		
t+1 to t+10	3.8	-14.4	8.7	54.0	16.3
Comparisons of the unemployment rate					
t-10 to t-1	2.9	1.1	9.8		
t+1 to t+10	3.7	1.4	11.8	35.06	16.55
<i>All countries</i>					
Comparisons of real per capita GDP growth					
t-10 to t-1	3.8	-14.4	11.7		
t+1 to t+10	3.2	-15.1	8.7	18.61	9.51
Comparisons of the unemployment rate					
t-10 to t-1	3.7	1.1	18.7		
t+1 to t+10	7.8	1.4	21.3		

Sources: See Data Appendix for sources and the countries included in the 1929 and 1973 comparisons. The fifteen post-WWII crisis episodes are listed throughout the paper.

Appendix Table 2: Data Coverage

Country	Real housing prices End date	Domestic Credit End date	Gross external debt Full period	Real per capita GDP through 2010. Start date
<i>2007 crisis analysis, latest observation</i>				
Austria	2010:Q1	2010:M5	2003:Q4-2010:Q1	1918
Belgium	2009:Q4	2010:M5	2003:Q4-2010:Q1	1918
Denmark	2010:Q1	2009:M8	2003:Q1-2009:Q4	1918
Finland	2010:Q1	2010:M5	2002:Q1-2010:Q1	1918
France	2010:Q1	2010:M5	2002:Q4-2010:Q1	1918
Germany	2010:M6	2010:M5	2001:Q4-2010:Q1	1918
Greece	2010:Q1	2010:M5	2003:Q2-2010:Q1	1918
Iceland	2010:M6	2008:M8	1923-2010:Q1	1918
Ireland	2010:Q1	2010:M5	2002:Q4-2010:Q1	1921
Italy	2009:H1	2010:M5	2001:Q4-2010:Q1	1918
Japan	2010:M4	2009:M5	2003:Q1-2010:Q1	1918
Netherlands	2010:M6	2010:M5	2003:Q2-2010:Q1	1918
Norway	2010:M6	2008:M12	2003:Q4-2010:Q1	1918
Portugal	2010:Q1	2010:M5	2003:Q3-2010:Q1	1918
Spain	2010:M6	2010:M5	2002:Q4-2009:Q4	1918
Sweden	2010:Q1	2009:M8	2003:Q3-2010:Q1	1918
Switzerland	2010:Q1	2010:M4	1999:Q4-2010:Q1	1918
United Kingdom	2010:M6	2010:M5	2003:Q1-2010:Q1	1918
United States	2010:Q1	2009:Q4	2009:Q3-2010:Q1	1918
Net private debt		2010:Q1		
<i>fifteen severe financial crisis episodes availability before and after crisis dates</i>				
Argentina, 2001	1981-2007	1960-2008:12	1970-2010:Q1	1918
Chile, 1981	n.a.	1960-2009:6	1970-2010:Q1	1918
Colombia, 1998	1997:Q1-2008:Q4	1948-2009:8	1970-2010:Q1	1918
Finland, 1991	1970-2010:Q1	1948-2010:5	n.a.	1918
Indonesia, 1997	1994:Q1-2010:Q1	1969-2009:8	1970-2010:Q1	1918
Japan, 1992	1955:H1-2010:M5	1953-2009:M5	n.a.	1918
Korea, 1997	1986:M1-2010:M3	1951-2009:M9	1970-2010:Q1	1918
Malaysia, 1997	1988-2009:Q4	1959-2009:M4	1970-2010:Q1	1918
Mexico, 1994	n.a.	1948-2009:M8	1970-2010:Q1	1918
Norway, 1991	1970-2010:M6	1948-2008:M12	n.a.	1918
Philippines, 1997	1994:Q1-2010:Q1	1948-2008:M2	1970-2010:Q1	1918
Spain, 1977	1970-2010:M6	1952-2010:5	n.a.	1918
Sweden, 1991	1970-2010:Q1	1948-2009:M8	n.a.	1918
Thailand, 1997	1991:Q1-2010:Q1	1948-2009:M8	1970-2010:Q1	1950
Turkey, 2001	n.a.	1949-2009:7	1970-2010:Q1	1923

Notes: Inflation is available for all the countries listed above for the full sample covering the Great Depression through 2010.

The *advanced economy group* for the 1929 and 1973 comparisons is comprised of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States. The 2007 analysis also includes Iceland. The 20 *emerging markets* in the 1929 comparison are: Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, India, Indonesia, Korea, Malaysia, Mexico, Nicaragua, Peru, Philippines, Sri Lanka, Turkey, Uruguay, and Venezuela. In addition to these, the subsequent comparisons include another 28 emerging markets that make up the Reinhart and Rogoff (2009) sample.