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The Determinants of Economic Growth after the Global Financial Crisis in OECD Countries

Long-horizon projection models assume stable growth-determinant relationships, but the 2008 crisis, the strongest post-war shock to rich economies, provides a test case for this assumption.

ECONOMICS

ACCOMPANYING PAPER The full academic working paper is published separately as a PDF at nikkhosravipour.com. This document is the essay itself, for reading.

Long-horizon projection models assume stable growth-determinant relationships, but the 2008 crisis, the strongest post-war shock to rich economies, provides a test case for this assumption. This thesis examines the impact of the 2008 crisis on the relationship between growth determinants and output, using a sample of 24 OECD members from 1996 to 2019, based on the Penn World Table 11.0. A balanced panel with two-way fixed effects is employed, incorporating augmented-Solow regressors and break tests at 2008 and 2010, as well as a sup-Wald scan across years. Mean growth fell from 2.5 percent a year before the crisis to 0.6 percent after, with every country experiencing slower growth. Every projection model must account for this shift. Projections that assume a return to pre-crisis trends may overestimate future growth.

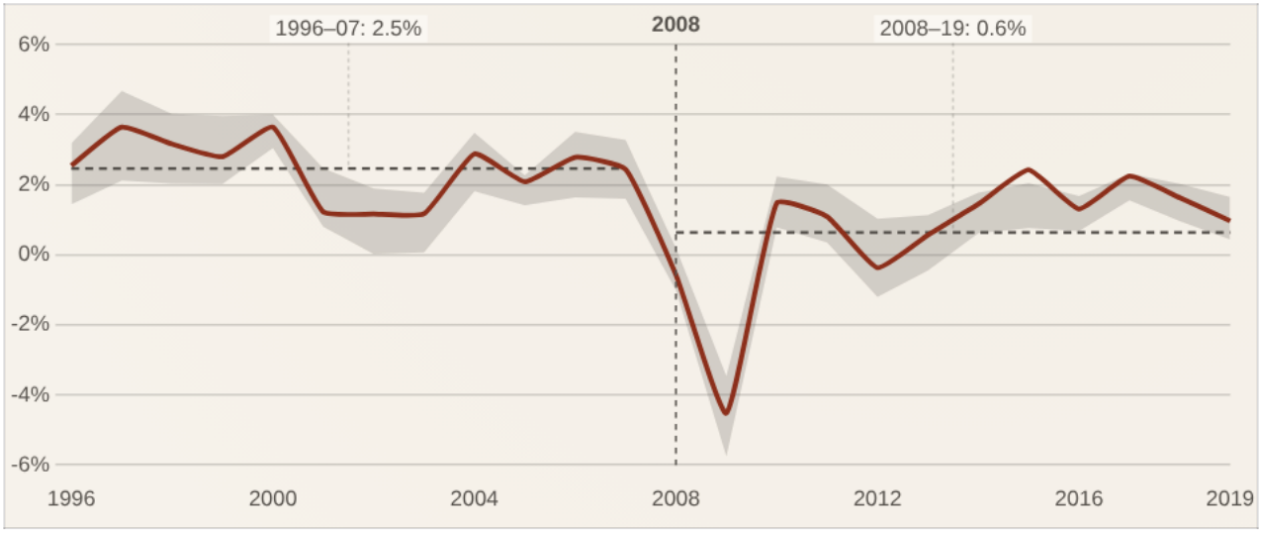

FIG. 1 · LINE CHART OF MEAN GDP PER CAPITA GROWTH ACROSS 24 OECD COUNTRIES FROM 1996 TO 2019, SHADED BY THE INTERQUARTILE RANGE, WITH A MARKER AT 2008 AND THE PRE- AND POST-2008 PERIOD AVERAGES SHOWN AS DASHED SEGMENTS

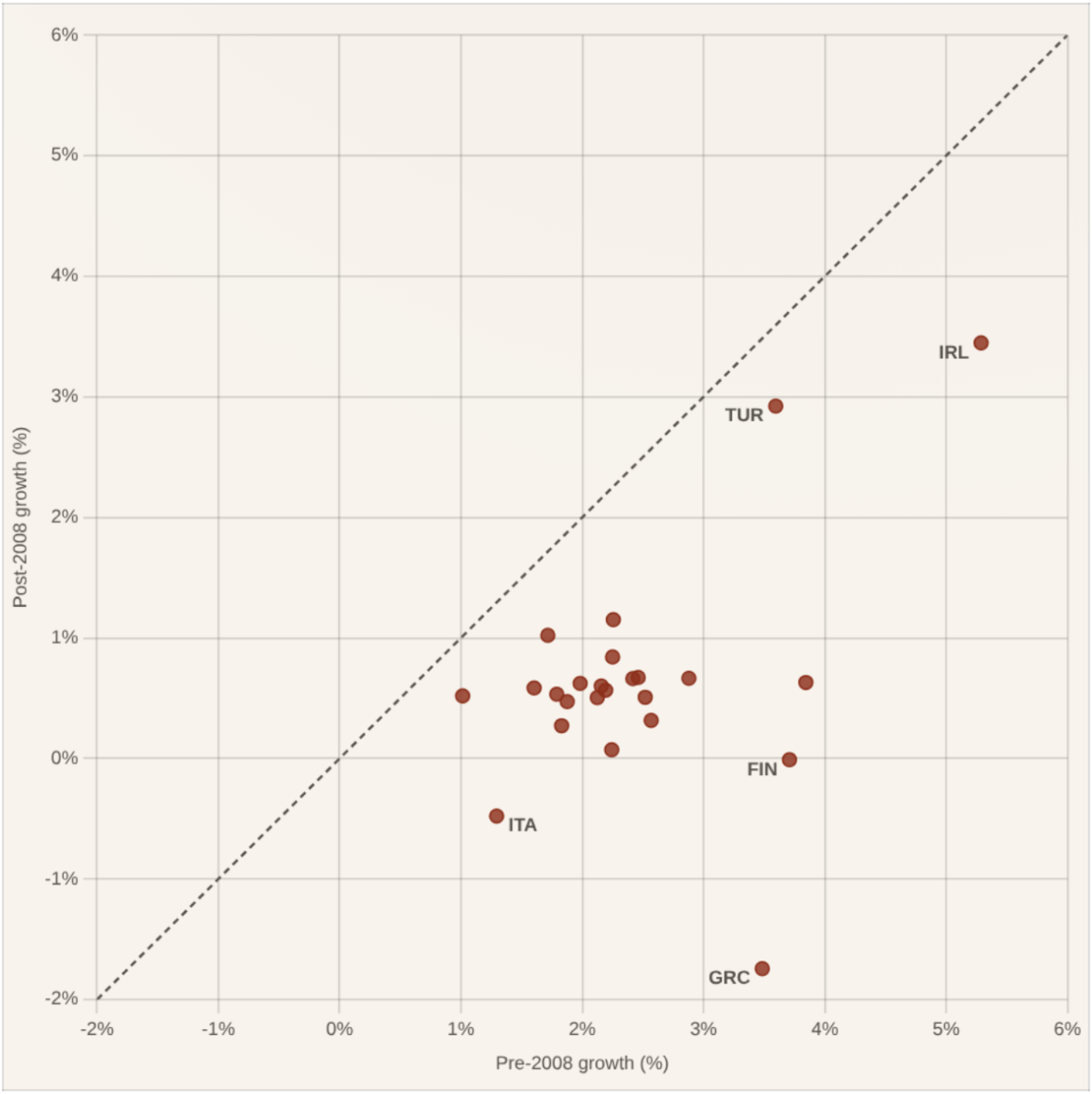

FIG. 2 · SCATTER PLOT OF PRE-2008 VERSUS POST-2008 MEAN GROWTH FOR 24 OECD COUNTRIES, WITH A REFERENCE LINE MARKING NO CHANGE; EVERY COUNTRY FALLS BELOW THE LINE

Data

OECD members before 1995 are selected for the sample, which spans from 1996 to 2019, and is based on the Penn World Table 11.0. Growth, the dependent variable, is measured as annual growth in real GDP per head. Across the sample, the average growth rate is 1.6 percent, with a spread of 2.6 percentage points. Regressors include lagged log income, investment share, log human-capital index, and population growth, with averages of 25.6 percent of GDP for investment and 0.7 percent for population growth.

Method

A two-way fixed effects model is used, with country effects and year effects, and standard errors are

clustered by country with a CR2 correction and Satterthwaite degrees of freedom. Known-date tests are performed for each regressor times a post-crisis dummy, with joint zero tests on the four interactions and candidate years 2008 and 2010. Where the break date is unknown, the sup-Wald scan is used, refitting the model at every year, with 15 percent trimming at both ends. Because the sample has only 24 clusters, the CR2 correction is necessary to obtain reliable standard errors.

Findings

Before 2008, the average growth rate was 2.5 percent a year, compared to 0.6 percent after. Two of the four regressors, convergence and investment, are significant within countries. Convergence is estimated to be minus 0.074, with a p-value of 0.009. Investment is estimated to be 0.163, with a p-value of 0.014, indicating that a ten-point increase in investment is associated with approximately 1.6 percentage points more growth. At 2008, the interactions are tested, and none are significant alone, although the investment interaction is 0.108, with a p-value of 0.075. No break test rejects stability, with joint F-statistics of 1.30 and 1.03 for 2008 and 2010, respectively.

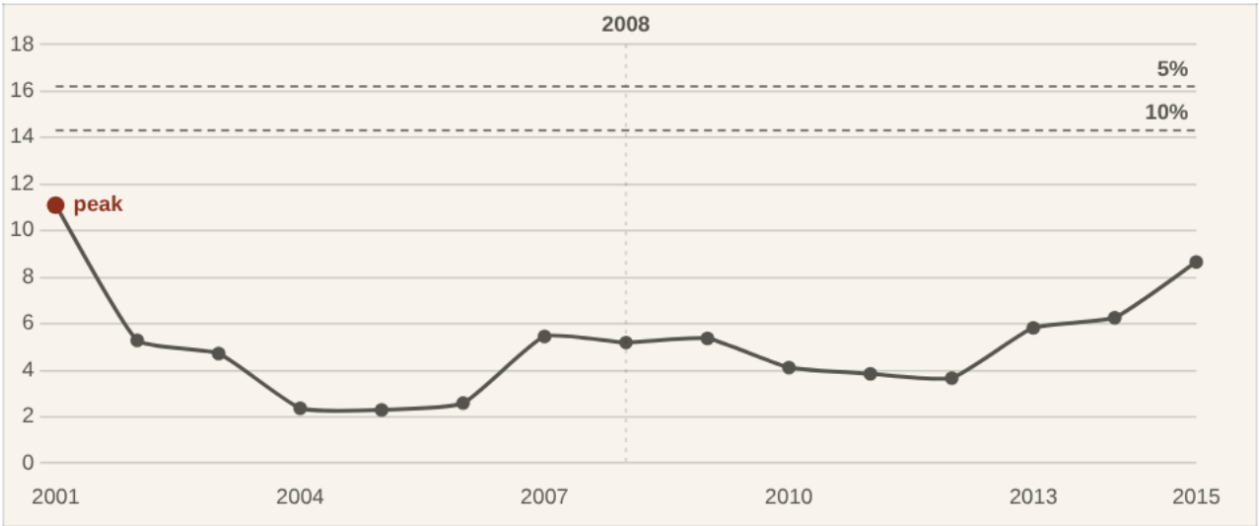

FIG. 3 · LINE CHART OF THE WALD STATISTIC FOR A STRUCTURAL BREAK AT EACH CANDIDATE YEAR FROM 2001 TO 2015, WITH DASHED REFERENCE LINES AT THE 10 PERCENT AND 5 PERCENT CRITICAL VALUES AND THE PEAK AT 2001 MARKED

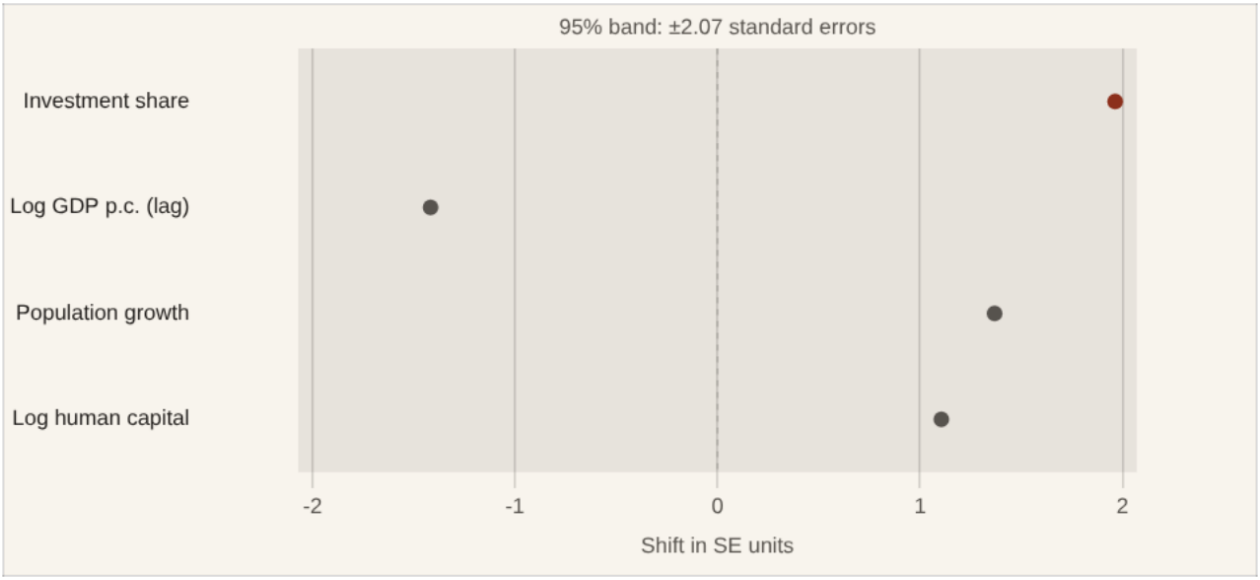

FIG. 4 · HORIZONTAL CHART OF THE POST-2008 SHIFT IN FOUR GROWTH-REGRESSION COEFFICIENTS, EXPRESSED IN STANDARD-ERROR UNITS, WITH A SHADED BAND MARKING SHIFTS NOT DISTINGUISHABLE FROM ZERO; ONLY THE INVESTMENT-SHARE COEFFICIENT APPROACHES THE EDGE OF THE BAND

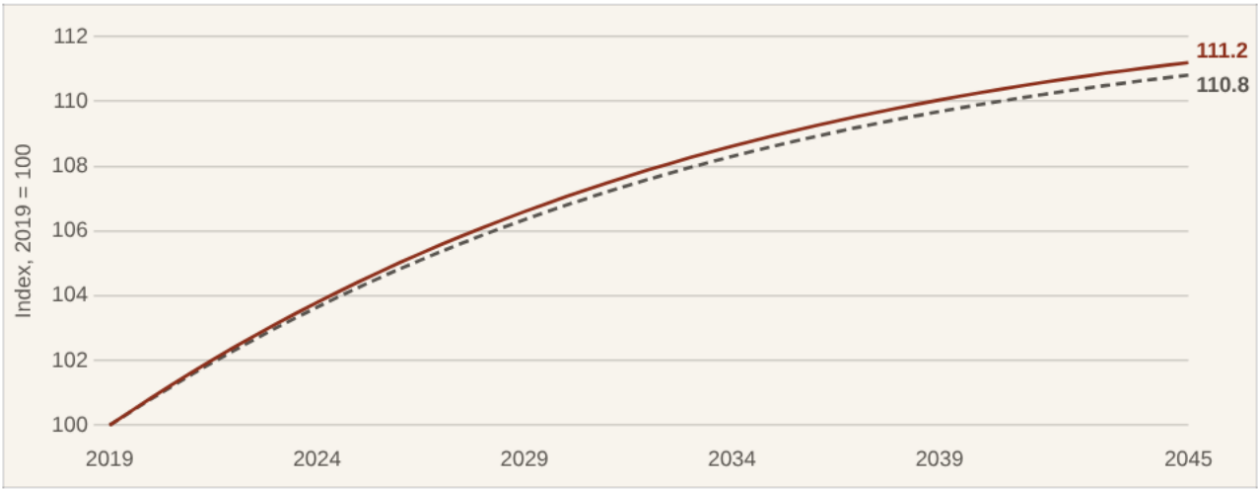

FIG. 5 · LINE CHART OF TWO PROJECTED GROWTH PATHS FROM 2019 TO 2045, INDEXED TO 100 IN 2019, UNDER PRE-CRISIS VERSUS POST-CRISIS COMMON GROWTH COMPONENTS; THE TWO PATHS ARE NEARLY IDENTICAL

Robustness

Dropping Ireland from the sample results in a catch-up coefficient of minus 0.069, with a p-value of 0.085, and an investment coefficient of 0.141, with a p-value of 0.060. Replacing population growth with employment growth yields a within R-squared of 0.091 to 0.275, and a coefficient of 0.635, with a p-value below 0.001. Lagging investment by one year results in a coefficient of 0.057, with a p-value of 0.34. Difference GMM estimation yields a Sargan test p-value of 0.93, and an AR(2) test p-value of 0.53, although the catch-up coefficient is imprecise.

Limitations

Power calculations indicate that the test has low power to detect shifts in the investment coefficient, with a threshold of 0.169, and a standard error of 0.055. With only 24 clusters, the test has limited

ability to detect breaks. Failure to reject stability does not prove that the relationships are stable. Schooling and population growth have little within-country movement year to year, making it difficult to detect significant effects. Investment contemporaneousness may be subject to reverse causation, although the lagged result confirms the baseline finding. GMM estimation yields valid diagnostics, but the results are too imprecise to be reliable.

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