The Statistical Behavior of GDP after Financial Crises and Severe Recessions

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Papell and Prodan (PP) ask two questions:

- Do severe recessions associated with financial crises cause permanent reductions in the level of potential real GDP?

- If not, does the recovery take longer for recessions associated with financial crises?

The answers are used to project the post-Great Recession path of real GDP in the United States.

Summary of Paper

These questions are not easy to answer:

- There is a long, yet still unsettled, literature on the long-run effects of shocks to real GDP.

  - Nelson and Plosser (1982), Perron (1989), Kim and Murray (2005)

- Requires identification of reversals in output growth following recessions that occur at variable lags.

- Requires identifying a counterfactual level of trend in the absence of a recession.

Summary of Paper

PP develop a novel modeling strategy to identify and measure "slumps", which consist of recessions and their aftermath.

PP's Model:

$$y_t = \mu + \beta t + \gamma_1 DU_{1t} + \theta_1 DT_{1t} + \theta_2 DT_{2t} + \sum_{i=1}^{k} \rho_i y_{t-i} + u_t$$

$$DU_{1t} = 1 \text{ if } t > Tb_1$$
$$DT_{1t} = t - Tb_1 \text{ if } t > Tb_1$$
$$DT_{2t} = t - Tb_2 \text{ if } t > Tb_2$$

PP focus on three versions of their model:

- **More Restricted**
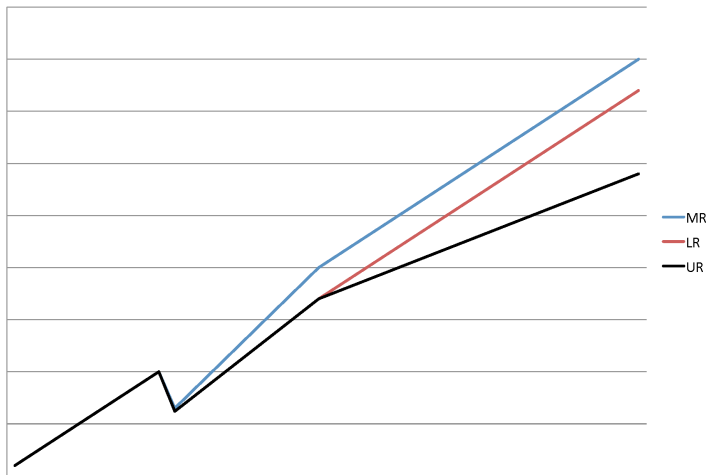 $\theta_2 = -\theta_1$
  $\theta_1(Tb_2 - Tb_1) = -\gamma_1$

- **Less Restricted**
  $\theta_2 = -\theta_1$

- **Unrestricted**

Simulations from PP Model

PP use their model to three ends:

- To identify slumps, they test the null hypothesis of no structural breaks.

- To evaluate whether there are permanent GDP effects of slumps, they test the null hypothesis of the "More Restricted" model.

- To measure the length of slumps, they estimate $Tb_2 - Tb_1$.

Summary of Paper

PP apply their model to analyze slumps in a number of countries. They conclude:

- Slumps associated with financial crises do not have permanent effects on real GDP

- GDP recovers more slowly from slumps associated with financial crises.

- Projected completion of U.S. recovery from the Great Recession: End of 2016.

- A significant existing literature has investigated the long-run effects of recessions on real GDP.

    - Sichel (1994) and Boldin (1996)
    - Beaudry and Koop (1993)

- A primary difference is parsimony - These models have a single set of parameters governing all recessions in a GDP time series.

- PP instead estimate a set of parameters for each slump.

- This allows flexibility in modeling different patterns of slumps.

Identifying Slumps

- This flexibility comes with a downside - lots of parameters needed to model multiple slumps.

- This raises questions about the power of the procedure to identify slumps.

- There is evidence that relevant slumps were missed.

- For example, the ECRI dates many recessions that are not identified by PP.
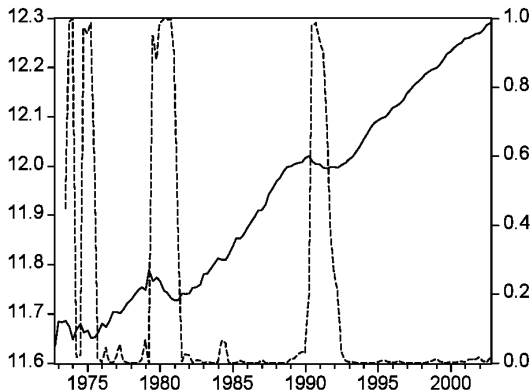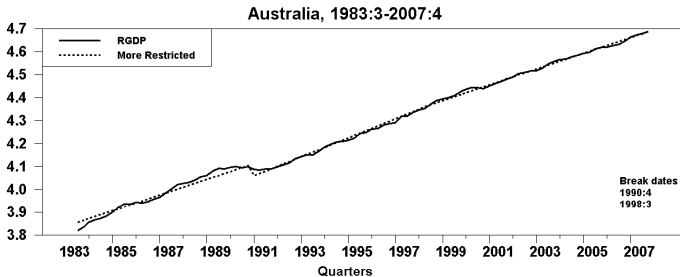
Canada
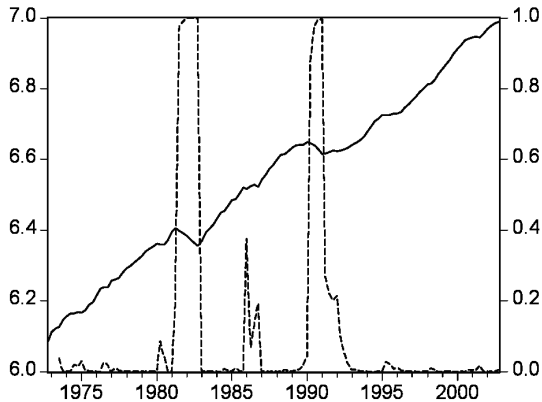
United Kingdom

- Slumps end at the second break date (Tb_2).

- For the "More Restricted" model, this is identified as a change in trend growth from a "slump" growth phase to a "normal" growth phase.

- How well is this identified?

Australian Real GDP (Figure 3 of PP)

Previous Literature

Evidence regarding U.S. post-war recessions is largely consistent with PP:

- Kim and Murray (2002); Kim, Morley and Piger (2005)

Evidence from international data not so sanguine:

- Cerra and Saxena (2008) find large permanent effects of financial crises on output.

- Kim, Morley and Piger (2005) find large permanent effects of recessions in Canada and the U.K.

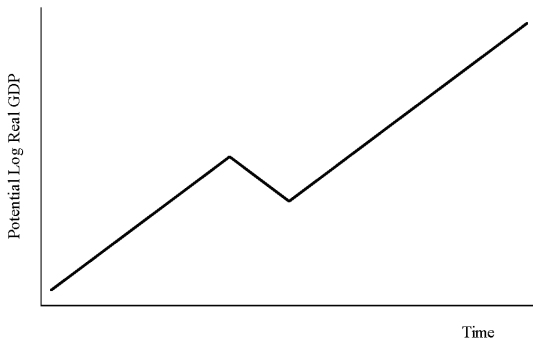*A Simpler Model of a Recession with Permanent GDP Effects*

- The "More Restricted" model produces slumps with only transitory GDP effects.

- To allow for permanent GDP effects, PP remove restrictions.

- An alternative model with permanent GDP effects can be obtained by *adding* restrictions to the "More Restricted" model.

By imposing the restriction $\theta_1 = \theta_2 = 0$, we obtain:

$$y_t = \mu + \beta t + \gamma_1 DU_{1t} + \sum_{i=1}^{k} \rho_i y_{t-i} + u_t$$

Is Japan Relevant to the Great Recession?

- PP note there was no deep decline in the level of real GDP following Japan's early 1990s financial crisis, and argue that this limits its relevance to the U.S. Great Recession.

- However, the decline in growth rates between the two episodes is more similar.

- Also, the post-Great Recession experience to date is consistent with slower growth, rather than a recovery.

PP have provided us with a novel modeling strategy for identifying slumps and measuring their long-run effects.

Future research that investigates the role of policy in generating different paths of recovery following recessions will be of considerable interest.