DE – Germany

The *Deutsche Bundesbank* produces an annual, nationwide house price index for existing, terraced houses. Terraced houses are defined as single-family properties with a living space of approximately 100 square meters. Only dwellings that meet comfortable living standards in medium to good locations are included. This data is obtained through BulwienGesa AG which, in turn, draws its numbers from different sources: Association of German Real Estate Agents (Immobilienverband Deutschland-IVD), Chambers of Industry and Commerce, Surveyor Committees, Building and Loan Associations, Research Institutions, their own surveys, newspaper advertisements, etc. The mix-adjusted method is used to construct the index. Dwellings are categorized by type and location. Dwellings are aggregated according to construction statistics, which are taken from the 1998 micro census for data up to 2004 and the 2002 micro census for data starting in 2005. However, since we choose to focus only on terraced houses, no aggregation across property type is made. Prices from each city are weighted by population data from 2005. Data prior to 2005 is weighted using population data from 2000. The nationwide aggregate draws data from 100 cities from the former Western Germany and 25 cities from the former Eastern Germany (all of Berlin is classified as part of Eastern Germany since 1995). The nationwide index begins in 1995 and is extended with available annual historical data from 1990 through 1994 from the same source that does not include Eastern Germany.

The source of the current house price data has changed. Starting in 2000, the series is based on the quarterly price index for existing residential property developed by the Federal Statistical Office (Destatis). This affects the 2016 second quarter release and all subsequent updates. The quarterly series uses the hedonic method and tracks the prices to be paid for existing single-family and two-family houses and existing dwellings in apartment blocks, including the land. It matches closely with the annual *Bundesbank* series that was used previously and that we retain to extend the quarterly series before 2000.

To extend the data prior to 1990, we use another index obtained from the *Bundesbank*. For 1975-1989, we use an annual house price index for new terraced houses in West Germany (including only a group of 50 cities). This series goes back to 1975. However, because the designation of new and existing dwellings was not formally introduced until 1990, the inclusion of existing dwellings in this index cannot be completely ruled out. New dwellings in this series of West Germany for new terraced houses are aggregated based on each dwelling's estimated construction cost. Cities are weighted according to population data, using the same vintages of population data as the aggregate series for all of Germany. We splice the annual series for all of Germany with the growth rate of the longer series for West Germany, and then interpolate the resulting series to a quarterly frequency using the quadratic-match average method. We then splice the Destatis series with the growth rates of the interpolated historical series.

The house price series are not seasonally-adjusted by the source. We seasonally-adjust the spliced and interpolated series using the BSTS model and re-base the series to 2005=100. Before the 2016 second quarter release, the primary data that we used was released annually, so at least four quarters would have elapsed if we had waited for the *Bundesbank* official data publication. To avoid this lag and make the public release of the data more timely, we originally nowcasted the spliced annual series for Germany one period ahead using a simple AR(2) model. The

nowcasting method used then changed, affecting the 2012 first quarter update and all subsequent updates that used the annual series. We switched to the BSTS model to add one extra yearly observation that could be jointly interpolated. The quarterly estimates obtained using interpolated nowcasts were subsequently replaced as the official annual data became publicly available.

We deflate the house price series using the Personal Consumption Expenditure (PCE). The PCE series for Germany is obtained from the OECD Economic Outlook database. It is reported at a quarterly frequency and begins in the first quarter of 1991. We use the growth rates of the West Germany PCE deflator, obtained from the OECD Economic Outlook database, to extend the German PCE deflator to the first quarter of 1975.

We complete the German data by reporting personal disposable income (PDI) on a *per capita* basis. We used initially the extended and interpolated quarterly PDI and working age series for Germany from the OECD Economic Outlook database. The source of the current PDI and working age population data has changed. This affects the PDI series for the 2012 first quarter update and all subsequent updates. Net disposable income is collected from the *Bundesbank*. The series is reported at a quarterly frequency and begins in 1991. The measure of net disposable income published by the *Bundesbank* includes changes in equity in pension fund reserves. To maintain consistency across countries, we subtract this component. Data on equity and pension fund reserves (from 1999-present) is obtained from Eurostat; this is extended using data from the OECD Economic Outlook database. To extend the net disposable income series back to 1975, we use the net disposable income series for West Germany published in the OECD Outlook database 88. Both PDI come seasonally adjusted from the source. Current working age population data is now obtained from the OECD Main Economic Indicators database. Working age population is reported at a quarterly frequency and begins in the first quarter of 2005. We use the quarterly growth rates of the discontinued working age population series from the OECD Outlook 90 database to extend the series to the first quarter of 1975. We divide the household disposable income by working-age population to create nominal PDI *per capita*. We use the PCE deflator to express the series in real terms. Both nominal and real PDI measures are rebased to 2005=100.

References:

Hoffman and Lorenz (2006): "Real Estate Price Indices in Germany: Past, Present and Future."

Information Resources:

Federal Statistical Office (Destatis) Data
https://www.destatis.de/EN/FactsFigures/NationalEconomyEnvironment/Prices/ConstructionPricesRealPropertyPrices/ConstructionPricesRealPropertyPrices.html

Deutsche Bundesbank Data
http://www.bundesbank.de/Navigation/EN/Statistics/Time_series_databases/Enterprises_and_households/enterprises_and_households_node.html

BulwienGesa AG Data
http://www.bulwiengesa.de/index.php?id=start&L=1