

Tech-Pulse Index – Sources and methodology

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This document describes the main data sources and discusses the econometric methodology used to construct the Tech-Pulse index. It also contains a brief summary of the main differences between the methodologies underlying the indexes published before August 2008, on the one hand, and after December 2008, on the other.

Coincident indicators used for the construction of the Tech-Pulse Index.

Industrial production

Index of industrial production of computers, communications equipment, and semiconductors.
(Source: Federal Reserve Board of Governors, monthly, starting January 1970)

Employment:

Payroll employment of the following NAICS industries that are part of the IT sector definition published by the American Electronic Association: NAICS 334000 Computer and Electronic Product Manufacturing, NAICS 517000 Telecommunications, NAICS 518000 ISP, Web Search Portals and Data Processing, NAICS 541500 Computer Systems Design and Related Services.
(Source: U.S. Bureau of Labor Statistics, monthly, starting January 1990)

Private fixed investment

Real private non-residential investment in computers and peripheral equipment, software, and communications equipment. The deflator used is a monthly chain-weighted Thornqvist index constructed using the investment deflators for (i) computers and peripheral equipment, (ii) software, and (iii) communications equipment.
(Source: U.S. Bureau of Economic Analysis, quarterly, starting 1970Q1)

Personal consumption expenditures

Real personal consumption expenditures on computers, peripherals and software.
(Source: U.S. Bureau of Economic Analysis, monthly, starting January 1990)

Shipments

Manufacturers' shipments of computers and electronic products in current dollars, used for January 1992 onwards. For before January 1992, series is merged with Manufacturer's shipments of information technology industries in current dollars.
(Source: U.S. Census Bureau, monthly, starting January 1970)

Econometric Methodology

The Tech-Pulse Index is an index of coincident indicators of activity in the U.S. information technology sector, constructed using the methodology proposed by Stock and Watson (1989) and implemented by Clayton-Matthews (2001). It can be interpreted as a summary statistic that tracks the health of the tech-sector in a timely manner. The indicators used to compute the index are investment, consumption, employment, industrial production, and shipments in the technology sector. The index extracts the common trend that drives these series.

Replication files of the Tech-Pulse Index are available upon request from bart.hobijn@sf.frb.org. These files contain the programs used to generate the index as well as files that contain the particular specification and estimates of the state-space model that is used to construct the index. This model is re-estimated every month. Consequently, every month the whole historical time series of the index is revised.

Changes with respect to previous Tech Pulse Index

- The current Tech-Pulse Index replaces the separate `real` and `nominal` Tech-Pulse Indices that were released previously. The reason for this is that the `real` and `nominal` indices were highly correlated. For interpretative purposes, we have decided to focus on one summary measure, rather than two.
- Shipments are included in current dollars and are not deflated anymore by a constructed shipments deflator used in the real Tech-Pulse Index.
- The deflator of private fixed investment has been recalculated as a monthly chain-weighted Thornqvist index.
- The personal consumption data are now only included from January 1990 onwards.

Replication files

Replication files of the Tech-Pulse Index are available upon request from bart.hobijn@sf.frb.org.

References

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Clayton-Matthews, Alan. 2001. "DSFM [Dynamic Single Factor Model Software] Manual." Version 4/17/01. Available at <http://users.rcn.com/alancm/dsfm/index.html>.

Stock, James H., and Mark W. Watson. 1989. "New Indexes of Coincident and Leading Economic Indicators." *NBER Macroeconomics Annual 1989*, 351-94. Cambridge: MIT Press.