

These data were prepared by a project in the Michigan Census Research Data Center and have been authorized for public release by the Census Bureau. This user guide documents data available at <http://www.umich.edu/~shapiro/data/SPC/>

Caution: Read this document prior to using these data. In particular, note the following.

- Our preferred measure of capital utilization is plant hours per week weighted by historical capital stock and corrected for outliers (phw_adj_K4).
- Detailed information about construction of the series, samples, etc. is available in Gorodnichenko and Shapiro (2010, 2011).
- Note that some of the measures, such as weighted by labor, are likely to be misleading as argued in Shapiro (1996) and Gorodnichenko and Shapiro (2010, 2011). Specifically, opening an extra shift in an existing facilities increases capital utilization, but not the capital stock. Weighting by labor therefore gives disproportionate weight to the capital at multi-shift plants. *These alternative measures are included in the database to document this effect, and should not be used to correct that capital stock for changes in utilization.*

The public release files contain series of capital utilization at the aggregate (web_SPC_agg.dta) and 2-digit SIC (web_SPC_sic2.dta) levels as well as for selected 3-digit SIC industries (web_SPC_sic3.dta). See Table 1 for summary of variables.

In each file, variables are named as follows. The first three letters indicate which measure of capital utilization is reported: average plant hours per week (**PHW**); average plant hours per day (**PHD**); average number of plant days in operation (**POD**). For a given measure of capital utilization series, which we denote with **KU**, there are four suffixes indicating which weights are used in constructing capital utilization:

- **WGT**: simple average (use only sampling weights w_{it}):

$$\overline{KU}_t = \frac{\sum_i KU_{it} w_{it}}{\sum_i w_{it}};$$

- **adj_tvsCM**: weighted by output (Y_{it} ; total value of shipments from the most recent Census of Manufacturers) with weights adjusted for influential observations:

$$\overline{KU}_t^{(Y)} = \frac{\sum_i KU_{it} w_{it} Y_{it}}{\sum_i w_{it} Y_{it}};$$

- **adj_K4**: weighted by capital stock (K_{it} ; balance sheet value of fixed assets from the most recent Census of Manufacturers) with weights adjusted for influential observations:

$$\overline{KU}_t^{(K)} = \frac{\sum_i KU_{it} w_{it} K_{it}}{\sum_i w_{it} K_{it}},$$

- **adj_teCM**: weighted by employment (L_{it} ; total number of employees from most recent Census of Manufacturers) with weights adjusted for influential observations:

$$\overline{KU}_t^{(L)} = \frac{\sum_i KU_{it} w_{it} L_{it}}{\sum_i w_{it} L_{it}}.$$

Additional statistics based on the replacement value of capital, total hours of production workers and other variables as well as series not adjusted for influential observations are available upon request. Adjustment for influential observations is desirable because otherwise time series can be dominated by reporting errors, unusual events and other irregularities. As argued in Gorodnichenko and Shapiro (2011), the preferred measure of capital utilization is $\overline{KU}_t^{(K)}$ calculated based on plant hours per week (**PHW**).

Series with prefix **SD** report standard errors for the corresponding capital utilization series. For example, **phw_adj_K4**, which is our preferred measure of capital utilization, reports capital utilization (plant hours per week) series aggregated from plant level to industry or economy level with capital as weights ($\overline{KU}_t^{(K)}$). Series **sd_phw_adj_K4** reports the standard error for estimated capital utilization in **phw_adj_K**

Detailed information about construction of the series, samples, etc. is available in Gorodnichenko and Shapiro (2011, 2009).

References

Gorodnichenko, Yuriy, and Matthew D. Shapiro, 2011. "Using the Survey of Plant Capacity to Measure Capital Utilization." Working Paper. US Bureau of the Census, Center for Economic Studies.

Gorodnichenko, Yuriy, and Matthew D. Shapiro, 2009. "Using the Survey of Plant Capacity to Measure Capital Utilization: Technical memorandum." Technical memorandum. US Bureau of the Census, Center for Economic Studies.

Shapiro, Matthew D., 1986. "Capital Accumulation and Capital Utilization: Theory and Evidence." *Journal of Applied Econometrics* 1, 211-234.

Table 1. Key to variables in Gorodnichenko and Shapiro Capital Utilization database

variable name	variable label
year	year
phw_wgt	Plant hrs/week, weighted with sample weights only
pod_wgt	Plant days/week, weighted with sample weights only
phd_wgt	Plant hrs/day, weighted with sample weights only
sd_phw_wgt	STD Plant hrs/week, weighted with sample weights only
sd_pod_wgt	STD Plant days/week, weighted with sample weights only
sd_phd_wgt	STD Plant hrs/day, weighted with sample weights only
phw_adj_K4	Plant hrs/week, weighted by historical capital stock, adjust. outliers **PREFERRED MEASURE**
phd_adj_K4	Plant hrs/day, weighted by historical capital stock, adjust. outliers
pod_adj_K4	Plant days/week, weighted by historical capital stock, adjust. outliers
sd_phw_adj_K4	STD Plant hrs/week, weighted by historical capital stock, adjust. outliers
sd_phd_adj_K4	STD Plant hrs/day, weighted by historical capital stock, adjust. outliers
sd_pod_adj_K4	STD Plant days/week, weighted by historical capital stock, adjust. outliers
phw_adj_tvsCM	Plant hrs/week, weighted by TVS (from CM), adjust. outliers
phd_adj_tvsCM	Plant hrs/day, weighted by TVS (from CM), adjust. outliers
pod_adj_tvsCM	Plant days/week, weighted by TVS (from CM), adjust. outliers
sd_phw_adj_tvsCM	STD Plant hrs/week, weighted by TVS (from CM), adjust. outliers
sd_phd_adj_tvsCM	STD Plant hrs/day, weighted by TVS (from CM), adjust. outliers
sd_pod_adj_tvsCM	STD Plant days/week, weighted by TVS (from CM), adjust. outliers
phw_adj_teCM	Plant hrs/week, weighted by total employment (from CM), adjust. outliers
phd_adj_teCM	Plant hrs/day, weighted by total employment (from CM), adjust. outliers
pod_adj_teCM	Plant days/week, weighted by total employment (from CM), adjust. outliers
sd_phw_adj_teCM	STD Plant hrs/week, weighted by total employment (from CM), adjust. outliers
sd_phd_adj_teCM	STD Plant hrs/day, weighted by total employment (from CM), adjust. outliers
sd_pod_adj_teCM	STD Plant days/week, weighted by total employment (from CM), adjust. outliers

abbreviations:

PHW=plant hours per week, POD=plant days per week, PHD=plant hours per day

SD,STD=standard deviation

K4=historical value of capital, TVS=total value of sales, TE=total employment

CM=Census of Manufactures