

**Data Appendix**  
“The French Depression in the 1930s”  
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**Original Data: Description**

Note: Unless otherwise stated, all series are for France over the period 1929-1939.

- O.1 Real GDP, Expenditures Approach, France, 1919-1939 (billions of 1938 French Francs)
- O.2 Total Populations, middle of the year (Thousands)
- O.3 Detrended Per Capita GDP, United States, 1929-1939 (index, 1929=100)
- O.4 Total Household Consumption (billions of 1938 French Francs)
- O.5 Total Firms Investment (billions of 1938 French Francs)
- O.6 Household Housing Investment (billions of 1938 French Francs)
- O.7 Government Investment (billions of 1938 French Francs)
- O.8 Government Consumption (billions of 1938 French Francs)
- O.9 Exports (billions of 1938 French Francs)
- O.10 Imports (billions of 1938 French Francs)
- O.11 Household Consumption in Agricultural Goods (billions of 1938 French Francs)
- O.12 Household Consumption in Industrial Goods (billions of 1938 French Francs)
- O.13 Household Consumption in Services, Excluding Housing (billions of 1938 French Francs)
- O.14 Household Consumption in Housing Services (billions of 1938 French Francs)
- O.15 Total Employment (Thousands)
- O.16 Workweek Length (Hours)
- O.17 Capacity Utilization (percentage) (Note: the series is not computed from survey)
- O.18 Monetary Aggregate M2, End of the Year (billions of French Francs)
- O.19 GDP Deflator (index, 1938=1)
- O.20 Money Market Interest Rate (percent per year)
- O.21 Household Consumption Price (index, 1938=1)
- O.22 Wholesale Price Index (45 items) (index, 1938=1)
- O.23 Production Price Index (index, 1938=1)
- O.24 Hourly Wage Index (French Francs)
- O.25 Annual Real Per Capita Output, International Average (index, 1929=100)
- O.26 Gross Stock of Non Residential Buildings (billions of 1938 French Francs)
- O.27 Gross Stock of Machineries and Equipments (billions of 1938 French Francs)
- O.28 Real GDP, Expenditures Approach, France, 1890-1985 (billions of 1938 French Francs)
- O.29 Total Population, middle of the year, France, 1890-1985 (Thousands)

## Original Data: Source

Note: The series referred to as “Villa, X, Y.XLS” refers to the databank of Pierre Villa, available at <http://www.cepii.fr/francgraph/bdd/villa/mode.htm> (in French). The acronym of the series is X, and can be found in the file Y.XLS on this website.

The data can also be found in printed form in:

- a) Villa, Pierre, « Une analyse macro-économique de la France au XXème siècle », Edition du CNRS, Paris, 1993
- b) Villa, Pierre, « Un siècle de données macro-économiques », INSEE Résultats, N°86-87, Paris, 1994

- O.1 Villa, PIBVOL, LONG.XLS
- O.2 Villa, POP, LONG.XLS
- O.3 H.L. Cole and L.E. Ohanian, Table 2, Column 1, Quarterly Review of the Federal Reserve Bank of Minneapolis, Vol. 23, No. 1, pp 2-24
- O.4 Villa, CZM, LONG.XLS
- O.5 Villa, IZE, LONG.XLS
- O.6 Villa, IZM, LONG.XLS
- O.7 Villa, IZG, LONG.XLS
- O.8 Villa, CZG, LONG.XLS
- O.9 Villa, EXPOZT, LONG.XLS
- O.10 Villa, IMPOZT, LONG.XLS
- O.11 Villa, CZA, LONG.XLS
- O.12 Villa, CZB, LONG.XLS
- O.13 Villa, CZD, LONG.XLS
- O.14 Villa, CZLOG, LONG.XLS
- O.15 Villa, EMP, LONG.XLS
- O.16 Villa, DH, LONG.XLS
- O.17 Villa, TUQ, LONG.XLS
- O.18 Villa, M2, LONG.XLS
- O.19 Villa, PPIBV, LONG.XLS
- O.20 Villa, TXMM, LONG.XLS
- O.21 Villa, PCM, LONG.XLS
- O.22 Villa, PGROS, LONG.XLS
- O.23 Villa, PP, LONG.XLS
- O.24 Villa, WHPE, LONG.XLS
- O.25. H.L. Cole and L.E. Ohanian, Table 7, Column 2, Quarterly Review of the Federal Reserve Bank of Minneapolis, Vol. 23, No. 1, pp 2-24
- O.26 Villa, KBZ, LONG.XLS
- O.27 Villa, KMZ, LONG.XLS
- O.28 Villa, PIBZQ, PROD.XLS
- O.29 Villa, POP, LONG.XLS

## Constructed Series: Description

Note: Unless otherwise stated, all series are for France over the period 1929-1939.

- C.1 Index of Per Capita Real GDP (1929 = 100)
- C.2 Index of Per Capita Private Consumption (1929 = 100)
- C.3 Index of Per Capita Private Investment (1929 = 100)
- C.4 Index of Per Capita Government Purchases (1929 = 100)
- C.5 Index of Per Capita Exports (1929 = 100)
- C.6 Index of Per Capita Imports (1929 = 100)
- C.7 Index of Detrended Per Capita Real GDP (1929 = 100)
- C.8 Index of Detrended Per Capita Private Consumption (1929 = 100)
- C.9 Index of Detrended Per Capita Private Investment (1929 = 100)
- C.10 Index of Detrended Per Capita Government Purchases (1929 = 100)
- C.11 Index of Detrended Per Capita Exports (1929 = 100)
- C.12 Index of Detrended Per Capita Imports (1929 = 100)
- C.13 Index of Detrended Per Capita Households Investment (1929 = 100)
- C.14 Index of Detrended Per Capita Firms Investment (1929 = 100)
- C.15 Index of Detrended Per Capita Government Investment (1929 = 100)
- C.16 Index of Detrended Per Capita Government Consumption (1929 = 100)
- C.17 Index of Detrended Per Capita Household Consumption in Agricultural Goods (1929 = 100)
- C.18 Index of Detrended Per Capita Household Consumption in Industrial Goods (1929 = 100)
- C.19 Index of Detrended Per Capita Household Consumption in Services except Housing (1929 = 100)
- C.20 Index of Detrended Per Capita Household Consumption in Housing Services (1929 = 100)
- C.21 Private Consumption to GDP ratio (percentage)
- C.22 Private Investment to GDP ratio (percentage)
- C.23 Government Purchases to GDP ratio (percentage)
- C.24 Exports to GDP ratio (percentage)
- C.25 Imports to GDP ratio (percentage)
- C.26 Index of Per Capita Total Employment (1929=100)
- C.27 Index of Workweek Length (1929=100)
- C.28 Index of Per Capita Total Worked Hours (1929=100)
- C.29 Index of Per Capita Monetary Mass (M2) (1929=100)
- C.30 GDP Deflator (1929=100)
- C.31 Index of Detrended Per Capita Real Monetary Mass (M2) (1929=100)
- C.32 Consumer Price Index (1929=100)
- C.33 Wholesale Price Index (1929=100)
- C.34 Production Price Index (1929=100)
- C.35 Index of Detrended Real Wage, Using CPI (1929=100)
- C.36 Index of Detrended Real Wage, Using PPI (1929=100)
- C.37 Index of Undetrended Real Wage, Using CPI (1929=100)
- C.38 Index of Undetrended Real Wage, Using PPI (1929=100)
- C.39 “Normal” Growth Trend, France (1929=1)

- C.40 “Normal” Growth Trend, United States (1929=1)
- C.41 Index of Undetrended U.S. GDP (1929=100)

### Construction of Series

- C.1 (O.1 / O.2) normalized in 1929
- C.2 (O.4 / O.2) normalized in 1929
- C.3 (O.5 / O.2) normalized in 1929
- C.4 (O.7 + O.8) / O.2) normalized in 1929
- C.5 (O.9 / O.2) normalized in 1929
- C.6 (O.10 / O.2) normalized in 1929
- C.7 C.1 / C.39
- C.8 C.2 / C.39
- C.9 C.3 / C.39
- C.10 C.4 / C.39
- C.11 C.5 / C.39
- C.12 C.6 / C.39
- C.13 (O.6 / (C.39 × O.2)) normalized in 1929
- C.14 (O.5 / (C.39 × O.2)) normalized in 1929
- C.15 (O.7 / (C.39 × O.2)) normalized in 1929
- C.16 (O.8 / (C.39 × O.2)) normalized in 1929
- C.17 (O.11 / (C.39 × O.2)) normalized in 1929
- C.18 (O.12 / (C.39 × O.2)) normalized in 1929
- C.19 (O.13 / (C.39 × O.2)) normalized in 1929
- C.20 (O.14 / (C.39 × O.2)) normalized in 1929
- C.21 (O.4 / O.1) × 100
- C.22 (O.5 / O.1) × 100
- C.23 ((O.7 + O.8) / O.1) × 100
- C.24 (O.9 / O.1) × 100
- C.25 (O.10 / O.1) × 100
- C.26 (O.15 / O.2) normalized in 1929
- C.27 O.16 normalized in 1929
- C.28 ((O.15 × O.16) / O.2) normalized in 1929
- C.29 (O.18 / O.2) normalized in 1929
- C.30 O.19 normalized in 1929
- C.31 (O.18 / (O.19 × O.2 × C.39)) normalized in 1929
- C.32 O.21 normalized in 1929
- C.33 O.22 normalized in 1929
- C.34 O.23 normalized in 1929
- C.35 (O.24 / (O.21 × C.39)) normalized in 1929
- C.36 (O.24 / (O.23 × C.39)) normalized in 1929
- C.37 (O.24 / O.21) normalized in 1929
- C.38 (O.24 / O.23) normalized in 1929
- C.39 calculated as  $(1.0298)^{(t-1929)}$  for  $t = 1929, \dots, 1939$ .
- C.40 calculated as  $(1.0190)^{(t-1929)}$  for  $t = 1929, \dots, 1939$ .
- C.41 (O.3 × C.40)

Normalizing: If a series  $\{x_t\}$  is normalized in date  $T$ , then  $\{x_t\}$  is adjusted as follows:

$$(x_t / x_T) \times 100.$$

## Figures and Tables

Figure 1: The series represented is O.1.

Figure 2: The two series represented are C.1 (France) and C.41 (U.S.)

Figure 3: The two series represented are C.7 (France) and O.3 (U.S.)

Figure 4: The three series represented are C.1, C.40 (France) and O.3 (U.S.)

Figure 5: The figure displays various series of TFP, which are calculated as:

1. steady growth TFP:

$$\left( (1.0298)^{t-1930} \right)^\alpha \times 100$$

2. without variable capacity utilization (normalized in 1930):

$$Y_t / H_t^\alpha K_t^{1-\alpha}$$

3. with variable capacity utilization (normalized in 1930):

$$Y_t / H_t^\alpha (z_t K_t)^{1-\alpha}$$

where  $\alpha = 0.6629$ ,  $Y_t$  is real GDP (O.1),  $H_t$  is hours worked ( $0.15 \times 0.16$ ),  $K_t$  is capital stock ( $0.26 + 0.27$ ) and  $z_t$  is fraction of capacity utilized ( $0.17 / 100$ ).

Figure 6: MODEL RESULTS

Figure 7: MODEL RESULTS

Figure 8: The figure displays per capita real GDP in France: (all series normalized in 1930)

1. actual output: C.1

2. output if embodiment:

$$H_t^\alpha (z_t J_t)^{1-\alpha}$$

where  $\alpha = 0.6629$ ,  $H_t$  is per capita hours worked ( $C.26 \times C.27$ ),  $z_t$  is fraction of capacity utilized ( $0.17 / 100$ ) and  $J_t$  is the effective per capita capital stock, defined according to the accumulation equation and initial condition:

$$J_{t+1} = (1 - \delta_J)J_t + (1 + \gamma_X)^{t-1930} I_t \text{ for } t \geq 1930$$

$$J_{1930} = \frac{I_{1929}}{1 - \frac{1 - \delta_J}{(1 + \gamma_I)(1 + \gamma_X)}}$$

Here,  $I_t$  is per capita investment (O.5 / O.2),  $\delta_J = 0.14$ ,  $\gamma_I = 0.0298$  and  $\gamma_X = \gamma_I \alpha / (1 - \alpha)$ . See article for further explanation.

### 3. Output if disembodiment:

$$((1.0298)^{t-1930} H_t)^\alpha (z_t K_t)^{1-\alpha}$$

where  $\alpha = 0.6629$ ,  $H_t$  is per capita hours worked (C.26 × C.27),  $z_t$  is fraction of capacity utilized (O.17 / 100) and  $K_t$  is per capita capital stock (O.26 + O.27) / O.2.

Figure 9: The figure displays TFP measured for the real GDP series calculated for Figure 8. For each series, TFP is calculated as:

$$TFP_t = \frac{Y_t}{H_t^\alpha (z_t K_t)^{1-\alpha}}$$

where  $Y_t$  is one of the series for real GDP used in Figure 8. The TFP series for steady growth corresponds to the real GDP series for “disembodiment”. The TFP series for “disembodiment” corresponds to the “actual output” real GDP series. The TFP series for “embodiment” corresponds to the “embodiment” real GDP series.

Table 1: Computed using O.28 and O.29

Table 2: Series C.1, C.41 and O.25

Table 3: Series C.1 to C.6

Table 4: Series C.7 to C.12

Table 5: Series C.21 to C.25

Table 6: Series C.13 to C.16

Table 7: Series C.17 to C.20

Table 8: Series C.26 to C.28 and O.17

Table 9: Series C.29 C.30 O.20 and C.31

Table 10: Series C.30 C.32 C.33 and C.34

Table 11: Series C.7 and C.35 to C.38