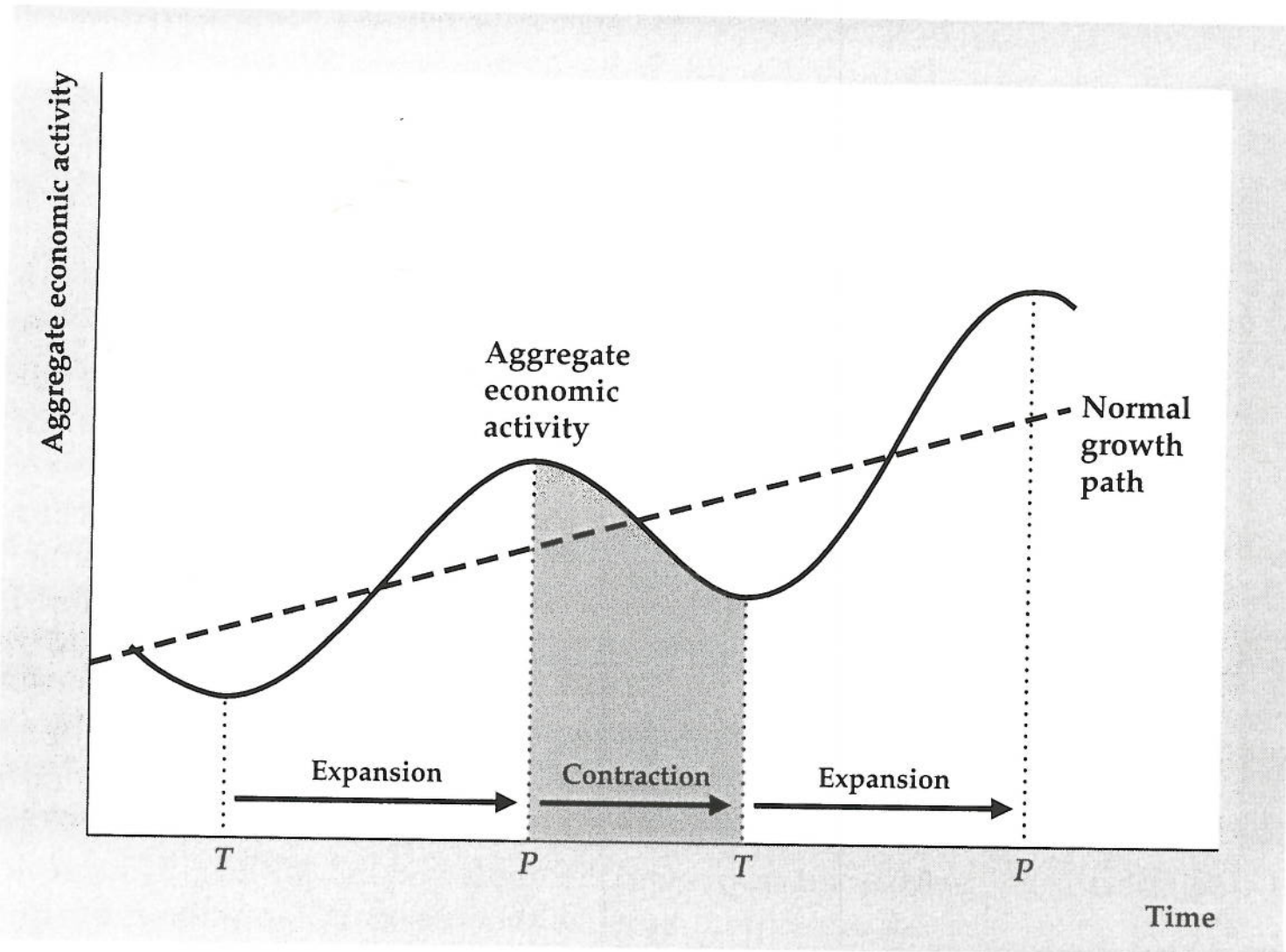


Figure 8.1**A business cycle**

The solid curve graphs the behavior of aggregate economic activity over a typical business cycle. The dashed line shows the economy's normal growth path. During a contraction aggregate economic activity falls until it reaches a trough, T . The trough is followed by an expansion during which economic activity increases until it reaches a peak, P . A complete cycle is measured from peak to peak or trough to trough.



Source: Abel & Bernanke, Macroeconomics, 4th ed., 2001

which aggregate economic activity grows is an **expansion** or a **boom**. After reaching the high point of the expansion, the **peak** (P), aggregate economic activity begins to decline again. The entire sequence of decline followed by recovery, measured from peak to peak or trough to trough, is a **business cycle**.

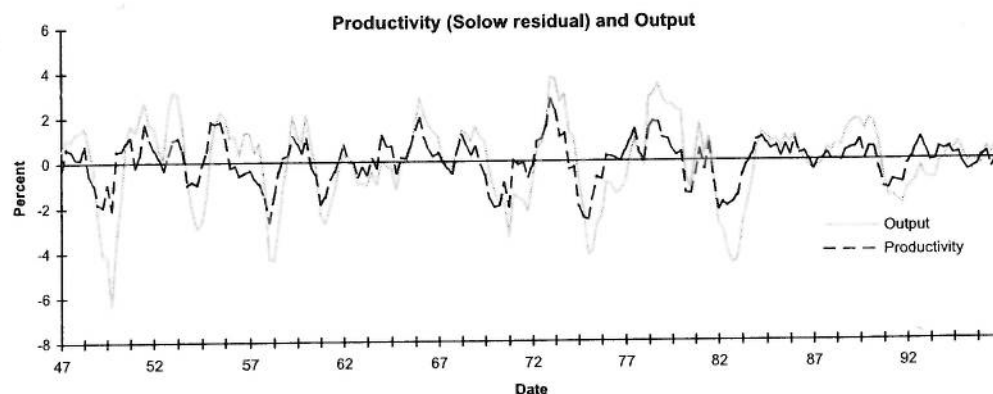
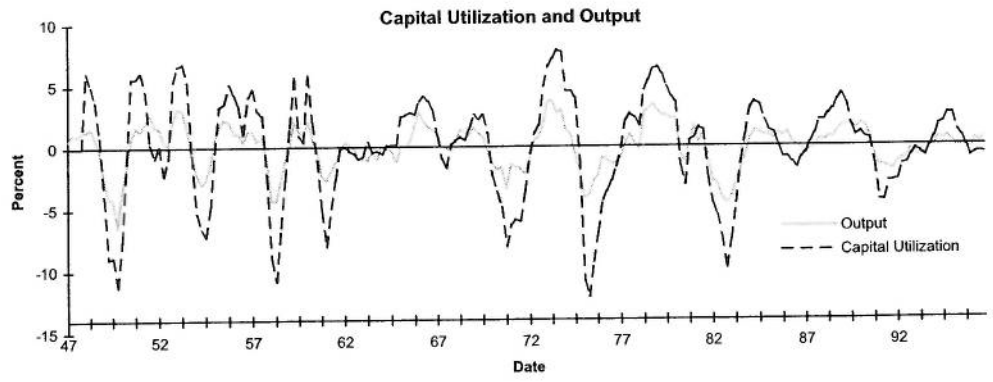
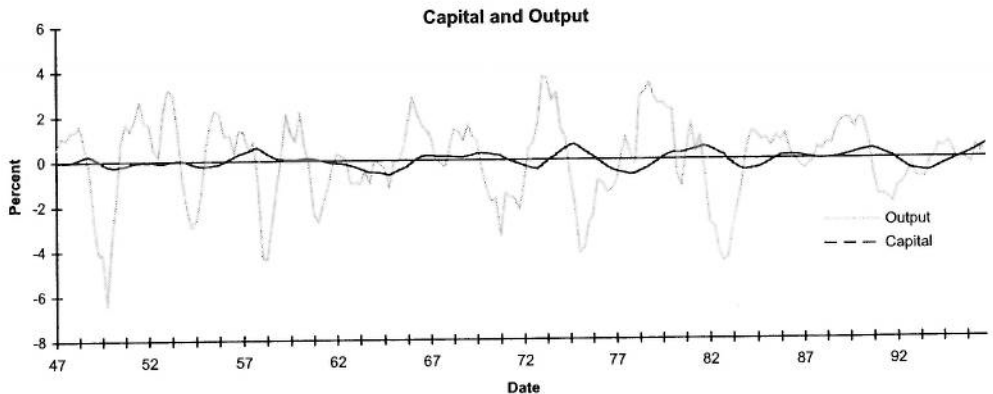
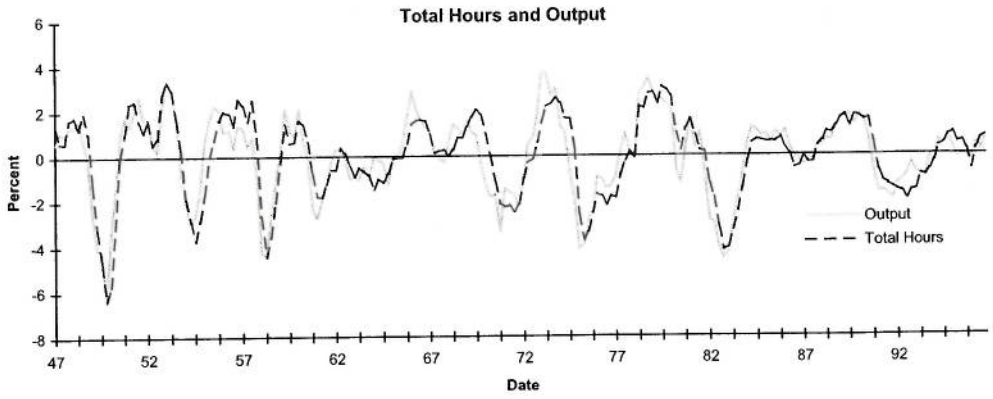


Fig. 3. Cyclical component of US factors of production. Sample period is 1947:1–1996:4. All variables are detrended using the Hodrick–Prescott filter.

Table 1
Business cycle statistics for the US Economy

	Standard deviation	Relative standard deviation	First-order autocorrelation	Contemporaneous correlation with output
<i>Y</i>	1.81	1.00	0.84	1.00
<i>C</i>	1.35	0.74	0.80	0.88
<i>I</i>	5.30	2.93	0.87	0.80
<i>N</i>	1.79	0.99	0.88	0.88
<i>Y/N</i>	1.02	0.56	0.74	0.55
<i>w</i>	0.68	0.38	0.66	0.12
<i>r</i>	0.30	0.16	0.60	-0.35
<i>A</i>	0.98	0.54	0.74	0.78

^a All variables are in logarithms (with the exception of the real interest rate) and have been detrended with the HP filter. Data sources are described in Stock and Watson (1999), who created the real rate using VAR inflation expectations. Our notation in this table corresponds to that in the text, so that *Y* is per capita output, *C* is per capita consumption, *I* is per capita investment, *N* is per capita hours, *w* is the real wage (compensation per hour), *r* is the real interest rate, and *A* is total factor productivity.

easily gauge the relative volatility of the series in question and its comovement with output. Summary statistics for selected series are provided in Table 1¹⁰.

Volatility: Economists have long been interested in understanding the economic mechanisms that underlie the different volatilities of key macroeconomic aggregates. The facts are as follows, working sequentially within each figure and using the notation panel 2.1 to denote panel 1 of Figure 2 and so forth:

- The real *Comover* procyclical The high c displayed i wages, gov correlation *Persiste* order seria This high business cy In prese empirical f cycles. For relations b out nomine over the n of a measu Table 1. T from the n of the real relationship modern ma matching t

Summary 10

source: Abel & Bernanke, Macroeconomics, 2001

The Cyclical Behavior of Key Macroeconomic Variables (The Business Cycle Facts)

USA

Variable	Direction	Timing
Production		
Industrial production	Procyclical	Coincident
<i>Durable goods industries are more volatile than nondurable goods and services</i>		
Expenditure		
Consumption	Procyclical	Coincident
Business fixed investment	Procyclical	Coincident
Residential investment	Procyclical	Leading
Inventory investment	Procyclical	Leading (?)
Government purchases	Procyclical	— ^a
<i>Investment is more volatile than consumption</i>		
Labor Market Variables		
Employment	Procyclical	Coincident or lagging
Unemployment	Countercyclical	Unclassified ^b
Average labor productivity	Procyclical	Leading ^a
Real wage	Procyclical	— ^a
<i>weakly</i>		
Money Supply and Inflation		
Money supply	Procyclical	Leading
Inflation	Procyclical	Lagging
Financial Variables		
Stock prices	Procyclical	Leading
Nominal interest rates	Procyclical	Lagging
Real interest rates	Acyclical	— ^a

Quarterly
[and monthly]
data

^a Timing is not designated by The Conference Board.

^b Designated as "unclassified" by The Conference Board.

Figure
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Figure 8
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standard of living.

a 1982 article* Charles Nelson of the
Washington and Charles Plosser of the
Manchester showed that business cycles are
porary events. Instead, some permanent
put is associated with the typical recess-
nd Plosser examined many macroeco-
s, including measures of output and
sing statistical techniques, they found
variable except the unemployment rate,

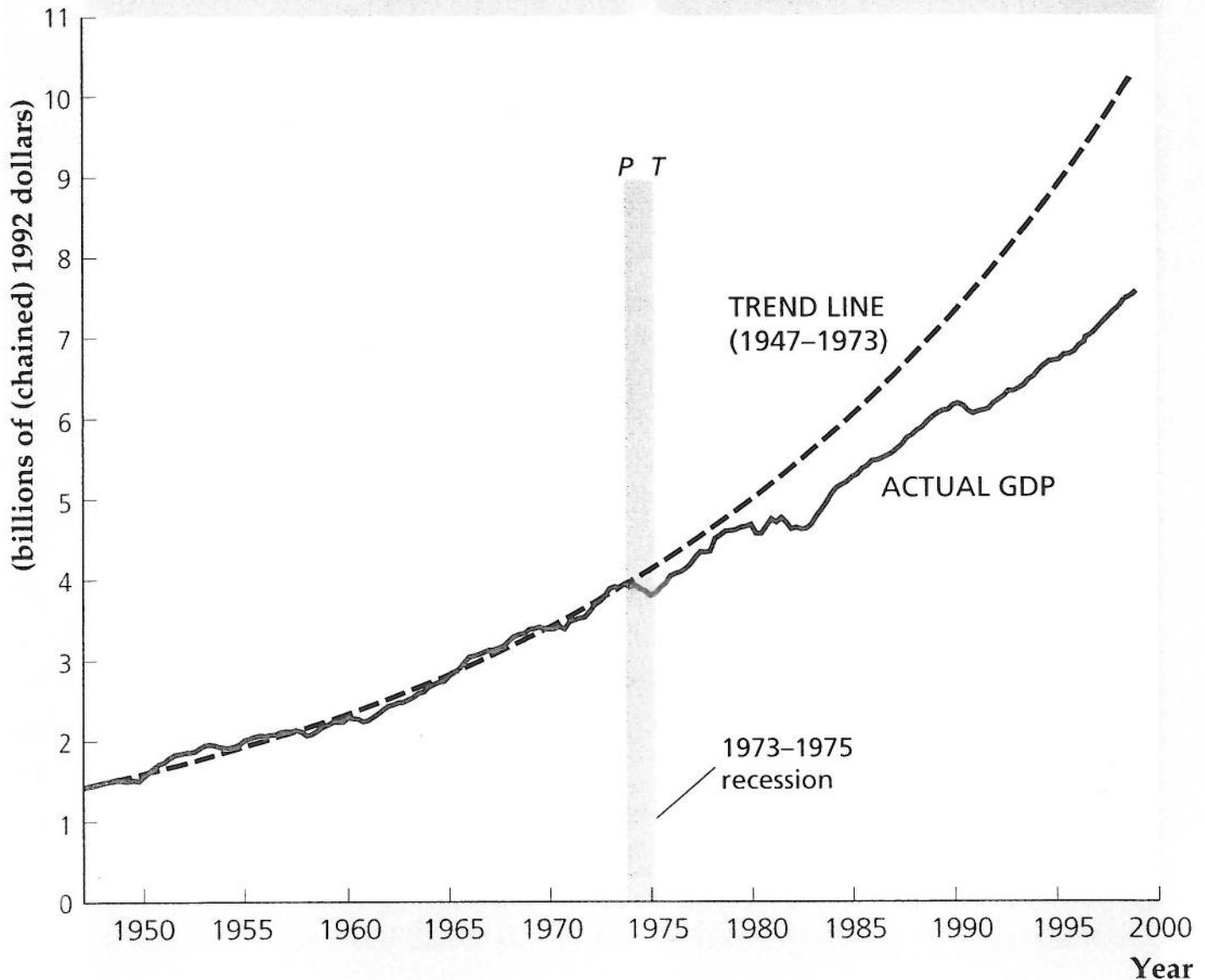
line in the accompanying figure shows actual real
in the United States from 1947 to the second qua
1999. The dashed curve in the figure shows the tre
real output, based on the period 1947–1973 and ex
ed through 1999.† In the 1980s and 1990s GDP rem
well below the levels it would have reached on the
of the earlier trend, suggesting that the 1973–1975
sion was associated with a permanent reduction i
GDP. Of course, we can't conclude that the 1973
recession directly caused the subsequent

(Cont

Permanent components of the business cycle

figure shows actual U.S. real GDP (measured quarterly) and a trend line based on real GDP
with from 1947 to 1973. The economy didn't return to the earlier trend after the 1973 recess-
. Hence much of the output loss of the 1973 recession appears to have been permanent.

es: Real GDP, 1947–1958, from *National Income and Product Accounts of the United States, vol. 1, 1929–1958*, U.S.
Department of Commerce, 1993 (rescaled); real GDP, 1959–1999, Bureau of Economic Analysis.



Wilde: Danthine & Donaldson, EER, 1993, p. 13

Table 6
Labor market variables.

	Sd relative to sd of output				Correlation with output				First-order autocorrelation				Corr (WR, N)	Corr (PROD, N)
	W	N	WR	PROD	W	N	WR	PROD	W	N	WR	PROD		
1. Australia	1.21	1.21	1.68	1.31	-0.23	0.30	0.26	0.48	0.79	0.83	0.46	0.61	0.18	-0.69
2. Austria	1.35	0.59	1.23	0.84	-0.11	0.54	-0.05	0.81	0.56	0.67	0.15	0.34	0.02	-0.06
3. Canada	1.20	0.88	1.15	0.76	-0.50	0.68	-0.16	0.53	0.79	0.89	0.72	0.68	-0.57	-0.26
4. France	2.11	0.72	1.37	1.04	-0.29	0.30	0.07	0.75	0.85	0.94	0.62	0.78	0.22	-0.40
5. Germany	1.13	1.18	0.72	0.92	-0.29	0.65	-0.34	0.25	0.81	0.94	0.63	0.63	0.29	-0.57
6. Italy	1.77	0.50	1.33	0.96	-0.32	0.34	-0.04	0.87	0.85	0.78	0.42	0.61	0.03	-0.17
7. Japan	1.08	0.64	1.77	0.86	0.59	0.53	0.54	0.77	0.74	0.91	0.84	0.64	0.27	-0.13
8. South Africa	-	1.34	-	1.18	-	0.51	-	0.25	-	0.92	-	0.72	-	-0.70
9. Switzerland	0.72	0.92	0.52	0.70	0.01	0.73	0.38	0.47	0.87	0.94	0.57	0.50	0.40	-0.26
10. U.K.	1.49	0.98	1.02	1.03	-0.37	0.45	0.38	0.54	0.84	0.95	0.63	0.61	0.12	-0.51
11. U.S.A.	0.42	0.80	0.37	0.56	-0.27	0.83	0.53	0.60	0.73	0.90	0.66	0.74	0.36	0.05
12. EC 12	1.19	0.55	0.88	0.89	-0.56	0.47	0.02	0.84	0.50	0.62	0.18	0.60	0.21	-0.08

*n = hours
WR = real wage
PROD = Y/N*

