

# The Clinton era and the U.S. business cycle: what did change?\*

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## Abstract

The 1990s were the most prosperous decade in U.S. economic history. The paper analyses to which extent this period fits into preceding cyclical experience. This is done by classifying the period 1991-12 to 2000-12 with the help of a 4-phase classification scheme based on multivariate discriminance analysis. It is shown that in relation to the post 1970 experience, the “fabulous decade” saw considerable shifts of influence between the 19 classifying variables. Most noteworthy are the much reduced influence of M2, Net Exports, and Unemployment on the one side and the increase of Real GNP, inflation, Government Expenditure and of Unit Labor Cost on the other side. This confirms interpretations of the fabulous decade as the result of a forbearing monetary policy made possible by a deficit targeting fiscal policy, low inflation and a productivity jump. However, the era loses some of its uniqueness when it is seen in the entire post WW II cycle history.

Key Words: U.S. business cycle, 4-phase scheme, discriminance analysis, Clinton era

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## I. Introduction

The 1990s were probably the most prosperous decade in the history of the United States. Economic growth 1993/2000 was with 4.2 percent more than 0.5 percentage points higher than in 1960/1992, despite a smaller increase of labour force (on this and the following: Heilemann 2003). Employment expanded only by 1.7 percent vs. 1.9 percent, but inflation increased by merely 2.5 percent compared with 5.0 of the 30 years before. Real income *per capita* experienced a rise of 3.2 percent – 1 percentage point more than in the reference period. As a consequence the Federal deficit/GDP ratio came down from -1.6 percent to -1.2 percent. The balance is even more favourable if the “fabulous decade” (Blinder, Yellen 2001) is compared with the preceding decade and, most of all, if the dynamics within the era, the spurt in the second half of the 1990s is taken into account.

In the age of “diminished expectations”, the new prosperity in the 1990s surprised not only the general public and politics, but also economists. One reason for this may have been the fact that the long duration of the expansion was the result of many causes and their interaction, with good luck being not a small factor. More specific, the fabulous decade seems to have been the result of at least three, more or less related factors<sup>1</sup>: Firstly: the Clinton presidency had inherited considerable budget deficits that in the view of monetary policy required reduction. The new administration, backed by the electorate, followed a firm deficit targeted fiscal policy, and was in a sense rewarded by the Fed with low real interest rates for an unusual long time span, what meant a substantial stimulus for the economy. Secondly, deregulation and liberalisation of the 1980s and only gradually improving markets, assisted by a credible monetary policy and a surge in productivity as a (late) consequence of the high tech revolution helped to keep the inflation rate down. Finally, the 1998 currency crises in South America, South East Asia, and Russia required (and got) assistance by U.S. monetary policy, i. e. low interest rates. The currency crises led to a revaluation of the dollar what helped to keep inflation under control. This in return made it easier for monetary policy to keep interest rates down.

Today, students of the era might differ about the relative contribution of each of these factors but the list itself is hardly debated. However, in the late 1990s there were also other, less event and policy focussed views of the causes of the Clinton expansion and their consequences. Pointing at a number of reasons such as the IT-economy and its reduction of transaction cost, Weber (1997) and others were quick to declare the “end of the business cycle”. Such declarations were not new, they come up in the later parts of long upswings and the cycle had been stated “obsolete” in the late 1920s as well as in the late 1960s. Weber’s and others’ diagnosis found much opposition, em-

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<sup>1</sup> On this and the following see Blinder, Yellen 2001, Frankel, Orszag 2002, Heilemann 2002, 2003, Krueger, Solow (eds.) 2002, Council of Economic Advisors [CEA] 2005.

phasizing that only a few factors, notably its length, distinguished the present expansion from its predecessors (Zarnowitz 1999).

More in line with the facts than the new prophets of the “end of the business cycle”, most of all because of the 2001 recession along with its overcoming, appear the policy conclusions drawn from the fabulous decade celebrating the renaissance of macroeconomic policy, in particular of monetary policy (Blinder, Yellen 2001, pp. 83ff.). A view that finds much support when the economic record of the Clinton administration is analysed in terms of the partisan theory of political business cycles (Alesina, Roubini, Cohen 1997). In this view, as a Democratic administration it was very successful with respect to the goals of growth, employment, and inflation, however less successful than previous Democratic administrations (in the 1960s!); as to Government Deficit, the administration’s performance surpassed considerably this reference and those of Republic administrations (Heilemann 2003; for more detailed analyses of the macroeconomic performance and policy of the Clinton era see e.g., Krueger, Solow (eds.) 2002 and Frankel, Orszag (eds.) 2002).

Despite the necessity to analyse the 1990s from a current perspective, it seems equally essential to analyse the era also in a longer one: How different is the longest upswing in U.S. history from its predecessors? What were, next to its long duration, characteristics of the “fabulous decade”? Where there new elements – the New Economy? – shaping the cycle or were they already present before? To answer these questions, this paper analyses post WW II U.S. business cycles within the framework of a 4-phase classification scheme based on linear multivariate discriminant analysis (LMDA). This will allow statements about dominant macroeconomic influences on the cycle and its phases at least from a long run perspective. The scheme to be used has been developed by Meyer/Weinberg [M/W] in the mid 1970s (M/W 1975a, b) and updated and revised by the present authors (Heilemann/Müncch [H/M] 2002).

These are rather limited interests. The paper will *not* address questions such as reduced volatility on which much of past discussions of the topic centred (see e. g., McConnell, Perez-Quiros 2000, Romer 1999) nor that of dating and duration of the U.S. cycle (Hamilton 1989, Watson 1994). The reason for these omissions is that the interest in this part of the question is limited to GNP and that it is much linked to forecasting interests – did “leads” change? – while here more substantive, “structural” answers are sought after.

The paper proceeds as follows: The next section presents the M/W scheme and its results so far. Based on this scheme, section III examines the cyclical record of the Clinton era. Section IV summarizes the findings and draws some conclusions as to economic policy and further analysis of the U.S. cycle.

## II. The reference scheme

Classification of business cycles has a long tradition (Zarnowitz 1992, pp. 20ff.). The motives for this class of analyses are different. The still dominant reason seems to be the role of classification identifying indicators for forecasting purposes (Moore 1992). As to classification schemes themselves, the broadening of the cognitive base of business cycle analysis, the uncovering of “stylised facts” (Mitchell 1951) in the tradition of the historical school lost much of its previous interest with the advent of macroeconomic analysis and its causal orientation. For the U.S., the 9(5)-stage schemes of Burns/Mitchell (1947) and the 2-phase-scheme of the NBER (Zarnowitz 1992, pp. 217ff.) were for a long time the only schemes in use. In the early 1980s Eckstein/Sinai (1986) came up with a 5-phase cycle scheme that emphasised the role of credit crunches. Not long ago, Sichel (1994) presented a 3-phase scheme driven mainly by the inventory cycle. But none of these two schemes seems to have been widely used.

### 1. The original M/W business cycle scheme

In the mid 1970s John Meyer and Daniel Weinberg (M/W) (1975a, b, 1976) presented a new scheme to classify U.S. business cycles. Starting point was the NBER’s business cycle dating, a 2-stage cycle scheme. With the help of 20 variables they split it into a 4-phase scheme, entailing “Recovery”, “Demand-pull”, “Stagflation”, and “Recession”.<sup>2</sup> The variables and their weights used to separate the stages were selected by LMDA.<sup>3</sup> The resulting scheme (stages and variables) was successfully tested, not only for the then existing five U.S. post-WWII cycles, but also for pre-WW II cycles. In various updates and extensions by M/W and the present authors (for the U.S.: Heilemann 1982; for Germany: H/M 1999, 2002), the scheme proved to be rather successful, even though in the German case the length of the sample period had almost doubled.

M/W had suggested a 4-phase scheme, defined as follows (M/W 1975a, pp. 172f.): (1) *Recession*. A period of some duration in which total aggregate activity actually declines somewhat from previous peak levels and is reasonably widely diffused throughout the economy. (2) *Recovery*. The early expansion out of a recession and a state of economic affairs in which everything is “going well” – unemployment is declining, prices are relatively stable, productivity is rising, and total output is expanding. (3) *Demand-Pull-Inflation*. The classic inflationary situation, in which “too much money chases too few goods”. The forces of recovery are somehow allowed to achieve too much force or pull, with production forced up to capacity constraints, prices rising, rates

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<sup>2</sup> It is not difficult to develop a formal model based on the 20 (19) classifying variables of the M/W scheme to explain the four cycle stages; for such an exercise with the BEA’s index of leading indicators see de Leeuw 1992.

<sup>3</sup> For a detailed description see for example Brosius 1989, for a short outline see Heilemann, Münch 2002.

**Table 1**      **Classification of US business cycles into a 4-stage scheme 1948-5 to 2000-12**

Cycle <sup>1</sup>	Starting month of ...			
	Recovery	Demand-Pull	Stagflation	Recession
1 1948-5 to 1949-10 (18)	...	...	1948-5 (7)	1948-12 (11)
2 1949-11 to 1954-7 (57)	1949-11 (8)	1950-7 (6)	1951-1 (34)	1953-11 (9)
3 1954-8 to 1958-4 (45)	1954-8 (7)	1955-3 (30)	-	1957-9 (8)
4 1958-5 to 1961-1 (33)	1958-5 (25)	-	-	1960-6 (8)
5 1961-2 to 1970-11 (118)	1961-2 (51)	1965-5 (31)	1967-12 (25)	1970-1 (11)
6 1970-12 to 1975-3 (52)	1970-12 (25)	1973-1 (21)	-	1974-10 (6)
7 1975-4 to 1980-9 (66)	1975-4 (39)	1978-7 (12)	-	1979-7 (15)
8 1980-10 to 1982-12 (27)	1980-10 (6)	1981-4 (6)	-	1981-10 (15)
9 1983-1 to 1991-12 (107)	1983-1 (15)	1984-4 (43)	1987-11 (36)	1990-11 (13)
10 1991-12 to ... [2000-12]	1991-12 (73)	...	...	...
1948-5 to 2000-12 (632, Ø63)	285 (Ø 32)	149 (Ø 21)	102 (Ø 26)	96 (Ø 10)

Sources: Meyer/Weinberg (1948-5 to 1973-9), and authors' computations (1973-10 to 2000-12). – 1) Length of cycle/phase in parentheses.

of productivity improvement declining, etc. (4) *Stagflation*. A situation of stagnation at a high level of activity mixed with price inflation. The strains of Demand-Pull-Inflation perhaps recede and total monetary expansion diminishes. However, prices and wages continue to increase; perhaps because of catch-up effects due to sectoral imbalances created during the preceding Demand-Pull-Inflation, or because productivity does not improve enough to stabilise wage cost.

M/W had started with the NBER classification for the period February 1947 to September 1973. Their new stages, "Demand-Pull" and "Stagflation", were separated – from "Upswing" and "Recession", respectively – by "common economic sense" augmented by general knowledge of "recent business cycle history" (M/W 1975a, p. 175).<sup>4</sup> Following an *a priori* classification of the sample period, this period was then classified with the help of Bayesian multivariate discriminant functions containing 20 variables. Boundary months between cyclical stages were – in an iterative way – re-assigned according to the classifications of the LMDA. The resulting dating of the first 6 post-WW II cycles and their stages are shown in [Table 1](#). The variables used in the initial discriminant analysis were those (1) used by the NBER in its cycle chronic, (2) variables suggested by policy analysis and historical considerations, (3) variables that figured prominently in macroeconomic models or (4) that had been singled out as particularly sensi-

<sup>4</sup> For overviews over the various cycles, see e. g., Glasner (ed.) 1997, Zarnowitz 1992, pp. 20ff.

**Table 2 Average values of classifying variables  
1948-5 to 2000-12**

Variable		Stage <sup>1</sup>				
		Recovery	Demand- Pull	Stagflation	Recession	All
Real GNP <sup>2</sup>	a	4,09	4,51	4,39	-0,32	3,46
	b	3,84	4,51	4,39	-0,32	3,45
	c	3,96	4,05	3,37	-0,52	3,03
	d	3,66	4,05	3,37	-0,52	3,15
	e	3,47	-	-	-	-
Unemployment rate	a	6,49	5,33	4,04	6,56	5,70
	b	6,10	5,33	4,04	6,56	5,66
	c	7,28	6,35	5,43	7,60	6,78
	d	6,27	6,35	5,43	7,60	6,38
	e	5,21	-	-	-	-
Index of unit labor cost, private economy <sup>2</sup>	a	1,09	2,49	4,04	5,42	2,86
	b	0,70	2,49	4,04	5,42	2,38
	c	2,97	2,91	2,32	6,75	3,60
	d	1,35	2,91	2,32	6,75	2,54
	e	-0,02	-	-	-	-
Govt. surplus or deficit as per cent of GNP <sup>2</sup>	a	-1,29	-1,34	-0,73	-1,58	-1,25
	b	-1,26	-1,34	-0,73	-1,58	-1,24
	c	-2,94	-2,37	-2,36	-2,83	-2,65
	d	-1,96	-2,37	-2,36	-2,83	-2,21
	e	-0,77	-	-	-	-
GNP price deflator <sup>2</sup>	a	3,56	4,13	3,89	4,58	3,98
	b	2,96	4,13	3,89	4,58	3,63
	c	5,98	5,05	3,66	6,86	5,52
	d	3,73	5,05	3,66	6,86	4,45
	e	1,94	-	-	-	-
Prime rate <sup>3</sup>	a	0,34	1,19	0,88	-1,60	0,33
	b	0,30	1,19	0,88	-1,60	0,32
	c	0,38	1,22	0,30	-2,17	0,15
	d	0,30	1,22	0,30	-2,17	0,17
	e	0,50	-	-	-	-
Gross govt. expenditures <sup>2</sup>	a	4,68	7,16	16,30	6,94	8,07
	b	3,20	7,16	16,30	6,94	6,82
	c	7,56	7,63	3,28	10,34	7,51
	d	3,77	7,63	3,28	10,34	5,49
	e	0,81	-	-	-	-
Money supply M2 <sup>2</sup>	a	9,03	7,05	5,45	5,31	7,08
	b	7,16	7,05	5,45	5,31	6,58
	c	11,48	8,09	5,02	6,95	8,57
	d	7,36	8,09	5,02	6,95	7,24
	e	4,43	-	-	-	-

Table 2, continued

Variable		Stage <sup>1</sup>				
		Recovery	Demand-Pull	Stagflation	Recession	All
Money supply M1 <sup>2</sup>	a	4,93	6,35	4,05	3,40	4,88
	b	4,20	6,35	4,05	3,40	4,56
	c	7,35	9,00	3,00	5,94	6,99
	d	4,92	9,00	3,00	5,94	5,80
	e	1,80	-	-	-	-
Net exports as per cent of GNP	a	0,12	-0,01	0,17	0,41	0,15
	b	-0,30	-0,01	0,17	0,41	-0,05
	c	-0,08	-0,38	-0,50	0,01	-0,22
	d	-0,59	-0,38	-0,50	0,01	-0,45
	e	-1,09	-	-	-	-
Wholesale price index, industrial <sup>2</sup> commodities only	a	2,70	4,42	3,73	5,43	3,89
	b	2,29	4,42	3,73	5,43	3,50
	c	5,44	5,43	4,03	9,71	6,06
	d	3,30	5,43	4,03	9,71	4,72
	e	1,77	-	-	-	-
Compensation per man-hour <sup>2</sup>	a	4,71	5,42	5,46	3,89	4,91
	b	4,99	5,42	5,46	3,89	5,00
	c	4,88	4,84	5,09	4,90	4,90
	d	5,19	4,84	5,09	4,90	5,06
	e	5,42	-	-	-	-
Average yields on corporate bonds (Moody's) <sup>3</sup>	a	0,18	0,68	0,34	-0,45	0,24
	b	0,07	0,68	0,34	-0,45	0,18
	c	0,07	0,40	-0,25	-0,31	0,06
	d	-0,04	0,40	-0,25	-0,31	0,00
	e	-0,08-	-	-	-	-
Consumer price index <sup>2</sup>	a	3,23	4,21	4,64	5,59	4,22
	b	3,04	4,21	4,64	5,59	3,96
	c	5,69	5,90	4,67	8,79	6,21
	d	4,02	5,90	4,67	8,79	5,16
	e	2,67	-	-	-	-
Consumer price index, food only <sup>2</sup>	a	2,52	5,15	5,12	3,92	4,04
	b	2,45	5,15	5,12	3,92	3,74
	c	5,07	7,82	5,15	6,19	6,19
	d	3,53	7,82	5,15	6,19	5,03
	e	2,48	-	-	-	-
Output per man-hour <sup>2</sup>	a	3,53	1,99	1,77	0,73	2,23
	b	3,00	1,99	1,77	0,73	2,22
	c	3,11	1,39	1,09	-0,14	1,63
	d	2,57	1,39	1,09	-0,14	1,78
	e	1,95	-	-	-	-

**Table 2, continued**

Variable		Stage <sup>1</sup>				
		Recovery	Demand-Pull	Stagflation	Recession	All
N.Y. Stock Exchange composite price index <sup>2</sup>	a	1,04	0,24	1,05	0,24	0,66
	b	1,05	0,24	0,20	1,11	0,73
	c	0,89	-0,04	0,25	1,85	0,69
	d	0,98	-0,04	0,25	1,85	0,80
	e	1,08	-	-	-	-
Consumer price index, all commodities <sup>2</sup> except food	a	3,48	3,91	4,54	6,13	4,30
	b	3,18	3,91	4,54	6,13	4,02
	c	5,92	5,33	4,57	9,36	6,20
	d	4,11	5,33	4,57	9,36	5,15
	e	2,67	-	-	-	-
Wholesale price index <sup>2</sup>	a	2,36	4,61	3,68	4,20	3,60
	b	2,02	4,61	3,68	4,20	3,23
	c	5,04	6,07	4,12	7,85	5,79
	d	3,02	6,07	4,12	7,85	4,48
	e	1,60	-	-	-	-

Authors' computations. – 1) a: Results for period a: 1948-5 to 1991-11, b: 1948-5 to 2000-12, c: 1970-12 to 1991-11, d: 1970-12 to 2000-12, e: 1991-12 to 2000-12. – 2) Per cent changes are against previous year. – 3) Per cent changes against previous month.

tive cyclical indicators (M/W 1975a, p. 176). However, whilst the NBER business cycle dating is based on the levels of variables (see e.g., Zarnowitz 1992, p. 284), classification procedures, like the present one, have to be based on more or less stationary data to deliver reasonable results.<sup>5</sup> Hence, all variables with an underlying trend have to be transformed into changes or differences. The average values of the classifying variables in the 4 stages “more or less confirm prior expectations in different cyclical stages” (M/W 1975a, p. 178, see also [Table 2](#), line a).

Eigenvalues and cumulative proportions of “explained” dispersion led M/W to find two canonical discriminant functions as sufficient and allowing them a straightforward interpretation of results. The first discriminant function differentiates by Unemployment, changes of the interest rate, productivity and various price deflators, thus separating recessions and recoveries from the two “inflation” periods. “Specifically, high unemployment rates, good productivity gains, negative changes in corporate bond rates, and small to negative price changes will yield a high negative score on this index; opposite conditions will register positively” (M/W 1975a, p. 178). The second function apparently

<sup>5</sup> Data sources are reported in M/W 1975a.



adds only a little to this differentiation. Mainly the course of interest rates helps somewhat in separating the “growth” stages (Recovery, Demand-Pull) from the two “no-growth” periods.

In the eyes of M/W classification results within and outside the sample were satisfying and promising (M/W 1975a, pp. 187ff.). The error rate amounted to 9.4 percent within the sample period and to 40 percent outside the sample period 1973-10 to 1974-12: But also for more conventional analyses, the latter time span presented a rather ambivalent episode, oscillating between “slumpflation” and “inflationary recession (M/W 1975b, p. 12), later to be labelled as “stagflation”.

## 2. Updating and modifying the M/W scheme to 2000

Before updating the 30 years old scheme we tried to reproduce M/W’s results. The details and results of this and of the following update have been described in detail elsewhere (H/M 2002), thus we can be brief on this here. All in all, the modifications made were moderate. The most important changes were, first, the conversion of the variables employed (listed in Table 2) into change rates against previous year; second, the extension of the number of discriminant functions to three, although this makes interpretation of their parameters more difficult; third, Money GDP was released from the list of classifying variables.

The classification procedure for the period 1973 to 2000 followed the iterative approach chosen by M/W (1975a).<sup>6</sup> It started, again, with splitting the NBER 2-phase classification of this period into Recovery/Demand-Pull-Inflation and Stagflation/Recession. For data reasons, extremely short “a priori” Demand-Pull and Stagflation phases, but also because we were primarily interested in the Clinton era, the analysis did not include the 2001 recession and the following recovery.

The *a priori* classification of the new sample period was modified according to the classification results of LMDA for the various sample periods. Dating and classifications of the 4 cycles after 1973 are displayed in Table 1. Even after the modifications they still meet the classification dates by the NBER and also those by Hamilton (1989, Sichel 1994). As could already be guessed from previous results and from history, since 1973 Stagflation is identified only in *one* of the five new cycles.

The average values for the classifying variables (Table 2, line b) are in line with the current understanding of the stylised facts of the U.S. cycle. When compared with averages of the M/W-sample (1948-5 to 1973-9), the levels (of rates of change!) of some variables are different, but their inter-phase relationships are still very similar to those of M/W.

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<sup>6</sup> The computations were performed with the Discriminant Analysis routine of SPSS, Version 10.

**Table 3 Estimation results for the standardized canonical discriminant functions<sup>1</sup> 1948-5 to 2000-12**

Variable	Coefficients of function1			F-Value to enter	
	1	2	3		
Real GNP <sup>2</sup>	a	-0,08	0,68	0,34	108,0
	b	-0,51	0,50	0,13	123,8
	c	0,32	0,34	-0,22	70,4
	d	-0,74	-0,04	0,04	92,7
Unemployment rate	a	1,36	-0,12	0,42	88,9
	b	1,21	0,66	0,38	75,9
	c	0,20	-0,60	-0,27	34,2
	d	0,85	0,91	1,84	20,6
Index of unit labor cost. private economy <sup>2</sup>	a	0,16	-0,18	0,63	34,6
	b	-0,03	-0,14	0,30	52,5
	C	0,06	-0,66	-0,49	14,7
	d	0,20	0,08	0,03	27,9
Govt. surplus or deficit as per cent of GNP <sup>2</sup>	a	0,89	-0,05	-0,04	4,7
	b	0,78	0,20	0,30	4,1
	c	-0,77	-0,57	0,15	3,7
	d	0,96	0,92	2,10	3,6
GNP price deflator <sup>2</sup>	a	0,14	0,56	-0,27	3,6
	b	-0,08	0,41	0,17	15,4
	c	-1,07	1,93	0,76	19,1
	d	-1,14	0,81	-1,10	27,9
Prime rate <sup>3</sup>	a	0,03	0,14	-0,10	11,1
	b	-0,02	0,16	-0,10	12,7
	c	-0,14	0,15	0,12	4,8
	d	-0,09	0,22	0,04	6,4
Gross govt. expenditures <sup>2</sup>	a	-0,31	-0,10	-0,69	20,9
	b	-0,06	-0,22	-0,38	34,8
	c	0,03	-0,05	-0,08	25,6
	d	0,10	-0,80	0,10	44,9
Money supply M2 <sup>2</sup>	a	0,52	0,54	-0,49	63,3
	b	-0,17	0,18	0,09	15,2
	c	-0,06	0,58	0,57	139,2
	d	0,13	-0,06	-0,01	7,1
Money supply M1 <sup>2</sup>	a	-0,04	-0,16	1,39	19,4
	b	-0,22	-0,09	0,72	15,3
	c	1,45	-0,27	-0,84	52,9
	d	0,03	-0,44	0,82	25,5
Net exports as per cent of GNP	a	0,30	-0,05	0,68	9,0
	b	-0,14	-0,37	0,45	21,2
	c	2,09	-0,73	0,18	40,8
	d	0,48	0,28	0,53	8,1

Table 3, continued

Variable		Coefficients of function <sup>1</sup>			F-Value to enter
		1	2	3	
Wholesale price index, industrial <sup>2</sup> commodities only	A	0,32	1,29	0,35	6,1
	B	-0,48	0,91	0,57	12,2
	C	1,28	1,47	-0,93	8,0
	D	-1,38	0,43	1,47	19,1
Compensation per man-hour <sup>2</sup>	A	0,32	1,29	0,35	19,4
	B	-0,30	0,0	-0,02	21,1
	C	-0,95	0,09	1,17	9,8
	D	-0,07	0,14	0,01	16,2
Average yields on corporate bonds (Moody's) <sup>2</sup>	A	-0,02	0,16	0,06	5,2
	B	-0,07	0,12	0,06	5,5
	C	-0,11	0,04	-0,04	0,9
	D	-0,06	0,10	-0,01	1,0
Consumer price index <sup>2</sup>	A	2,23	0,54	2,97	11,3
	B	0,62	0,90	0,16	20,2
	C	0,91	-2,24	-3,55	17,3
	D	0,03	-0,22	0,59	43,4
Consumer price index. food only <sup>2</sup>	A	-1,25	0,58	-1,29	12,7
	B	-0,88	-0,06	-0,17	20,8
	C	-0,70	1,69	0,00	8,3
	D	-0,87	-1,13	0,37	33,4
Output per man-hour <sup>2</sup>	A	0,37	0,01	-0,54	60,8
	B	0,32	0,18	-0,59	48,1
	C	-0,60	0,57	0,05	59,3
	D	-0,19	0,46	0,31	58,7
N.Y. Stock Exchange composite price index <sup>2</sup>	A	0,01	0,02	-0,12	2,6
	B	0,04	0,02	-0,06	3,3
	C	0,00	-0,01	0,10	2,8
	D	0,12	0,14	0,11	3,5
Consumer price index, all commodities <sup>2</sup> except food	A	-2,10	-1,44	-3,44	15,6
	B	-0,16	-1,76	-1,38	26,0
	C	-0,69	0,93	3,49	24,5
	D	1,03	-0,21	-1,06	47,3
Wholesale price index <sup>2</sup>	A	0,27	-1,62	0,81	5,8
	B	0,94	-0,69	-0,46	11,9
	C	-0,95	-1,96	1,21	4,1
	D	1,78	0,18	-0,70	16,2

**Table 3, continued**

		Eigenvalues								
Function		Eigenvalue	% of variance	cumulative %	Canonical correlation	after function	Wilks' $\lambda$	$\chi^2$	df	Significance
a	1	2.05	58.2	58.2	0.8	1	0.1	1107.2	57	0.00
	2	1.13	32.0	90.2	0.7	2	0.3	537.2	36	0.00
	3	0.35	9.8	100.0	0.5		0.7	151.3	17	0.00
b	1	1.3	56.0	56.0	0.8	1	0.2	1018.3	57	0.00
	2	0.9	36.0	92.0	0.7	2	0.5	492.5	36	0.00
	3	0.2	8.0	100.0	0.4		0.8	108.0	17	0.00
c	1	3.6	44.6	44.6	0.9	1	0.0	914.9	57	0.00
	2	2.8	35.0	79.7	0.9	2	0.1	550.9	36	0.00
	3	1.6	20.3	100.0	0.8		0.4	231.2	17	0.00
d	1	1.6	48.3	48.3	0.8	1	0.1	747.1	57	0.00
	2	1.3	38.1	86.3	0.7	2	0.3	414.3	36	0.00
	3	0.5	13.7	100.0	0.6		0.7	130.0	17	0.00

Authors' computations. Eigenvalue: eigenvalues of the discriminant functions in declining order. % of variance: % importance of the discriminant functions. cum %: cumulative importance in relative terms. df: degrees of freedom. For a detailed description of the statistics see Brosius 1989. – 1) a: Results for period 1948-5 to 1991-11, b: 1948-5 to 2000-12, c: 1970-12 to 1991-11, d: 1970-12 to 2000-12. – 2) Percent changes against previous year. – 3) Percent changes against previous month.

The newly estimated parameters and their influence differ considerably from those for the earlier periods (Table 3). This is in particular the case for Unemployment and Real GNP. More or less unchanged parameters and weights (F-value to enter) are revealed only for Gross Government Expenditure, M1, Compensation per man-hour, and Output per man-hour. But most of them are only of minor importance within the functions.

The cyclical characters became more evenly distributed; the weight of the majority of variables has been reduced. This is in particular the case for the various measures of inflation. Only the importance of Real GNP and of Net Exports – indicators of economic activity – has strengthened. Although economic interpretation of these results must be careful (see also e.g., Weihs, Sondhaus 2000) – the results seem to underline that, with the exception of the Unemployment rate, inflation lost much of its discriminating power.

The “explained variance” (Table 3) for the first discriminant function – discriminating between Recovery and Demand-Pull – is reduced to 50 percent (from nearly 70 percent), corresponding with a doubling of this ratio in the second function from 20 to more than 35 percent, which confirms the picture rendered by the F-values.

The total error rate of classifications increases for the new sample period to nearly 15 percent, that is somewhat better than what has been recorded here for the two old M/W-samples, 19 percent and 25 percent, respectively.

The lengths of cycles and phases have been rather stable, compared to the old sample and to the NBER cycle dating. The average duration of full cycles is still 62

months (NBER: 63), that of *Recoveries* 22 months (M/W: 23), Demand-Pull-Inflation 21 (22) months, Stagflations 32 (30) months and of Recessions 9 (11) months.

### III. The Clinton expansion

As laid out before, the cyclical characteristics of the Clinton expansion deserve interest for a number of reasons. This paper concentrates on three questions. First, it asks in which way the importance of the classifying variables changed between cycles or within their 4 phases; second, how well do the new results explain the pre-1991-12 experience. Based on these results, we shortly examine the cyclical homogeneity of the Clinton expansion. Size and direction of these changes depend, of course, on the cyclical experience or the sample they are compared with. The tables report comparisons with a longer sample (1948-5/1991-11) and with a shorter one (1970-12/1991-11); most of the text refers only to the latter.

According to the “F-values to enter”, the most important new characteristic of the Clinton expansion was the reduction of the previous overwhelming importance of M2 from rank (1) to rank (15). It was “replaced” by Real GNP, which had held rank (2) before. This may reflect the fact that in the 1980s the Fed had given up targeting the rate of growth of money and had returned to its former policy of controlling interest rates. Considerable gains in importance were to register for the various measures of Inflation<sup>7</sup>, for Government Expenditure ((4) vs. (7)) and for Unit Labor Cost ((7) vs. (11)). Sizeable reductions of importance are found also for M1 ((9) vs. (4)), Net Exports ((14) vs. (5)), Unemployment ((10) vs. (6)). The importance of the Prime Rate remained rather low, but this may be due to the fact that it is the nominal rate. More difficult to explain is why the cyclical meaning of Compensation Per Man Hour, the GNP/Government Deficit Ratio and the role of Average Yields on Corporate Bonds (Moody’s) and of the New York Stock Exchange composite price index did not change. But, again, the latter two variables are the two least important classifiers anyway. Therefore the results presented here do not confirm the findings of the recent report of the CEA (2005, pp. 59f.) of an increased role of the financial markets for the behaviour of private investment (“financial accelerator”). Not at least because this would require a causal analysis, which is beyond the methodical possibilities and intensions of this paper. However, our results seem to be much in line with the CEA’s findings about “Expansions past and present” (CEA 2005, pp. 49ff.), in particular as to the role of monetary and fiscal policy.

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<sup>7</sup> It should, however, be borne in mind that the measurement of inflation (and of real GDP) underwent considerable changes. Revisions in the official statistics, however, did go back only to the beginnings of the 1990s.

Despite the fact that the new sample consists only of data a priori classified as Recovery, of course, coefficients of all three functions were affected. While those of function 1 (separating periods of upswing from those of downswing) may reflect the changes signalled by the F-values, the changes in functions 2 and 3 are more difficult to understand. Interpretations of changing significance of variables are, however, risky not only for the methodical reasons mentioned above but also because of the different explanatory power of the three functions in the various samples.

**Table 4**      **Classification results for different samples**  
**1970-12 to 2000-12**

Actual group	No. of cases	Predicted group membership			
		Recovery	Demand-Pull	Stagflation	Recession
1970-12 to 1991-11					
Recovery	85	68 80.0%	14 16.5%	0 .0%	3 3.5%
Demand-Pull	82	8 9.8%	68 82.9%	3 3.7%	3 3.7%
Stagflation	36	0 .0%	0 .0%	35 97.2%	1 2.8%
Recession	49	0 .0%	0 .0%	0 .0%	49 100.0%
<i>Total error rate: 12.7%</i>					
1970-12 to 2000-12					
Recovery	194	160 82.5%	18 9.3%	8 4.1%	8 4.1%
Demand-Pull	82	7 8.5%	67 81.7%	6 7.3%	2 2.4%
Stagflation	36	0 .0%	0 .0%	36 100.0%	0 .0%
Recession	49	2 4.1%	0 .0%	1 2.0%	46 93.9%
<i>Total error rate: 14.4%</i>					
Authors' computations					

As to the overall perspective, the inclusion of the Clinton expansion improves considerably the explanatory power of the first and of the second discriminant functions (Table 3). The classification results for the new sample do not reflect this improvement since the total error rate increases from 12.7 percent to 14.4 percent (Table 4). In a relative perspective, most of these errors occur by classifying the Recovery as Demand-Pull Inflation; effects on previous classifications are small and equally distributed

upon all phases. The cyclical innovation resulting from the Clinton expansion is much more remarkable when seen in the light of the explanatory power *outside* sample periods. The longer sample classifies about 25 percent of the period 1991-2 to 2000-12 as Demand-Pull, about 68 percent as Stagflation, 4 percent as Recession, and only 3 percent correctly (Recovery). The results for the shorter sample are even more “disappointing” (0/0/73/27 percent) and thus signal even more strongly structural shifts in the cycle picture. (Table 5, Appendix, presents a detailed picture of the classification record for each period of the Clinton expansion. Noteworthy there is not only the surprisingly high correspondence between the two samples including the Clinton era but also the considerable discrepancy between the two long samples.) However, the corroborative role of this test should, not only for logical reasons, not be overrated: the classificatory power of the scheme outside the sample period usually is not very high. This was already an experience made by M/W (1975a, b) and in a number of systematic “leave one cycle out”-tests by H/M (2002).

But these misclassifications bear also more pleasant lessons. Within the sample period, they mirror very well the difficult time span around 1994/95 for the economy and for monetary policy, difficulties that the three other samples encounter, too (Table 5, Appendix). Monetary policy felt that it had to react on rising inflation and, “as usual” would have sent the economy into recession (Blinder, Yellen 2001, pp. 25-33, Heilemann 2003). The classifications with the two longer samples illustrate these difficulties very well, too (Table 4).

#### **IV. Summary and conclusions**

This paper finds that the long expansion of the Clinton era changed major characteristics of post 1970 U.S. business cycles. More modestly expressed, it shows some substantive attributes that distinguish it from preceding upswings or Recoveries. With the help of linear multivariate discriminant analysis (LMDA) using 19 macroeconomic and financial variables to define Recovery, Demand-Pull Inflation, Stagflation, and Recessions developed by Meyer/Weinberg in the early 1970s, it is shown that in the Clinton expansion M2, Net Exports, and Unemployment lost much of their classificatory power, while that of Real GNP, various measures of inflation, Government Expenditures, and Unit Labor Cost increased. This confirms those interpretations of the Clinton era that see low inflation, a forbearing monetary policy, a deficit targeted fiscal policy, and a productivity jump as its keystones. Surprisingly, the results do not see a changed role for other classifying variables such as Compensation per Man Hour, Government Deficit/GNP ratio, Bond yields, or the stock market. The results throw some doubt on seeing the Clinton era as a continuous Recovery. Around 1995 a very short Recession might have happened. All in all, the results seem to reflect an increased role of financial variables. However, within the methodical framework of this paper it is difficult to link this to “new policy” or to a “new behaviour” of the investment sector and the “financial accelerator” (CEA 2005, pp. 59).

While re-estimations and up-dates of the M/W scheme generally confirmed it, the results clearly reveal that, first, for the post 1973 period a 3-phase scheme might deliver a better description than the 4-phase scheme. This fits to the proposal of a 3-phase scheme based on real GDP changes presented by Sichel (1994), but contradicts the idea of a multivariate based 5-phase cycle suggested by Eckstein/Sinai (1986); second, once again the results for the longer and the shorter samples make clear, that the question of changes of cyclical characteristics depends to a large degree on the standard with which a new experience is compared. In the present case, the Clinton expansion seems to be outstanding in comparison with those of the 1970s and, probably even more with those of the 1980s. When compared with the experience of the 1950s and 1960s, the innovation is much smaller. – From a methodical perspective, the results or at least the classification approach in general offers a promising complement to the studies of changes of the business cycle mentioned above. Eventhough such a structural approach is not new, actually it is the starting point of the Burns/Mitchell approach, but it has not found much application in the recent past.

Will the changes of cycle characteristics detected here be of a transitional or of permanent nature? To answer this question, LMDA would require at least another full cycle. That is, hélas, the start of another recession. So far, important characteristics of the 1990s such as the forbearing monetary/interest rate policy, productivity, compensation, and low inflation seem to have played similar roles as in the “fabulous decade”, while the roles of Government deficit/GDP ratio, the growth of Gross government expenditure, and of Net Exports differed considerably. Certainly, some of these characteristics demand considerable correction in the near future. It is clear that this will substantially affect the economy. Whether this also means a repeal of the changes of the characteristics of the U. S. portrayed here is more difficult to foresee. The interpretation of the results presented in this paper would suggest that these changes are of transitory nature.

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## Appendix

**Table 5**      **Classifications for the Clinton Era 1991-11 to 2000-12, various samples**

Year	Month	Phase	Classification			
			a: 1948-5 to 1991-11	b: 1948-5 to 2000-12	c: 1970-12 to 1991-11	d: 1970-12 to 2000-12
1991	Nov.	Recession	-	-	-	Recovery
	Dec.	Recovery	Recession	-	Recession	
1992	Jan.	Recovery	Recession	-	Recession	-
	Febr.	Recovery	Dem. Pull	-	Recession	-
	March	Recovery	Dem. Pull	-	Recession	-
	April	Recovery	Dem. Pull	-	Recession	-
	May	Recovery	Dem. Pull	-	Recession	-
	June	Recovery	Recession	-	Recession	-
	July	Recovery	Recession	-	Recession	-
	August	Recovery	Dem. Pull	-	Recession	-
	Sept.	Recovery	Dem. Pull	Dem. Pull	Recession	-
	Oct.	Recovery	Dem. Pull	-	Recession	-
	Nov.	Recovery	Dem. Pull	-	Recession	-
	Dec.	Recovery	Dem. Pull	-	Recession	-
1993	Jan.	Recovery	Dem. Pull	Dem. Pull	Recession	-
	Febr.	Recovery	Dem. Pull	Dem. Pull	Recession	-
	March	Recovery	Dem. Pull	Dem. Pull	Recession	-
	April	Recovery	Dem. Pull	Dem. Pull	Recession	-
	May	Recovery	Dem. Pull	Dem. Pull	Recession	-
	June	Recovery	Dem. Pull	Dem. Pull	Recession	-
	July	Recovery	Dem. Pull	Dem. Pull	Recession	-
	August	Recovery	Dem. Pull	Dem. Pull	Recession	-
	Sept.	Recovery	Dem. Pull	Dem. Pull	Recession	-
	Oct.	Recovery	Dem. Pull	Dem. Pull	Recession	-
	Nov.	Recovery	Dem. Pull	Dem. Pull	Recession	-
	Dec.	Recovery	Dem. Pull	Dem. Pull	Recession	-
1994	Jan.	Recovery	Dem. Pull	-	Recession	-
	Febr.	Recovery	Dem. Pull	-	Recession	-
	March	Recovery	Dem. Pull	Dem. Pull	Recession	-
	April	Recovery	Dem. Pull	-	Recession	-
	May	Recovery	Dem. Pull	-	Stagflation	-
	June	Recovery	Dem. Pull	-	Stagflation	-
	July	Recovery	Dem. Pull	-	Stagflation	-
	August	Recovery	Stagflation	-	Stagflation	-
	Sept.	Recovery	Stagflation	-	Stagflation	-
	Oct.	Recovery	Stagflation	-	Stagflation	Stagflation
	Nov.	Recovery	Stagflation	-	Stagflation	-

Table 5, continued

Year	Month	Phase	Classification			
			a: 1948-5 to 1991-11	b: 1948-5 to 2000-12	c: 1970-12 to 1991-11	d: 1970-12 to 2000-12
1995	Dec.	Recovery	Stagflation	-	Stagflation	Stagflation
	Jan.	Recovery	Stagflation	-	Stagflation	Stagflation
	Febr.	Recovery	Stagflation	-	Stagflation	Stagflation
	March	Recovery	Stagflation	-	Stagflation	Stagflation
	April	Recovery	Stagflation	-	Stagflation	-
	May	Recovery	Stagflation	-	Stagflation	-
	June	Recovery	Stagflation	-	Stagflation	-
	July	Recovery	Stagflation	-	Stagflation	-
	August	Recovery	Stagflation	-	Stagflation	-
	Sept.	Recovery	Stagflation	-	Stagflation	-
	Oct.	Recovery	Stagflation	-	Stagflation	-
	Nov.	Recovery	Stagflation	-	Stagflation	-
1996	Dec.	Recovery	Stagflation	-	Stagflation	-
	Jan.	Recovery	Stagflation	-	Stagflation	-
	Febr.	Recovery	Stagflation	-	Stagflation	-
	March	Recovery	Stagflation	-	Stagflation	-
	April	Recovery	Stagflation	-	Stagflation	-
	May	Recovery	Stagflation	-	Stagflation	-
	June	Recovery	Stagflation	-	Stagflation	-
	July	Recovery	Stagflation	-	Stagflation	-
	August	Recovery	Stagflation	-	Stagflation	-
	Sept.	Recovery	Stagflation	-	Stagflation	-
	Oct.	Recovery	Stagflation	-	Stagflation	-
	Nov.	Recovery	Stagflation	-	Stagflation	-
1997	Dec.	Recovery	Stagflation	-	Stagflation	-
	Jan.	Recovery	Stagflation	-	Stagflation	-
	Febr.	Recovery	Stagflation	-	Stagflation	-
	March	Recovery	Stagflation	-	Stagflation	-
	April	Recovery	Stagflation	-	Stagflation	-
	May	Recovery	Stagflation	-	Stagflation	-
	June	Recovery	Stagflation	-	Stagflation	-
	July	Recovery	Stagflation	-	Stagflation	-
	August	Recovery	Stagflation	-	Stagflation	-
	Sept.	Recovery	Stagflation	-	Stagflation	-
	Oct.	Recovery	Stagflation	-	Stagflation	-
	Nov.	Recovery	Stagflation	-	Stagflation	-
1998	Dec.	Recovery	-	-	Stagflation	-
	Jan.	Recovery	Stagflation	-	Stagflation	-
	Febr.	Recovery	Stagflation	-	Stagflation	-
	March	Recovery	-	-	Stagflation	-
	April	Recovery	Stagflation	-	Stagflation	-

Table 5, continued

Year	Month	Phase	Classification			
			a: 1948-5 to 1991-11	b: 1948-5 to 2000-12	c: 1970-12 to 1991-11	d: 1970-12 to 2000-12
1999	May	Recovery	Stagflation	-	Stagflation	-
	June	Recovery	Stagflation	-	Stagflation	-
	July	Recovery	Stagflation	-	Stagflation	-
	August	Recovery	Stagflation	-	Stagflation	-
	Sept.	Recovery	Stagflation	-	Stagflation	-
	Oct.	Recovery	Stagflation	-	Stagflation	-
	Nov.	Recovery	Stagflation	-	Stagflation	-
	Dec.	Recovery	Stagflation	-	Stagflation	-
	Jan.	Recovery	Stagflation	-	Stagflation	-
	Febr.	Recovery	-	-	Stagflation	-
	March	Recovery	Stagflation	-	Stagflation	-
	April	Recovery	Stagflation	-	Stagflation	-
2000	May	Recovery	Stagflation	-	Stagflation	-
	June	Recovery	Stagflation	-	Stagflation	-
	July	Recovery	Stagflation	-	Stagflation	-
	August	Recovery	Stagflation	-	Stagflation	-
	Sept.	Recovery	Stagflation	-	Stagflation	-
	Oct.	Recovery	Stagflation	-	Stagflation	-
	Nov.	Recovery	Stagflation	-	Stagflation	-
	Dec.	Recovery	Stagflation	-	Stagflation	-
	Jan.	Recovery	Stagflation	-	Stagflation	-
	Febr.	Recovery	Stagflation	-	Stagflation	-
	March	Recovery	Stagflation	-	Stagflation	-
	April	Recovery	Stagflation	-	Stagflation	-
May	Recovery	Stagflation	-	Stagflation	-	
June	Recovery	Stagflation	-	Stagflation	-	
July	Recovery	Stagflation	-	Stagflation	-	
August	Recovery	Stagflation	-	Stagflation	-	
Sept.	Recovery	Stagflation	-	Stagflation	-	
Oct.	Recovery	Stagflation	-	Stagflation	-	
Nov.	Recovery	Stagflation	-	Stagflation	-	
Dec.	Recovery	Stagflation	-	Stagflation	-	

Authors' computations. (-): predicted and prior classification are the same.