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The New York City Budget: Anatomy of a Fiscal Crisis

by Rona B. Stein

This article is designed to provide background information on some of the key developments that underlie New York City's recent budgetary difficulties. Its focus is threefold. In particular, the city budget is examined to identify those expenditure categories which are large and which have grown rapidly, especially in recent years. Second, per capita spending by New York City is compared with that of other large municipalities in this country to gain perspective on the total package and costs of services provided by the city. Analysis of some of the major economic, demographic, and political factors which have contributed to the budget imbalance, and therefore to the city's ongoing difficulties, constitutes the third principal area of focus. While much of the information presented in this article is available elsewhere, the objective here is to pull a wide variety of statistics into a coherent framework to facilitate informed discussion of the city's difficulties.

It should be emphasized at the outset that only some aspects of New York City's complicated financial situation are analyzed here. The article does consider the budgetary impact both of demographic changes, which led to a relatively heavy concentration of the low-income aged in the city, and of nationwide recessions and inflation. The fact that the city voluntarily assumed responsibility for supporting services that are not provided by most other municipal governments is also considered. On the other hand, while various municipal inefficiencies, including dubious accounting practices and poor budgetary control procedures, undoubtedly played a role in precipitating the crisis, this article does not delve into these topics.

In the first section of the article, the expense budget is divided into its major components to identify areas of rapid growth and to suggest factors which may have contributed to this expansion. The second section takes up the topic of "controllable" and "uncontrollable" spending, while the third examines city outlays relative to spending by other municipalities. Brief sections on the city's revenue trends and on certain previously proposed remedies for some of the city's fiscal ills follow, and concluding comments are contained in the final section.

Composition of city spending

To examine the expenditure patterns which existed at the onset of the fiscal crisis, it is necessary to analyze the budget prior to austerity measures taken either by the city administration alone or in conjunction with the Municipal Assistance Corporation (MAC) or the Emergency Financial Control Board. For this reason the major expenditures outlined in Table 1 (and all other calculations unless otherwise indicated) are based on the authorized July 1975-June 1976 expense budget.[1]

The largest single area of expenditure, accounting for 22 percent of the total, is for the Department of

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[1] The authorized budget was used in this analysis because it contains detailed expenditure breakdowns for each department or agency. However, since revenues and expenditures can never be forecast with perfect accuracy, budget figures change as the fiscal year progresses. In fiscal 1975-76, the authorized expense budget was almost $700 million less than actual outlays. Although such discrepancies change the amounts of individual appropriations, they do not substantially affect the relative proportions of the various expense categories.

New York City's Budgeted Expenditures

Fiscal year 1975-76

Expenditure category	Millions of dollars	Percentage of total budget
Department of Social Services ...	2,937.5	22.2
Board of Education	2,468.0	18.7
Health Services Administration ...	1,165.3	8.8
Police Department	943.7	7.1
Board of Higher Education	597.9	4.5
Environmental Protection	495.1	3.7
Payments to charitable institutions.	586.3	4.4
Fire Department	410.5	3.1
Human Resources Program	164.9	1.2
Debt service	1,885.6	14.2
Other	1,577.7	11.9
Total expenditures	13,232.5	100.0
Less: Capital budget and special funds used to finance operating expenditures	1,145.0	
Expense budget	12,087.5	

Note: Because of rounding, figures do not necessarily
add to totals.
Source: New York City Expense Budget, 1975-76.

Social Services. Even this amount, however, does not cover the full extent of welfare costs. The separate allocation which is made for the Human Resources Program[2] must be added to this sum, raising total welfare expenditures in New York City to more than $3.1 billion, about three fourths of which are Federally or state funded. The second largest allotment is for total educational services, i.e., for the Board of Education as well as for the Board of Higher Education. More than $3 billion goes for education. The Health Services Administration, which includes the Health and Hospitals Corporation, is the third major area of expenditure, receiving 8.8 percent of budget funds. Together, welfare, education, and health services account for approximately 55 percent of New York's budget.

Over the long run, education and health services have each constituted a fairly constant share of the total budget, but the relative allotment for social service expenditures has grown significantly. Expenditures in this category are approximately fourteen times what they were in fiscal 1956, while the budget as a whole is about seven times larger. It is this area which has been responsible for the greatest part of the explosion in city spending. (The proportionate alloca-

[2] The Human Resources Program provides direction, budgeting, and coordination of city policy for community action, manpower and career development, social and youth services, public assistance, and planning for and implementation of early childhood services.

tions to social services, education, health services, pensions, and debt service are illustrated in the chart.)

The actual allocations to the major budget areas in selected fiscal years are shown in Table 2. The extraordinary increases in social service and higher education expenditures stand in sharp contrast to the more moderate growth in other categories. The dramatic increase in the total welfare case load has been a major cause of the growth in social service expenditure. The number of persons on public assistance rose from 339,000 in November 1961 to 998,000 in November 1975; in real terms, expenditures rose just as precipitously.[3]

In part, the exceedingly large social service allocations reflect demographic changes in the city's population. For example, services for the aged, a group which tends to have the lowest income, increase as the proportion of the old in the population grows. By 1970, those aged 65 and over constituted 12 percent of all city residents, an increase of 4 percentage points since 1950. During this same twenty-year period, the nationwide increase was only 2 percentage points. Between 1970 and 1973, the proportion of the city's older population continued to rise, reaching 13 percent. Moreover, in the three-year period ended in 1972, the real income of elderly households declined by 12.6 percent.[4] As the number of young people has also been increasing, the proportion between 25 and 64 years of age, the bulk of the labor force, has fallen since 1960 and now constitutes less than half of the city's population.

Many of those presently receiving social service assistance originally migrated to older industrial areas like New York because there was a traditionally high demand for unskilled labor in these urban manufacturing centers.[5] Lately however, the number of jobs in these areas has declined considerably. Indeed, 1975

[3] The number of persons on public assistance declined sharply in November 1974 because of the transfer of a significant number to the Federally funded Supplementary Security Income Program (SSI). Under the SSI program, the Social Security Administration assumed all administrative and financial responsibility for the Aid to the Disabled, Aid to the Aged, and Aid to the Blind programs. Although the basic SSI payments are uniform throughout the country, some states and/or localities may supplement the minimum payment and make emergency grants for loans to recipients, owing to differences in living costs. During 1975, New York City contributed about $58 million in SSI payments.

[4] These are the latest available data. See New York City Office for the Aging [26].

[5] It has been suggested that the problems in urban areas actually associated with migration have been exaggerated. "Migration to the cities and out of the South is not significant enough nor are migrants' income experiences different enough from their urban and Northern counterparts to warrant the considerable alarm the migration issue stimulates. The most important policy implication of this is that programs to stem migration are not likely to have much impact on city problems." See Wertheimer [42, page 61].

manufacturing employment in New York City was only 55 percent of its 1960 level. Yet, immigration to the older metropolitan centers did not completely halt. In fact, there is some evidence that New York City and other older industrial regions may have unintentionally encouraged the poor to move in by offering relatively generous levels of welfare benefits. This can be seen in Table 3. In the eight largest industrial states, the average benefit distributed under the Aid to Families with Dependent Children (AFDC) program amounts to $270 per month. By comparison, in the eight states with the lowest benefits, the average monthly AFDC payment amounts to only $99. The problem is severe in New York, which pays the highest benefits and has the second largest number of recipients, both in absolute and percentage terms.

Given these differentials, there is an incentive for the poor to relocate to the older industrial regions, and the evidence in Table 4 suggests that such relocation has taken place. As can be seen, the incidence of welfare-receiving mothers who were born out of state is considerably higher in the older industrial
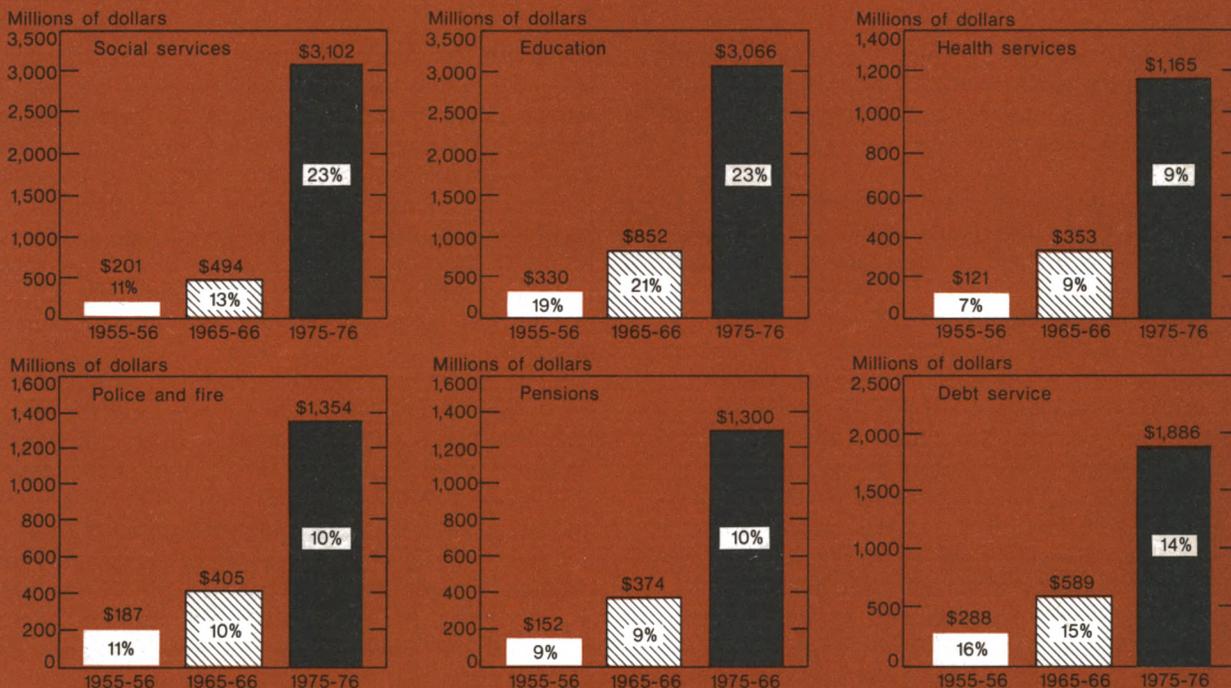
states than it is in the states that pay the lowest welfare benefits.[6] Moreover, in these industrial states, the proportion of the total population born out of state is less than half that of the welfare mothers, whereas in the other states, the figures are about equal.

Yet it should be noted that, as available in New York, neither AFDC payments alone nor a more inclusive package of benefits—net cash, food, and public housing—appears to be out of line with those in some other large cities. A comparison of benefits available to two standard-size families in each of twelve cities is shown in Table 5. The major differences which arise are for the most part between the newer and older cities rather than between New York and the other cities. Nevertheless, the generous level of welfare payments must be included with such factors as the availability of low-cost rental housing and of cheap public transporta-

[6] Neither the birthplace nor the previous welfare status of these welfare-receiving mothers is known. Therefore, there is a possibility that these mothers, already dependent on welfare in a high benefit state, merely relocated to another area of similarly generous benefits and did not migrate from a low benefit area, as is suggested here.

New York City: Major Budget Appropriations
In selected fiscal years

Social services (Millions of dollars)
- 1955-56: $201, 11%
- 1965-66: $494, 13%
- 1975-76: $3,102, 23%

Education (Millions of dollars)
- 1955-56: $330, 19%
- 1965-66: $852, 21%
- 1975-76: $3,066, 23%

Health services (Millions of dollars)
- 1955-56: $121, 7%
- 1965-66: $353, 9%
- 1975-76: $1,165, 9%

Police and fire (Millions of dollars)
- 1955-56: $187, 11%
- 1965-66: $405, 10%
- 1975-76: $1,354, 10%

Pensions (Millions of dollars)
- 1955-56: $152, 9%
- 1965-66: $374, 9%
- 1975-66: $1,300, 10%

Debt service (Millions of dollars)
- 1955-56: $288, 16%
- 1965-66: $589, 15%
- 1975-76: $1,886, 14%

Note: Base includes capital budget and special funds used to finance operating expenditures: 1955-56=$1,782 million, 1965-66=$3,998 million, and 1975-76=$13,233 million.

Sources: Citizens Budget Commission, Pocket Summary of New York City Finances, selected fiscal years, and New York City Expense Budget, 1975-76.

eral report has stated that "under Federal law the state determines eligibility requirements and benefit levels; therefore, the city already has virtually no control over its welfare budget although it must pay one fourth of the cost".[8] The state legislature, however, has a measure of control over local welfare expenditures, insofar as that body determines both the degree of local participation in the funding of these expenses and the amount of benefit payments above the Federally mandated minimum. Since New York City and other localities must by law comply with the statutes established by the state legislature, welfare is probably "uncontrollable" in the short run. In the longer run, the city can try to bring about changes in the state law. In addition, the city does have discretionary control over the administrative and personnel costs associated with the welfare program. While budgeted funds for the Department of Social Services and the Human Resources Program exceed $3.1 billion, salary expenses connected with the welfare program total $287 million, or less than 10 percent. Of course, to the extent that personnel savings are achievable, this would represent a net gain to the city, assuming that efficiency is not adversely affected.

It is important to note that, under state law, New York City is obligated to assume an inordinately large share of welfare costs relative to cities in other states. For example, localities in New York State must pay 25 percent of total welfare costs, while those in California pay only 16 percent. Moreover, of the states that do not take full responsibility for the non-Federal share, New York State shifts the heaviest burden on to its localities.[9] The states, in turn, receive varying contributions toward their welfare costs depending on the Federal Government's assessment of each state's ability to pay. Thus, while Mississippi receives support for more than 70 percent of its welfare and Medicaid programs, New York State receives the minimum subsidy, i.e.,

[8] See Congressional Budget Office [9, page 27].

[9] In New York State there is also a non-Federally backed home-relief program shared jointly by the state and the localities.

Table 3
Aid to Families with Dependent Children (AFDC)
By state, July 1975

Governmental unit	Number of recipients*	Percentage of total	Average family monthly payment	Percentage of total population†
Total United States	11,147,071	100	217.01	100
Total, eight largest industrial states	5,965,540	54	270.26	45
California	1,368,634	12	239.75	10
Illinois‡	768,608	7	286.70	5
Massachusetts‡	354,313	3	317.32	3
Michigan	651,340	6	268.95	4
New Jersey	443,201	4	274.13	3
New York	1,204,259	11	336.67	9
Ohio	538,442	5	174.33	5
Pennsylvania	636,743	6	264.23	6
Total, eight states with lowest benefits	1,929,802	16	98.62	18
Alabama	159,242	1	97.33	2
Florida	263,644	2	117.59	3
Georgia	353,843	3	101.63	2
Louisiana	234,169	2	119.88	2
Mississippi	185,919	2	49.79	1
South Carolina	135,408	1	89.23	1
Tennessee	203,626	2	106.36	2
Texas	393,951	3	107.13	5

* Includes the children and one or both parents or one caretaker relative other than a parent in which the requirements of such adults were considered in determining the amount of assistance.
† Based on 1970 Census and 1972 Census Bureau estimates, total United States population is equal to 208,840,000.
‡ Excludes data on AFDC child care.
Source: Social Security Bulletin (July 1975) and Bureau of the Census (1970), Fourth Count Summary Tapes, as reported in Senator Donald Halperin, Federalization of Welfare (November 1975).

Table 2

Major Expenditures in the New York City Budget

Selected fiscal years; in millions of dollars and percentage of total expenditures

Category	1955-56 Expenditure	Percent	1960-61 Expenditure	Percent	1965-66 Expenditure	Percent	1970-71 Expenditure	Percent	1974-75 Expenditure	Percent
Department of Social Services	201	11.3	246	10.5	494	12.4	1,712	21.0	2,438	19.4
Board of Education	303	17.0	440	18.8	768	19.2	1,535	18.9	2,127	16.9
Health Services Administration	121	6.8	151	6.4	353	8.8	723	8.9	1,096	8.7
Police Department	122	6.8	168	7.2	272	6.8	477	5.9	739	5.9
Board of Higher Education	27	1.5	45	1.9	84	2.1	298	3.7	533	4.2
Environmental Protection	*	*	109	4.6	161	4.0	271	3.3	384	3.1
Fire Department	65	3.6	85	3.6	133	3.3	215	2.6	309	2.5
Pensions	152	8.5	215	9.2	374	9.4	619	7.6	1,147	9.1
Debt service	288	16.2	402	17.1	589	14.7	832	10.2	1,798	14.3
Other	503	28.2	484	20.6	770	19.3	1,453	17.9	2,019	16.0
Total expenditures	1,782	100.0	2,345	100.0	3,998	100.0	8,135	100.0	12,590	100.0
Less: Capital budget and special funds used to finance operating expenditures	46		—		123		426		1,486	
Expense budget	1,736		2,345		3,875		7,709		11,104	

* Not available.

Source: Citizens Budget Commission, *Pocket Summary of New York City Finances,* selected fiscal years.

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tion in making New York a relatively attractive city for those with little income. From this perspective, the influx and permanent settlement by the poor can be viewed as a rational response to economic incentives.

Controllable vs. uncontrollable expenditures

It is frequently noted that many of the city's expenditures are either mandated by state law or are undertaken by so-called independent agencies, such as the Health and Hospitals Corporation. Such expenses are termed "uncontrollable", at least in the short run. On the other hand, since the legislation which established the independent agencies and other programs can be changed over time, the distinction between "controllable" and "uncontrollable" tends to blur in the longer run. In Table 6, the city's expenses for fiscal 1976 have been divided into those that the city closely controls and those that, at least in the short run, it does not.

With regard first to the independent agencies—i.e., the Board of Education, the Board of Higher Education, and the Health and Hospitals Corporation—it should be noted that they were set up under state legislation at the city's behest to circumvent local budgetary controls which had supposedly hampered flexibility and innovative management. As initially conceived, each agency was governed by an independent board. The city made lump-sum allotments to each agency but had little control over how the funds were spent. The Mayor could reduce allocations to these agencies within limits prescribed by state law, but the actual distribution of funding cutbacks was up to the discretion of the individual agency's board. Besides legal restrictions, the Mayor's control over agency finances was also circumscribed by the fact that, to receive state or Federal aid for the agencies, the city frequently had to come up with minimum or matching amounts.

Since the onset of the New York City financial crisis, the autonomy and independent authority of these agencies has been altered somewhat by the Emergency Financial Control Board. Hence, their expenses are now more controllable than they were in the past, and presumably new state legislation could be sought if it were considered necessary to change the agency budgets. In fact, the persistent deficit in the budget of the Health and Hospitals Corporation recently prompted the Mayor to set up a new finance committee to see that the deficit is eliminated.[7]

Welfare expenditures are the largest item among the mandated "uncontrollables" in Table 6. A recent Fed-

[7] See Sullivan [32, page 47].

Table 4

Aid to Families with Dependent Children (AFDC)

By place of birth of mother; in percent

Governmental unit	Percentage born in same state	Percentage born in another state or county AFDC mothers	Percentage born in another state or county Total population
United States total	52.2	47.8	30.8
New York City*	25.0	66.2	13.4
Total, industrial states ..	45.1	54.9	25.0
California	32.5	67.5	47.4
Illinois	36.7	63.3	23.5
Massachusetts	63.3	36.7	17.8
Michigan	48.8	51.2	23.6
New Jersey	35.2	64.8	32.7
New York State	34.1	65.9	17.8
Ohio	47.5	52.5	24.3
Pennsylvania	62.8	37.2	12.7
Total, states with lowest benefits	75.6	24.3	23.5
Alabama	84.5	15.5	15.5
Florida	46.6	53.4	56.7
Georgia	84.0	16.0	21.3
Louisiana	82.4	17.6	16.7
Mississippi	89.6	10.4	14.9
South Carolina	†	†	19.0
Tennessee	70.9	29.1	21.1
Texas	71.8	28.2	22.4

* The birthplace of approximately 8.8 percent of AFDC mothers in New York City is unknown.

† Not available.

Sources: Department of Health, Education, and Welfare, Social Securities Statistics (1971) and Division of Policy Research, Department of Human Resources (January 1975), as reported in Senator Donald Halperin, Federalization of Welfare (November 1975), and 1970 Census of the Population, Table 45, individual state volumes.

Table 5

Annual Public Welfare Benefits

July 1972; in dollars

City	Mother and three children AFDC*	Mother and three children Maximum benefit package*†	Husband, wife, and two children AFDC*	Husband, wife, and two children Maximum benefit package*†
Baltimore	2,400	4,248	2,400	4,095
Boston	4,121	6,136	4,075	5,972
Chicago	3,251	5,021	3,179	5,081
Denver	2,820	4,789	2,904	4,738
Detroit	3,792	5,001	3,792	5,074
Houston	1,776	4,070	0	2,737
Los Angeles	3,360	5,304	3,360	5,133
New York City	3,996	5,292	3,996	5,121
Philadelphia	3,612	5,127	3,612	4,965
San Francisco	3,360	5,646	3,360	5,493
St. Louis	1,560	3,945	0	1,389
Washington, D.C. ..	2,862	5,164	2,759	5,056

* Represents maximum benefits available to families in which there is no income from either work or unemployment insurance.

† Net cash, food, and public housing.

Source: Joint Economic Committee, Studies in Public Welfare: Welfare in the 70's: A National Study of Benefits Available in 100 Local Areas (July 22, 1974).

50 percent.[10] The differences in funding among the eleven states which require local participation in the AFDC program are shown in Table 7. As a percentage of AFDC benefits, New York State receives 4 percent less Federal aid than the average of the other ten states and contributes 6 percent less to the welfare expenses of its localities. Hence, from New York City's viewpoint, it must pay 10 percent more than do cities in these other states. Indeed, this inequality looms even larger when it is remembered that thirty-nine

[10] Although New York State receives a comparatively low proportion of Federal assistance, it is among the most generous of the states in its overall level of welfare payments. These differences in payment levels arise because most programs receive Federal funding and operate under Federal guidelines, but the states themselves retain responsibility for their actual implementation and administration. Accordingly, the states retain a fair amount of flexibility in apportioning local responsibility, setting payment levels, etc. See Joint Economic Committee [20] and United States Department of Health, Education, and Welfare [40].

states require no local contributions.

Debt service and pension benefits account for the rest of the city's mandated expenditures. The city is legally bound to meet its debt obligations, under the New York State constitution.[11] Similarly, the city is under a legal obligation to maintain pension benefits and contributions.[12] The existing pension structure, at least insofar as it applies to current retirees and to those presently on the payrolls, is practically impregnable. Indeed, the state constitution forbids the reduction of public employee pension benefits once they have been extended. The one aspect of the city's pension system apparently subject to change is the "increased take home pay" program (ITHP). Under this program, the city had been paying almost all of each employee's pension contribution, thus making the system virtually noncontributory. Unlike other pension provisions, how-

[11] In November 1975, the state legislature enacted a three-year moratorium on the payment of city notes, with provision for an optional "swap" of long-term bonds (which were issued by MAC). However, the New York State Court of Appeals, the highest court in the state, recently held the moratorium unconstitutional under the New York State constitution.

[12] The classification of pension costs as either mandated or controllable depends upon the time horizon considered. Because future pension costs are negotiable, a report prepared by Arthur Anderson and Co. includes them with other controllable expenses. However, the report notes that "past pension service costs may not be reducible, and since the current city contribution to the pension funds is based on prior actual payroll lagged two years, there is no real opportunity for near-term reduction". See Arthur Anderson and Co. [1, page 31].

ever, ITHP was approved by the state legislature in the early 1960's only on a temporary basis. Hence, it could be revised without changing or violating the constitution. Effective January 1, 1976, the legislature decreased the city's annual obligation under this program by 50 percent. This share is now being picked up by the employees who were, however, granted a three-month grace period before beginning contributions. The Chief Actuary of New York City places current annual ITHP costs at about half of the $170 million being spent prior to the change in legislation. However, this $85 million saving will not affect the city's cash position until 1978. This is because pensions have historically been funded with a two-year lag, and so the city is presently paying for its 1974 obligations.

In sum, while a good portion of the city's expense budget may not be immediately controllable by city officials, in the long run the major "uncontrollables" seem to be debt service, pension benefits already granted to past and present employees, and welfare payments mandated by the state. It is, however, within the power of the state, though not the city, to reduce the welfare burden. Pensions, too, can be revised over time, even if it takes an amendment to the state constitution.

Perspective on city spending
To a large extent, the problems of New York City can be traced to the fact that, as an administrative and budgetary entity, it has taken on the responsibility of supporting a wider range of services than most other municipal governments. Although some of these "extra" responsibilities are determined by the nature of the state-city relationship, others have been voluntarily assumed by

the city. This drain on the city's resources has been especially pronounced in the fields of education, welfare, and medical care. As already indicated, New York City is required to shoulder a larger share of welfare costs than most other municipal governments. At the same time, it has had to provide direct funding for education. In most other cities, the educational system is supported by an independent school district which is endowed with separate taxing powers and which receives direct state support. These school districts are not necessarily coterminous with city boundaries and so may encompass a broader tax base than the city alone. For many years, New York City voluntarily provided its residents with tuition-free university education, a program that the city had to abandon in its economy drive. Similarly, the city voluntarily established its extensive hospital system.

In comparing the prevailing expenditure pattern in New York with those of other cities, it is necessary to examine both the range of services which are offered and the level of government which is responsible for the funding. In Table 8, the levels of expenditures and public employment in twelve major cities are compared for a common set of services for each of the municipalities listed in the table. In terms of total municipal services, New York had the highest per capita expenditures in 1973 and the largest number of city employees in 1974. However, when the comparison is limited to those common services provided by all the cities, New York's payroll and outlays are not out of line with those of other cities. In fact, on this basis, several other cities spend higher amounts and employ more workers per capita than does New York. Hence, the unusually broad range of services directly pro-

Table 6
Composition of New York City Expense Budget
Fiscal year 1975-76; in billions of dollars and percentage of contribution

Budget expenses	Federal Amount	Federal Percent	State Amount	State Percent	City Amount	City Percent	Total expense
Mandated expenses:							
Debt service	—	—	—	—	1.5	100	1.5
Welfare (excluding salary and administration)	1.4	50	0.7	25	0.7	25	2.8
Pensions	—	—	—	—	0.5	100	0.5
Independent agency control:							
Board of Education	0.5	19	1.6	62	0.5	19	2.6
Board of Higher Education	—	—	0.2	40	0.3	60	0.5
Health and Hospitals Corporation	0.3	33	0.1	11	0.5	56	0.9
Total not directly controllable	2.2	—	2.6	—	4.0	—	8.8
Controllable expenses	0.2	6	—	—	3.1	94	3.3
Total expense budget							12.1

Source: New York City Expense Budget, 1975-76.

Table 7

Government Funding of Costs of Aid to Families with Dependent Children

In percentage of contribution

States	Federal	State	Local
California	50	34	16
Colorado	50	40	10
Indiana	53	28	19
Minnesota	52	24	24
Montana	59	27	14
New Jersey	50	38	13
North Carolina	64	18	18
North Dakota	53	35	12
Ohio	50	45	5
Wyoming	57	22	22
Average ten states	54	31	15
New York State	50	25	25
New York difference	4	6	10

Note: Because of rounding, figures do not necessarily add to totals.

Sources: Social and Rehabilitation Service, "State Assistance Expenditures", *Federal Register* (September 13, 1974), p. 33020; Social and Rehabilitation Service, *Characteristics of State Plans for Aid to Families with Dependent Children under the Social Security Act Title IV-A* (1974).

Table 8

Per Capita Municipal Expenditures (Fiscal 1973) and Employment (1974)

City	Per capita expenditures		City employees per 10,000 population	
	All present city functions	Standard city functions*	All present city functions	Standard city functions*
New York	1,224	435	517.1	263.7
Boston	858	441	378.0	249.2
Chicago	267	383	140.0	250.1
Newark	692	449	391.1	304.6
Los Angeles ...	242	408	162.2	256.0
Philadelphia ...	415	395	163.8	301.5
San Francisco .	751	488	312.5	244.4
New Orleans ...	241	260	177.3	271.3
St. Louis	310	360	241.9	227.8
Denver	473	375	237.0	280.9
Baltimore	806	470	434.1	312.5
Detroit	357	396	194.8	258.6

* Elementary and secondary education, highways, police, fire, sanitation, parks, general and financial administration.

Sources: United States Bureau of the Census, *City Government Finances in 1972-73* (1974), United States Bureau of the Census, *Local Government Finances in Selected Metropolitan Areas and Large Counties 1974* (1975), United States Bureau of the Census, *Local Government Employment in Selected Metropolitan Areas and Large Counties 1974* (1975), and unpublished United States Census Bureau data, as reported in Congressional Budget Office, *New York's Fiscal Problems: Its Origins, Potential Repercussions and Some Alternative Policy Responses* (Washington, D.C.: October 10, 1975), page 16.

vided by New York accounts, at least in part, for what is viewed in some quarters as an excessively large budget.

To examine further the issue of whether New York directly provides more financial support for services than other localities, it would be helpful to have estimates of the per capita cost of total services provided by the major municipalities—estimates, that is, of the total costs incurred at the local level regardless of the local government or local governmental agency providing the services. The available evidence suggests that per capita expenses in New York are above those of most other major cities, particularly in the areas of welfare, education, and health. Confidence in these comparisons is limited, however, by the fact that the data are not very good. It does appear, nevertheless, that New York City's provision of "extra" services not paid for by many other municipal governments or, in some cases, not provided by any local governmental unit, has been a major cause of the recent series of expense-budget deficits. But, considering that the city has been supporting these services for many years, their costliness in recent years has been aggravated by changes in the demographic and economic makeup of the city.

Fueling the controversy over the appropriateness of supplying particular services are charges that excessive manpower costs have been incurred in their provision. Unfortunately, it is nearly impossible to examine adequately the frequent contention that *total* compensation of New York City employees, including fringe benefits and pensions, is excessive relative to that of other municipalities and to private industry. Data limitations preclude comparison of total compensation packages in which much confidence can be placed. It does appear, however, that at least some New York City office and clerical workers receive higher wages than their counterparts in private industry, as shown in Table 9. It would also seem likely that, if anything, differences in fringe benefits have exacerbated this gap.

Revenues

The responsibility for the provision of a comparatively wider range of services has forced New York City to strain its revenue-generating sources to a greater extent than have other central cities. New York City's tax base has lately been shrinking. Property taxes are the city's main local source of revenue. They provided about

one half of 1975-76 locally raised revenues. Yet total tax arrearage for all properties (commercial, industrial, and residential) has been rising and presently amounts to more than $500 million.[13] Hence, it is not surprising that the proportion of locally raised revenues derived from real estate tax receipts has been steadily declining. It can be seen in Table 10 that these receipts have dropped from 61 percent of local revenues in fiscal 1966 to 50 percent in fiscal 1976.

The persistent declines in private sector employment in the city have also had an adverse effect on locally raised revenues. The decline in nonagricultural payroll employment amounted to about 500,000 jobs between June 1969 and July 1975. Each job lost diminishes total tax receipts, particularly from personal income taxes and sales taxes. It has been estimated that each city-based job generated $820 in tax revenues for the city in 1970.[14]

Inflation has also had a deleterious effect on the city's revenues. In the short run, expenditures respond quickly to the upward movement of prices, as do sales and income tax receipts to some extent. Property reassessments, however, cannot keep pace with price surges, in part because of the occurrence of unanticipated rates of inflation during the relatively long time periods between the setting of assessments and actual collection of taxes. This is not to say that New York alone among municipalities has suffered from the distorting effects of inflation. Although inflationary conditions lower the real burden of outstanding municipal debt, they also necessitate additional borrowing since, as noted, there is evidence that city expenditures in general have been more responsive to inflation than have its revenues.

Proposed remedies

The city's ongoing financial problems have brought forth a number of suggestions for easing the budgetary squeeze. Some of these are economizing measures which aim at increased reliance on private enterprise to perform functions which have heretofore been provided by the city. Such measures, of course, involve reductions in personnel on the city payroll. In addition, a second set of proposals calls for transferring provision of certain services from the city to either the state or the Federal Government. On the revenue side, there are occasionally suggestions for higher taxes, but the tax burden on local residents is already so high

that the consensus is that any further tax increase is likely to be self-defeating. Of course, reform of the city's accounting procedures—which is in progress—is an essential part of any plan for resolving the city's problems.

Among the suggestions for a greater role for private enterprise is the hiring of private haulage firms to replace, at least in part, the Municipal Sanitation Department. It has been estimated that costs to the municipal department are 68 percent higher than to the average private contract firm to provide twice-a-week curbside collection service. The many contributing factors to this differential include higher employee absentee rates, larger crews, fewer households serviced per shift, more time per household, and smaller trucks, all characteristic of municipal service.[15] Limited experimentation along these lines is beginning within the Sanitation Department in the handling of garbage collection by a worker cooperative under an independent contract with the city. The motivation for improving techniques is to be provided by the possibility of larger paychecks. As a more extreme suggestion, it has even been proposed that the responsibility for education be transferred to the private sector under a government subsidized voucher plan.[16] The education benefits extended to eligible United States war veterans provide a successful precedent of this type of program. Those who were qualified were given a uniform sum to be spent in any institution which met minimum Government standards.

Many variations of these ideas are possible, all of which could have exceedingly complicated political and social, as well as economic, ramifications. Hence, it is not surprising that many of the more drastic innovations have not been attempted. However, the city has achieved some budget economies through personnel cutbacks and other austerity measures.

Besides cutbacks in expenditures, other proposals call for transferring various elements of the burden to some other level of government. Most recommendations of this type concentrate on the welfare system.[17] The most common of these include (1) increasing the state and Federal proportions of the payments and consequently reducing the city's share of the costs; (2) federalizing the welfare system altogether; (3) installing a Federally based negative income tax system which would replace welfare payments in their present form; and (4) increasing noncash benefits, such as food stamps, while reducing cash payments.

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[13] There is evidence that the rent-control system has exacerbated the housing problem in New York City. Landlords, receiving lower returns in the face of rising costs, have neglected or, in the extreme, entirely abandoned their housing units. This, in turn, has diminished the city's tax base and, thus, its revenue inflow. According to one study, the elimination of rent control could raise city revenues by as much as 6 percent. See Lowry, De Salvo, and Woodfill [22].

[14] See Bahl, Jump, and Puryear [3, page 8].

[15] See Savas [29, page VI]

[16] See Friedman [14, pages 89-90].

[17] In this regard, bear in mind that, since the city's contribution to welfare is 25 percent, savings here would amount at most to about $700 million, excluding salary and administration expenses.

Table 9

New York City—Average Weekly Earnings of Men and Women Combined

In dollars; April 1973-74-75

Employment classification	Private industry	Municipal workers	Difference
April 1973:			
Senior stenographers	149.00	165.00	+16.00
Typists—Class B	114.00	131.25	+17.25
Keypunch operators—			
Class B	126.50	145.75	+19.25
Computer systems analysts—			
Class A	335.50	343.50	+ 8.00
April 1974:			
Senior stenographers	160.50	175.75	+15.25
Typists—Class B	119.50	134.00	+14.50
Keypunch operators—			
Class B	138.00	147.75	+ 9.75
Computer systems analysts—			
Class A	360.50	347.25	−13.25
April 1975:			
Senior stenographers	172.00	191.75	+19.75
Typists—Class B	133.50	148.00	+14.50
Keypunch operators—			
Class B	147.00	163.25	+16.25
Computer systems analysts—			
Class A	385.00	356.75	−28.25

Sources: Bureau of Labor Statistics, *Area Wage Survey, New York, New York Metropolitan Area* (annual). Bureau of Labor Statistics, *Wages and Benefits of New York City Municipal Government Workers* (September 1975).

State and Federal takeover of services other than welfare has also been suggested. The proposals include a Federal program to equalize energy costs; increased aid to education, mass transit, and hospitals; regionalization of such services as transportation or environmental protection; Federal assumption of the security costs incurred because of the United Nations and foreign consulates; and the conversion of city highways into interstate arteries which would, in effect, make them Federal responsibilities.

In addition to the numerous methods for both streamlining and transferring expenditures, there are proposals which attack the problem from the revenue side. Yet, due to the high level of taxes already paid by city businesses and residents, any further taxes may have detrimental rather than recuperative effects on the city's faltering economy.[18] For the past nine years, New

York State has led the nation in per capita state and local tax payments, exceeding the national average in fiscal 1973-74 by 54 percent and that of both New Jersey and Connecticut by almost 40 percent.[19] This sizable tax differential is prominent among the reasons cited by major firms for abandoning New York for locations in neighboring states in which it is felt that the tax burden on the corporation itself and/or its employees would be smaller.[20]

When the tax burdens of individual cities are examined, it similarly appears that New York City is well up on the list. The government of the District of Columbia compared the tax burden of a family of four at different income levels in the nation's thirty largest cities. The "burdens" include state and local income taxes, state and local sales taxes, automobile taxes, and residential property taxes adjusted for intercity differences in property values. A summary of these findings is shown in Table 11. At each income level, the combined state-local tax burden of New York City residents is either second or third highest.

Summary

Overall, the evidence marshaled here indicates that a broad array of factors, some of a fundamental economic nature and some reflecting peculiarities specific to the city, combined to create the financial problem that emerged in 1975. The dramatic loss of jobs in the city, stemming in part from the two recessions experienced over the 1969-75 period, was one factor. The virulent nationwide inflation with which city revenues, particularly from the property tax, were unable to keep pace was another. And demographic changes which led to a concentration of the low-income aged in the city and simultaneously reduced the proportion between the ages of 25 and 64, the primary labor force group, also contributed to the ongoing budgetary and financial strains.

Beyond this, New York City's distress can be attributed to a measurable extent to the fact that it has responsibility for supporting a broader range of services than are provided by most other municipal governments. There are really two aspects to this problem. First, New York City directly funds some services that are supported elsewhere by local instrumentalities other than the municipal government. While it is not clear how serious a problem this creates, it does suggest that New York supports certain services from a relatively narrow tax base compared with some other localities.

[18] Approximately $200 million in New York City taxes was approved by the Albany legislature in November 1975. However, the controversial corporate bond transfer tax passed by the legislature in August 1975 has already been repealed. It is blamed for the exodus of several brokerage houses from the city. See *Wall Street Journal* [41].

[19] United States Bureau of the Census [34, Table 22].

[20] High taxes have existed for many years, but other favorable factors which once outweighed the costs of locating in New York have now become less important.

Table 10

New York City: Actual Receipts from Local Revenue Sources

In millions of dollars and percent

Revenue sources	1965-66 Revenue	1965-66 Percent	1970-71 Revenue	1970-71 Percent	1974-75 Revenue	1974-75 Percent	1975-76 Revenue	1975-76 Percent
Real estate tax	1,432	60.9	1,960	55.2	2,619	51.3	2,898	49.8
Sales tax	382	17.3	494	13.9	791	15.5	825*	14.2
Utility tax	31	1.4	50	1.4	90	1.8	93	1.6
Personal income tax	—	—	199	5.6	466	9.1	528	9.1
Business income tax	214	9.7	252	7.1	444	8.7	688	11.8
Stock transfer tax	94	4.3	259	7.3	185	3.6	270	4.6
Commercial occupancy tax	72	3.3	140	3.9	191	3.7	198	3.4
Off-track betting	—	—	—	—	67	1.3	65	1.1
Water charges	49	2.2	158	4.4	191	3.7	174	3.0
Fines and forfeitures	18	0.8	39	1.1	66	1.3	85	1.5
Total	2,202	100.0	3,551	100.0	5,110	100.0	5,824	100.0

* Includes $655 million in funds earmarked for the Municipal Assistance Corporation.

Source: Citizens Budget Commission, *Pocket Summary of New York City Finances,* selected fiscal years.

Table 11

Estimated Burden of Major Taxes* for a Family of Four

By adjusted gross income, 1974; in dollars and by rank

City	$5,000 Burden	$5,000 Rank	$10,000 Burden	$10,000 Rank	$15,000 Burden	$15,000 Rank	$20,000 Burden	$20,000 Rank	$30,000 Burden	$30,000 Rank	$40,000 Burden	$40,000 Rank
Atlanta	386	26	745	20	1,214	17	1,687	16	2,606	13	3,483	12
Baltimore	480	10	1,051	8	1,573	7	2,099	6	3,083	7	4,033	8
Boston	1,040	1	1,965	1	2,901	1	3,761	1	5,300	1	6,822	1
Chicago	654	4	1,114	5	1,616	6	2,018	7	2,769	12	3,456	13
Detroit	425	19	829	15	1,490	9	2,015	8	3,009	8	3,965	9
Houston	389	25	610	29	858	29	1,053	28	1,395	27	1,693	27
Los Angeles	553	5	1,061	7	1,743	5	2,386	5	3,690	5	5,205	5
New York City	654	3	1,267	3	1,977	3	2,707	3	4,385	2	6,354	2
Philadelphia	504	7	1,062	6	1,555	8	1,988	9	2,791	11	3,569	11
San Francisco	413	23	833	14	1,407	10	1,954	10	3,105	6	4,464	6
Washington, D.C.	427	18	853	13	1,341	11	1,827	11	2,873	9	3,965	10
Average for thirty cities	473	—	879	—	1,333	—	1,753	—	2,567	—	3,397	—

* Includes income, sales, auto, and real estate taxes.

Source: Department of Finance and Revenue, *Tax Burdens in Washington, D.C., Compared With Those in the Nation's Thirty Largest Cities* (Washington, D.C.: Government of the District of Columbia, 1974).

Further, the city has attempted to provide more services, in absolute terms, than are found in most other urban areas. This provision of extra services is particularly evident in education, medical care, and welfare. While tuition-free university education for city residents has been dropped, vexing problems remain in these areas.

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Measuring Capacity Utilization in Manufacturing

by James F. Ragan

Capacity utilization rates play an important role in evaluating economic activity. They have been used, along with other factors, to explain the behavior of investment, inflation, productivity, profits, and output. In addition, information on capacity utilization can aid businessmen and economists in assessing current economic conditions and forecasting future activity. Unfortunately, alternative measures of capacity utilization do not always tell the same story. There are frequent discrepancies between the levels of the various series as well as discrepancies in their movements. The purpose of this article is twofold: (1) to examine how well alternative measures of capacity utilization seem to reflect the current availability of unused capital stock and (2) to assess the current capacity situation in manufacturing.

There are four principal measures of capacity utilization in manufacturing—those of the Wharton School, the Board of Governors of the Federal Reserve System (FRB), the Bureau of Economic Analysis (BEA), and McGraw-Hill.[1] After a general discussion of the concept of capacity, each of these measures is critically evaluated. All have flaws but, provided one is aware of their particular biases and shortcomings, valuable information can still be gleaned from them. While

[1] For purposes of comparison, all four measures reviewed here refer to manufacturing utilization. The Wharton School and McGraw-Hill also publish utilization rates for a broader industrial classification, which includes mining and utilities. In each instance, the criticisms raised at the manufacturing level carry over to the industrial level. Utilization rates are available at more disaggregated levels as well. The FRB publishes utilization rates for both primary- and advanced-processing manufacturing and also releases a separate index for the materials sector. Finally, Wharton, McGraw-Hill, and BEA utilization rates are available for individual manufacturing industries.

there is no one "best" measure for all purposes, over-all the FRB utilization rate probably reflects current utilization of capital stock most accurately, provided that the statistical relationships on which it is based are kept up to date. Finally, based on present utilization rates, the prospects for capacity problems in manufacturing over the next year or so appear remote. This is true for key manufacturing subsectors as well as for aggregate manufacturing.

Capacity—an elusive concept

Capacity refers to the quantity of output that can be produced in a fixed period of time, given the existing stock of capital. There are, however, a number of interpretations for the expression "can be produced". The engineering interpretation relates to the quantity of output that could be turned out if, apart from required maintenance, plants and equipment were operated around the clock seven days a week. Since most plants and equipment are operated only a fraction of that time, a more common interpretation of capacity refers to the maximum quantity of output producible under "normal conditions". While the concept of normality is admittedly vague, it seems to be based on the notion of average or typical conditions. According to this interpretation, capacity describes the maximum producible output when plants and equipment are operated the average amount of time producing the normal mix of output.[2] One difficulty with this approach is that the view of what is normal changes over time.

[2] Specifying the output mix is important for any definition of capacity. The rate and duration of machine breakdowns frequently depend on what is being produced, and the longer a machine is down the less that can be produced.

As workers have gained shorter workweeks and greater vacation time, the "normal operating period" has apparently contracted. Furthermore, as discussed later, the concept of normal production seems to change over the business cycle.

Capacity has also been defined from a cost perspective.[3] Some view capacity as the level of output where average per unit cost is at a minimum, while others see it as the level beyond which the cost of producing additional ouput rises sharply. A practical problem with the cost approach is that few firms maintain suitable cost data. Furthermore, studies of the relationship between costs and output suggest that for some products there may be no unique level of output for which average cost is smallest. Instead, per unit costs may be about constant over wide ranges of production. And for some other products, unit costs do not show signs of rising even at very high levels of output.[4]

The McGraw-Hill and BEA measures of capacity are tied to "normal" conditions. Although capacity is not actually defined by McGraw-Hill and the BEA, most companies surveyed by them indicate that this is the concept they had in mind.[5] Since the FRB utilization rate is constructed from that of McGraw-Hill, it too is linked to "normal" conditions. The Wharton utilization rate, in contrast, is based on an entirely different concept: observed production peaks. Capacity is assumed to equal output at production peaks, and between peaks capacity is estimated by linear interpolation.

A second distinguishing feature of Wharton capacity is that it is a function of labor availability. Since production depends on labor as well as capital, production peaks are influenced by the supply of labor.[6] The other three indexes of capacity are entirely capital oriented, i.e., they address the question of how much output can be produced with a given stock of capital, assuming labor, raw materials, and parts are all readily available. Thus, the Wharton measure of capacity is related to labor availability; the others are not.

Because the concepts of capacity differ, as do the construction techniques, it is not meaningful to compare values of alternative utilization measures. The Wharton utilization rate, for example, has always exceeded the McGraw-Hill rate, frequently by 8 percentage points or more (see the chart). Clearly then, a Wharton value of, say, 90 percent indicates lower

capacity utilization than does a McGraw-Hill reading of 90 percent. Furthermore, a given value of utilization means very little *per se*. Only by comparing this value with past values of the same measure, especially those of previous troughs and peaks, is it possible to assess the degree of capacity utilization.

Finally, since shortages and bottlenecks in key industries may effectively limit production, in spite of substantial unused capacity elsewhere, it is clear that conditions in the economy cannot be fully described without considering utilization rates in important subsectors. For this reason, industry utilization rates will, in the final section, also be examined. International conditions are relevant as well. For one thing, production in the United States is less likely to be constrained the more readily firms can import goods, materials, and energy from abroad. Aggregate utilization rates cannot, therefore, completely characterize an economy's capacity situation; they are most valuable when supplemented with additional information. Bearing in mind these limitations, the principal measures of utilization in manufacturing are reviewed in the following section.

An analysis of four measures of manufacturing utilization[7]

The Wharton index of capacity is based on the "trend-through-peaks" method.[8] Output, as measured by the Federal Reserve Board's series on industrial production, is plotted for each of the major manufacturing industries, e.g., primary metals, electrical machinery, and chemicals. Successive cyclical peaks are then joined together with straight line segments. The resulting series of connected linear segments is the industry's capacity measure. To obtain the industry's utilization rate, output is simply divided by capacity. The utilization rate for all manufacturing is derived by summing the industry utilization rates, each weighted by the fraction of total national income contributed by the industry at full employment.

Because of the computational method employed, an industry's utilization rate equals 100 percent at all major production peaks.[9] This is both a strength and a weakness of the Wharton technique. On the positive side, capacity values are attainable. At each of the

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[3] See de Leeuw [2] and Edmonson [4].

[4] See Walters [17].

[5] See Matulis [13] and Hertzberg, Jacobs, and Trevathan [7].

[6] Furthermore, production functions containing labor as an input are sometimes used to adjust the Wharton index.

[7] There exist several other measures of capacity utilization, but none are more than a few years old. With so few observations, it is difficult to say much about these series.

[8] See Klein and Summers [9], Klein and Preston [8], and Adams and Summers [1].

[9] Not all production peaks are associated with utilization rates of 100 percent. If a peak is judged to be "weak", i.e., associated with unused capacity, the capacity line will lie above the peak, and capacity utilization will be less than 100 percent.

Measures of Capacity Utilization in Manufacturing
Seasonally adjusted
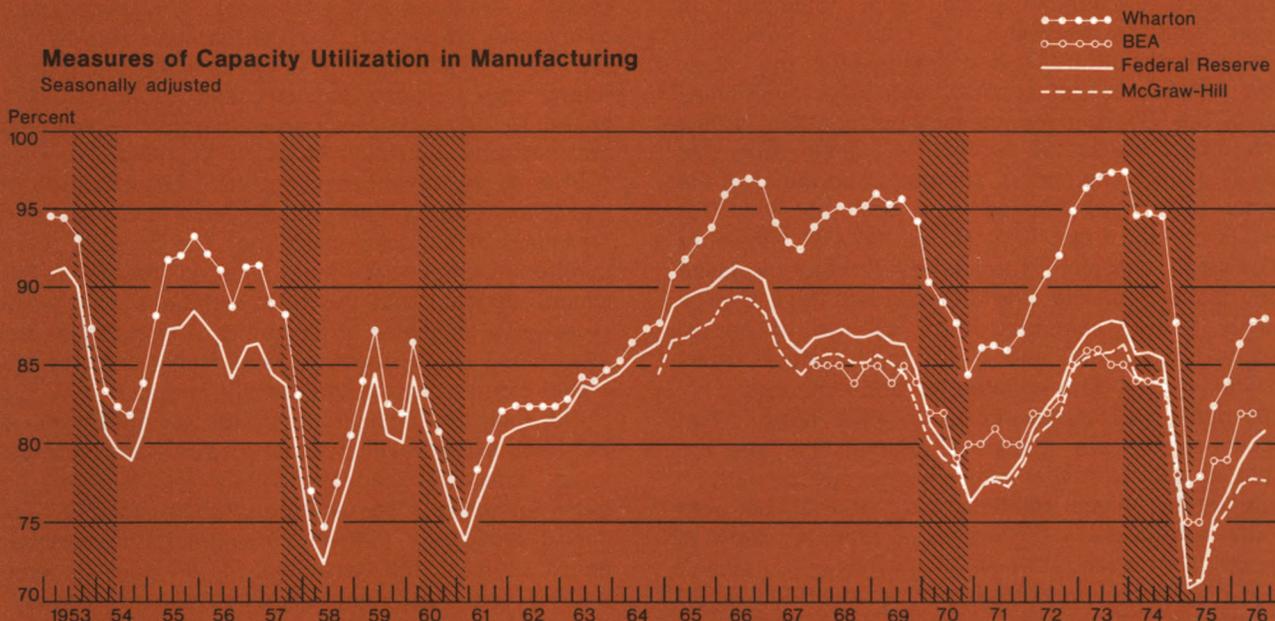
Legend:
●●●● Wharton
○○○○ BEA
—— Federal Reserve
- - - - McGraw-Hill

Note: Shaded areas represent periods of recession as defined by the National Bureau of Economic Research except for the latest recession, which is tentatively judged to have ended in March 1975.

Sources: Wharton Econometric Forecasting Associates; Board of Governors of the Federal Reserve System; McGraw-Hill Publications Company, Department of Economics; United States Department of Commerce, Bureau of Economic Analysis (BEA).

major peaks, the Wharton value of potential output is known to be producible; indeed, this is the level of output actually observed. Furthermore, output never exceeds Wharton capacity but may, and sometimes does, exceed alternative measures of capacity.[10] Thus, a capacity value of 100 percent has special meaning for the Wharton index, and only for the Wharton index.

Assigning a capacity value of 100 percent to the major peaks does, however, have a serious drawback: there is no way to determine intensity of production at different peaks. Instead, capacity utilization is assumed to be identical at every major peak, an assumption that is highly questionable. Another criticism of the Wharton technique is that it is not completely objective. Whether or not a production peak is one of full capacity is sometimes difficult to determine. In such situations, outside information, e.g., engineering data and industry surveys, is consulted. Still, the choice may not be obvious.

The Wharton approach has also been faulted for its assumption that capacity growth between peaks can be represented by a straight line. Presumably, capacity

growth is related to productive investment, which need not occur in equal increments each quarter. Better estimates of capacity could probably be derived by introducing investment data.

The final and most serious shortcoming of the Wharton capacity measure is that, because the next production peak is not known, the current rate of capacity growth can only be estimated. This is generally accomplished by extrapolating the capacity index at its current slope. If the projected and actual growth rates differ, however, the error will accumulate over time. If projected capacity growth exceeds actual growth, the utilization rate will become increasingly downward biased; if actual exceeds projected growth, an upward bias will develop. As the next major peak is approached, the error will be corrected, but the revision required may be substantial. For example, the aggregate industrial utilization rate for the first quarter of 1962 was estimated to be 94 percent in 1962-I, 92 percent in 1963-I, 85 percent in 1965-I, and 82.8 percent in 1967-I.[11] Thus, in five years the estimate of

[10] For example, in 1973 production in the automotive industry was running at 111.5 percent of capacity, according to the McGraw-Hill index.

[11] See Summers [16, page 33]. The numbers cited are for the industrial sector, which includes mining and utilities as well as manufacturing. Separate numbers for the manufacturing sector were not reported.

capacity utilization was lowered by 11.2 percentage points. It is difficult to place much confidence in current Wharton estimates of capacity utilization, knowing they could be revised drastically in the future.

The FRB's index of capacity utilization overcomes most of the Wharton weaknesses but contains a flaw of its own. The actual method of constructing this index is quite complicated. Without elaborating on the Board's technique,[12] suffice it to say that the FRB index is derived from three series: (a) the December McGraw-Hill operating rate series (to be discussed later), (b) a separate and independent McGraw-Hill capacity series, computed from surveys of annual changes in capacity, and (c) a capital stock series based on census data deflated for price changes.

The main criticism leveled at the FRB index is that it relies on "historic statistical relationships that are simple at best and that may change substantially".[13] Consequently, these relationships need to be continually reestimated. Otherwise, a bias is likely to develop. The recent FRB revisions make this clear.[14] Based on the statistical relationships which the Board estimated in 1971, capacity utilization in 1976-III was originally placed at 73.6 percent, which was low by historical standards. But, when the statistical relationships for capacity were reestimated this year, substantially different results emerged. The Board now estimates capacity utilization for 1976-III to be 80.9 percent, which is about midway between the historical high and historical low of the new series. Thus, the Board has revised considerably its assessment of current capacity utilization.

Perhaps the main reason for this change is that the Board does not distinguish between spending which augments capacity and spending which does not. In recent years an increasing proportion of capital spending has been for environmental and safety factors,

which do not add to capacity.[15] Consequently, in this decade, additions to capital stock increased capacity by a lesser amount on average than was true over the previous two decades. Therefore, using the pre-1971 relationship between capacity and capital stock resulted in capacity being overstated in recent years and capacity utilization being understated.

Prior to the recent revision, the FRB utilization rate had been drifting lower, away from the other three measures of capacity utilization. The Board's revised numbers, on the other hand, have no discernible bias, which suggests that the FRB technique can provide reasonable estimates of utilization. It is essential, however, that a given statistical relationship not be extrapolated too far beyond the sample period.

The final two measures of capacity utilization—the BEA and McGraw-Hill operating rates—are closely related. Both are based on company surveys, and both seem to measure the same concept of capacity.[16] Each spring, McGraw-Hill asks companies: (1) what percentage of their capacity was used the previous December and (2) how much they expect to add to capacity in the current year. Additions to capacity are assumed to occur in equal monthly increments. Given the December operating rate, the projected monthly changes in capacity, and monthly output data (as recorded by the FRB production index), the operating rate can be estimated for each month of the subsequent year.[17]

The operating rate series are "bench marked" annually, which should prevent any measurement errors from piling up. Bench marking is accomplished by averaging the operating rate calculated in December

[12] Construction of the FRB index is detailed by de Leeuw [3], Enzler [5], and Raddock and Forest [15]. Briefly, the FRB December value of output is divided by the McGraw-Hill operating rate to generate a preliminary estimate of capacity output. This capacity output measure is divided both by the annual McGraw-Hill capacity series and by the capital stock series derived from census data. These two ratios are then each estimated as a function of one or more time trends, and this process generates two separate estimates of capacity. These two estimates are averaged to provide a new and "smoother" capacity series, which is hopefully less subject to measurement errors than the individual series. Next, the new capacity series is interpolated, yielding quarterly and monthly estimates of capacity. This process is currently undertaken at the industry level. (Prior to the recent FRB revisions, capacity had been computed for only two sectors: primary processing and advanced processing.) Capacity is then aggregated across industries, using value-added weights. Finally, the FRB production index is divided by capacity to yield capacity utilization.

[13] Perry [14, page 707].

[14] For a discussion of these revisions, see Raddock and Forest [15].

[15] According to McGraw-Hill [10] and [12], air and water pollution control as a percentage of manufacturers' capital spending rose steadily from 2.8 percent in 1967 to 9.1 percent in 1975. Expenditures for worker protection have also become substantial. In 1972, the first year for which McGraw-Hill has data, they accounted for 3.0 percent of capital spending, and current projections indicate that in 1976 the percentage will reach 3.3 percent.

[16] According to Hertzberg, Jacobs, and Trevathan [7], both operating rates are based on the concept of "maximum practical capacity". This is defined to be the maximum physical quantity of output that can be produced under "normal conditions", i.e., assuming "the usual number of hours per shift, shifts per day, days per week, overtime, vacation, and downtime for repair and maintenance".

[17] This technique is described in general terms by Gang [6]; the computational procedure is detailed by McGraw-Hill [11]. McGraw-Hill calculates the operating rate in a given month (OR_2) as a percentage of the previous month's operating rate (OR_1). They then link the change in operating rate to the former month's value but do so in an imprecise manner. In their example, the operating rate in the initial month is 68.0 percent, and in the second month it is 1.0 percent higher, i.e., $OR_2/OR_1 = 1.010$. OR_2 is then estimated to be 68.0 percent + 1.0 percent = 69.0 percent. In reality, $OR_2 = 1.010 \times 68.0$ percent = 68.68 percent or, rounding as McGraw-Hill does to the nearest 0.5 percentage point, 68.5 percent. Thus, by acting as if percentage and percentage point changes were one and the same, McGraw-Hill introduces a slight measurement error.

with the value actually reported in the subsequent spring survey. The series are also revised each year, to take into account recent information on actual as opposed to expected additions to capacity. Annual end-of-year operating rates are available from 1954, and monthly operating rates from September 1964. The all-manufacturing operating rate is obtained by weighting industry operating rates with 1967 value-added weights.

The BEA asks companies what percentage of their capacity was in use during the final month of the quarter.[18] These surveys were conducted semiannually between 1965 and 1967 and then, in March 1968, switched to a quarterly basis. Operating rates are published for eleven manufacturing industries, for durables and nondurables, for primary and advanced processing, for asset size (three categories), and for all manufacturing. The all-manufacturing operating rate is obtained by weighting industry operating rates with 1969 capacity weights.

Cyclical differences in capacity utilization rates

The various measures of capacity utilization differ in their cyclical behavior. In particular, there is considerable disparity concerning the magnitude of cyclical swings—movements from peaks to troughs or from troughs to peaks. Table 1 compares recent cyclical movements of the various utilization rates. The Wharton and FRB measures capture average conditions throughout the quarter. So does the quarterly McGraw-Hill measure, which is the average of monthly operating rates. The BEA operating rate, on the other hand, reflects conditions in the final month of the quarter—March, June, September, or December. Hence, the timing of this operating rate differs somewhat from that of the other utilization measures. To see whether this timing difference is important, an end-of-quarter McGraw-Hill operating rate was also constructed. The difference between the two McGraw-Hill operating rates is therefore a measure of the effect of timing.

For all three time periods considered, the cyclical swings are smallest for the BEA operating rate. This cannot be attributed to a difference in timing since, for all three cyclical swings, the difference between McGraw-Hill quarterly average and end-of-quarter operating rates is about 1 percentage point or less. Next to BEA, the McGraw-Hill operating rates exhibit the least amount of cyclical variation.

The BEA and McGraw-Hill operating rates are both based on surveys of the percentage of capacity which firms report they are operating. One possible explanation for these operating rates having smaller cyclical

[18] The BEA technique is described by Hertzberg, Jacobs, and Trevathan [7].

Table 1

Magnitudes of Recent Cyclical Swings for Various Manufacturing Utilization Rates

In percentage points

Series	1968-69 peak to 1970-71 trough	1970-71 trough to 1973 peak	1973 peak to 1975 trough	Total movement 1968-75
Wharton	11.5	13.1	20.1	44.7
FRB	11.1	11.5	16.9	39.5
M-H$_{1/4}$*	9.5	10.2	15.2	34.9
M-H$_{mo.}$†	9.0	9.0	16.0	34.0
BEA	6	7	11	24

* M-H$_{1/4}$ is the quarterly average of monthly McGraw-Hill operating rates.

† M-H$_{mo.}$ is the value of the McGraw-Hill operating rate in the final month of the quarter.

Sources: Wharton Econometric Forecasting Associates; Board of Governors of the Federal Reserve System (FRB); McGraw-Hill Publications Company, Department of Economics; United States Department of Commerce, Bureau of Economic Analysis (BEA).

swings is that survey respondents change their concept of capacity over the cycle. When conditions are slack, firms may forget about, or at least fail to consider explicitly, marginal plants and equipment. When conditions tighten and firms are pushed to increase production, they "rediscover" these marginal facilities. Secondly, as conditions tighten, extra shifts may be added. If some firms calculate their operating rate on the basis of a single shift when only one shift is run but on the basis of two shifts when two shifts are run, production will vary over the cycle by a greater percentage than the reported operating rate. In either case, the reported cyclical swing will be more compressed than the actual swing. Research by Perry indicates that operating rates based on survey response do indeed contain such a cyclical bias.[19]

Because the BEA and McGraw-Hill operating rates are derived from surveys, they are biased toward showing too little cyclical variation. The magnitude of bias

[19] See Perry [14, page 711]. If the capital stock remains unchanged, an increase in output should have no immediate impact on capacity. When the Wharton and FRB measures of capacity were examined, there was in fact no relationship between changes in output and changes in capacity. If, on the other hand, survey respondents "rediscover" capacity as output expands, there should exist a positive relationship between changes in output and changes in *reported capacity*. When the McGraw-Hill measure of capacity was used, a positive and statistically significant relationship did appear; each 10 percent increase in current output led to a 2.3 percent increase in reported capacity, even after the impact of changes in capital stock was netted out. Thus, operating rates constructed from surveys apparently contain a cyclical bias; reported swings in capacity utilization are less than actual swings.

differs, however. The McGraw-Hill cyclical swings are not very far below those of the FRB; the BEA cyclical swings are. Thus, the McGraw-Hill operating rate apparently contains less of a cyclical bias than the BEA operating rate. One reason for this may be the difference in sampling techniques.[20]

Large firms are oversampled in the McGraw-Hill survey, and small firms are undersampled. The BEA, on the other hand, has a somewhat more representative selection of firms. Thus, if the operating rate varies more over the cycle for large firms than for small firms, the McGraw-Hill operating rate should exhibit greater variation than the BEA operating rate. Does the operating rate vary more for large firms? Apparently it does, as Table 2 demonstrates. For total manufacturing, as well as for the durables and nondurables subsectors, there is a tendency for swings in capacity utilization to be greater in large companies. McGraw-Hill's oversampling of large firms therefore causes its operating rate to overstate the amplitude of cyclical swings, and this offsets a portion of the survey-response bias, which caused the amplitude of cyclical swings to be understated. In other words, McGraw-Hill's large-firm bias negates some of the bias arising from firms "losing" capacity in recessions and "finding" it in recoveries. The BEA operating rate, in contrast, has less of a sampling bias with which to cancel its survey-response bias. As a result, the BEA has a larger

cyclical bias than McGraw-Hill.[21]

To summarize, none of the major indexes of capacity utilization are without fault. Because the Wharton index is incapable of determining the current rate of capacity growth, its current estimates of capacity utilization are unreliable; they may be drastically revised in the future. The FRB index appears to be reasonably reliable as long as the statistical relationships on which it is based are kept up to date. When a given statistical relationship is extrapolated very far, however, a bias is likely to emerge. The BEA operating rate contains a cyclical bias, causing it to vary much less over the cycle than the other measures of capacity utilization. Finally, the McGraw-Hill operating rate contains two cyclical biases. These are partially offsetting, however, so that the McGraw-Hill cyclical bias is less severe than the BEA bias. While all four measures of capacity utilization contain flaws, the FRB measure is perhaps the best when it comes to estimating how much of the economy's aggregate capital stock is currently being utilized. Unlike the McGraw-Hill and BEA rates, the FRB measure has no apparent cyclical bias. Furthermore, its current values seem more reliable than those of Wharton.

The current situation
Having discussed the various measures of capacity utilization, a final question remains: What is the current capacity situation in manufacturing? Now that the

[20] Another reason for expecting some divergence between McGraw-Hill and BEA operating rates is that they do not rely on survey data to the same extent. The McGraw-Hill value is derived from an annual survey of capacity utilization as well as from figures on industrial production; the BEA value comes exclusively from a quarterly survey.

[21] From the perspective of current analysis, the McGraw-Hill operating rate has another advantage over the BEA rate: its values are released much sooner. For example, the BEA 1976-II figures were not available until September 29, whereas those of McGraw-Hill were released on July 23.

Table 2
Magnitudes of Cyclical Swings in the BEA Operating Rate
By firm size;* in percentage points

Industry	1968-69 peak to 1970-71 trough	1970-71 trough to 1973 peak	1973 peak to 1975 trough	1975 trough to 1976-II	Total movement 1968-1976-II
Total manufacturing:					
Large firms	8	9	13	9	39
Small firms	7	7	9	5	28
Durables manufacturing:					
Large firms	12	13	14	11	50
Small firms	9	10	13	6	38
Nondurables manufacturing:					
Large firms	4	5	14	6	29
Small firms	5	5	6	3	19

* Large firms: company assets of $100.0 million and over; small firms: company assets of under $10.0 million.
Source: United States Department of Commerce, Bureau of Economic Analysis.

FRB utilization numbers have been revised, there emerges something approaching a consensus among utilization measures. All four manufacturing series indicate that approximately 40-60 percent of the decline in utilization over the 1973-75 period has been recouped (see Table 3). By historical standards as well, present capacity utilization appears to be somewhere around midrange. The current McGraw-Hill and FRB values indicate that capacity utilization is slightly closer to the historical lows than to the historical highs of their series; the current Wharton and BEA values indicate the reverse. On an aggregate level then, the manufacturing sector appears to possess ample unused capacity. But, as noted earlier, it is important to consider utilization at more disaggregative levels as well. Capacity constraints could develop in certain subsectors despite abundant capacity elsewhere.

Disaggregation reveals that capacity is not a problem in either durables or nondurables manufacturing. The rebound in capacity utilization from the 1975 trough has been somewhat stronger percentagewise in the durables sector according to BEA, somewhat stronger in nondurables according to Wharton, and about equally strong in both sectors according to McGraw-Hill. But, while there is some discrepancy as to the relative rebound in the two sectors, one conclusion that does emerge is that neither sector is currently approaching capacity.

The FRB utilization rates are not available for the durables and nondurables categories but are available along stage-of-processing lines. According to these numbers, considerable untapped capacity remains in both the primary-processing and advanced-processing sectors. Since 1975, utilization rates in both sectors have regained just over half of the decline registered between 1973 and 1975.

The Board also publishes a separate series on utilization in the materials sector because of "the strategic importance of materials capacity in limiting overall industrial production".[22] According to this index, materials capacity remains ample. As of 1976-III, just under 50 percent of the reduction in utilization between 1973 and 1975 had been regained (see Table 4). The increase in utilization has been relatively stronger in the nondurables sector, but there still remains substantial capacity there. Indeed, utilization in nondurables is lower now than it was last spring.

The finding of substantial unused capacity in manufacturing seems to hold at the industry level as well. While the latest (1976-II) BEA readings suggested possible tightness in the automotive industry, recent data on automobile production and sales indicate that auto-

[22] Raddock and Forest [15, page 899].

Table 3
Past and Current Capacity Utilization Rates

Series*	Historical high	Historical low	Current value	1973 peak	1975 trough
Wharton	97.5	74.7	88.0	97.5	77.4
FRB	91.6	70.9	80.9	87.8	70.9
McGraw-Hill .	89.5	71.3	77.7	86.5	71.3
BEA	86	75	82	86	75

* The Wharton historical series runs from 1947-I to 1976-III, the FRB series from 1948-I to 1976-III, the McGraw-Hill series from 1964-IV to 1976-III, and the BEA series from 1967-IV to 1976-II.

Table 4
Past and Current Federal Reserve Board Capacity Utilization Rates for Industrial Materials
Series run from 1967-I to 1976-III

Sector	Historical high	low	Current value	1973 peak	1975 trough
Total	92.9	70.7	81.3	92.9	70.7
Durables	92.3	64.6	78.3	92.3	64.6
Basic metals ...	97.5	67.0	81.7	97.5	67.0
Nondurables	94.0	69.9	85.2	93.9	69.9
Textiles	93.9	60.1	81.9	93.9	60.1
Paper	99.5	73.5	90.2	99.5	73.5
Chemicals	93.2	67.2	83.0	93.2	67.2

Table 5
Past and Current McGraw-Hill Capacity Utilization Rates
Monthly series run from September 1964 to October 1976

Selected industries	Historical high	low	Current value	1973 peak	1975 trough
Machinery	94.5	71.0	74.5	86.0	71.0
Electrical machinery ..	93.5	60.5	71.0	82.5	60.5
Fabricated metals	91.0	67.5	76.5	81.5	68.0
Chemicals	85.5	68.5	77.5	85.5	68.5
Paper	95.0	70.5	82.5	94.5	70.5
Rubber and plastics ...	103.5	66.5	93.5	97.0	66.5
Petroleum refinery	98.0	85.5	88.0	97.5	85.5
Nonferrous metals	101.5	60.0	83.0	90.5	60.0
Textiles	98.0	62.0	79.5	91.5	62.0

motive capacity should prove sufficient over the coming year. According to McGraw-Hill, no industry faces impending capacity constraints. At first sight, the 88 percent utilization rate in petroleum refining might appear high, but utilization in this industry is always above the manufacturing average. The utilization rate for petroleum refining has never fallen below 85.5 percent, and has reached 98 percent (see Table 5). Rubber and plastics is the only other manufacturing industry to have a McGraw-Hill operating rate above 83 percent in October, but its high current rate appears related to the recent rubber strike. As soon as the strike ended, companies sought to catch up on lost production, and the operating rate for the rubber and plastics industry shot up 11 percentage points. Once the backlog of orders is reduced to more normal levels, however, the operating rate is likely to decline. Moreover, its current value is still 10 points below its all-time high. Although capacity utilization in the nonferrous metals industry is not too far below its 1973 peak, it remains well below its historical high.

Last spring some forecasts were made that capacity problems might soon develop in a number of key industries. Among the industries most frequently mentioned were paper, textiles, chemicals, and steel. Since that time, capacity in a majority of these industries has been expanding faster than production. According to monthly McGraw-Hill operating rates, capacity utilization in the paper industry declined from 89.0 percent earlier this year to 82.5 percent in October. Capacity utilization in textiles fell from 84.5 percent to 79.5 percent, and capacity utilization in chemicals fell·from 80.5 percent to 77.5 percent. While capacity utilization in the steel industry generally increased over the first eight months of the year, it declined in September and again in October. With new orders for capital goods not picking up as expected, demand for structural steel remains soft. Only the market for sheet steel has been strong, and that is because of the pickup in automobile production. Yet even for sheet steel, no capacity problems are anticipated in the near future. Thus, since last spring the threat of impending capacity shortages seems to have dissipated.
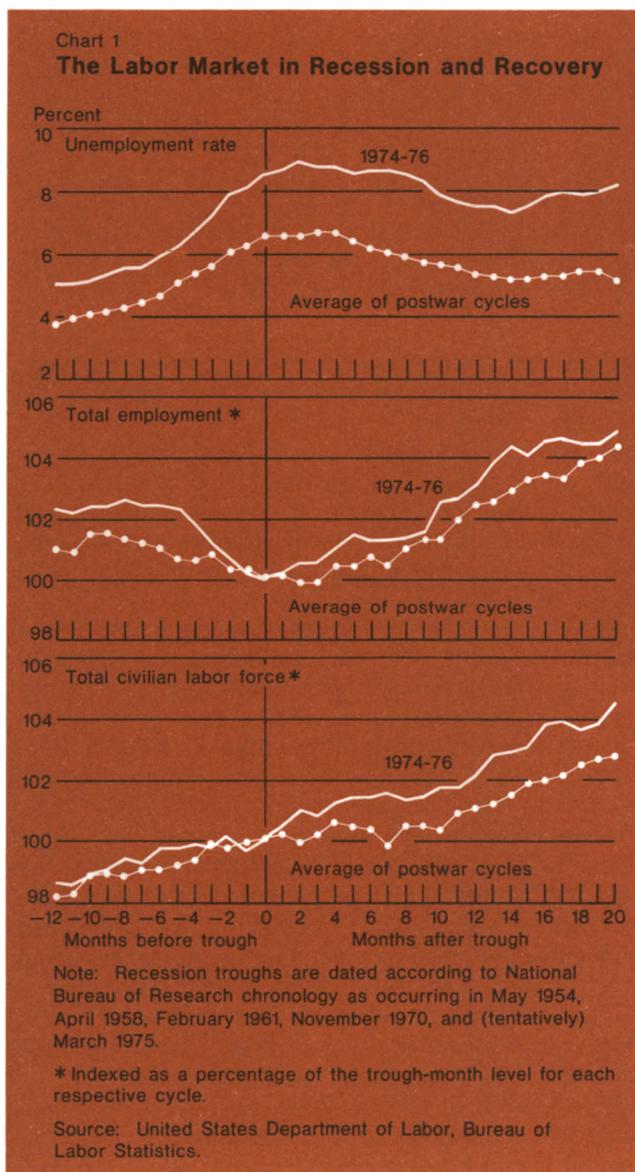
The conclusion to be drawn is that the manufacturing sector is operating considerably below its productive limits. How long before capacity will become a problem depends on future rates of production as well as on the rate at which capacity-augmenting investment is undertaken. But, at least for the near term, production is unlikely to be hindered by capacity constraints. While not ruling out the possibility of bottlenecks in isolated product lines, capacity throughout the manufacturing sector should prove to be ample over the next year or so.

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The business situation
Current developments

Chart 1

The Labor Market in Recession and Recovery

Note: Recession troughs are dated according to National Bureau of Research chronology as occurring in May 1954, April 1958, February 1961, November 1970, and (tentatively) March 1975.

* Indexed as a percentage of the trough-month level for each respective cycle.

Source: United States Department of Labor, Bureau of Labor Statistics.

The prolonged "pause" in the rate of economic advance appeared to have continued into the fourth quarter. The economy's resistance to the resumption of a more vigorous rate of expansion has necessarily increased uncertainties over the outlook. Nevertheless, the danger of the economy moving into outright recession in the near future seems small. The current recovery is still relatively young by the standards of postwar business cycles and thus far has been marked by few of the stresses and strains that typically precipitate downturns. Indeed, the current episode of consolidation could lay the foundation for a prolonged period of gradually increasing prosperity.

The pace of the recovery from the 1973-75 recession has not been abnormal, compared with other economic recoveries since the Korean war. Measured from the apparent trough in the first quarter of 1975, real gross national product (GNP) increased 7.3 percent during the first four quarters of recovery. This gain was slightly faster than the average increase of 7 percent during the first year of the four preceding cyclical recoveries—those beginning in 1954, 1958, 1961, and 1970. Even the much discussed "pause" in the rate of expansion during the past two quarters was normal. The 4.1 percent annual rate of real GNP growth during the second and third quarters of 1976 was actually slightly faster than the 3.7 percent increase averaged during the second year of the four preceding recoveries. Hence, another quarter or two of slowdown in the rate of economic growth would not be at all unusual and would not necessarily presage an early end to the expansion. Only one of the four previous periods of expansion was as short as eight quarters; the average length was seventeen quarters.
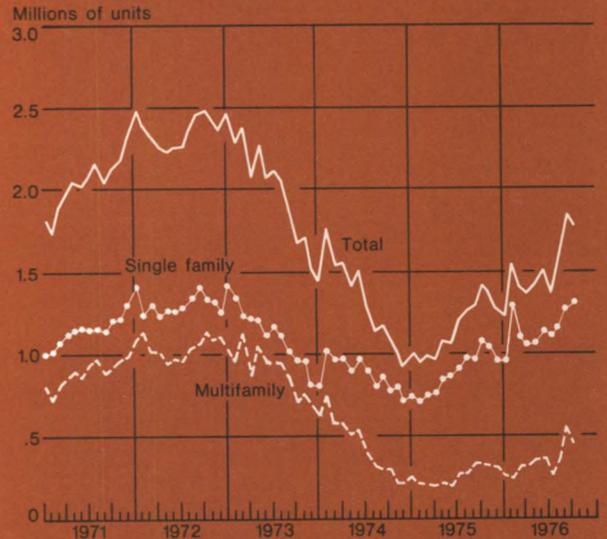
What is distinctive about the current recovery is the relatively low rate of resources utilization. The newly revised Federal Reserve Board index of manufacturing

Chart 2
Retail Inventories
Seasonally adjusted
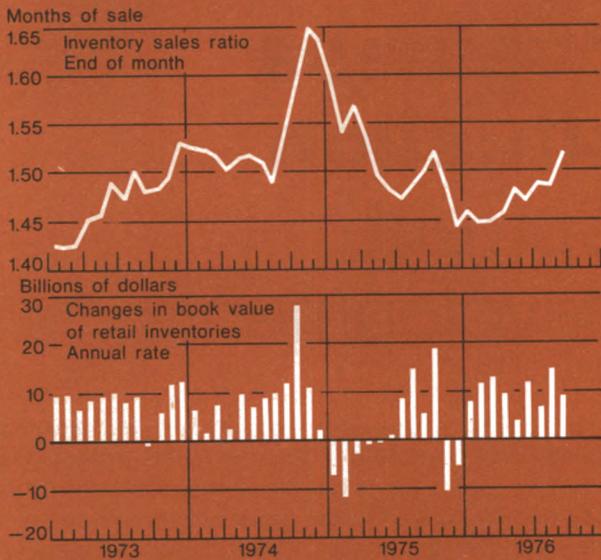
Source: United States Department of Commerce, Bureau of Economic Analysis.

Chart 3
Private Housing Starts
Seasonally adjusted annual rates

Source: United States Department of Commerce, Bureau of the Census.

capacity indicated a utilization rate of 79.8 percent in October, 8 percentage points below the recent peak in the third quarter of 1973. At a comparable stage of the four preceding cyclical recoveries, capacity utilization in manufacturing averaged close to 84 percent according to this measure (see the article on pages 13-20 of this *Review*). Much more striking is the underutilization of manpower. The unemployment rate was 8.1 percent in November, only 0.8 percentage point below the recent high reached in the spring of 1975. After twenty months of expansion in the four previous cycles, the unemployment rate averaged 5.1 percent, which represented an average decline of 1.6 percentage points from the respective cyclical peaks in the unemployment rate (see the top panel of Chart 1).

The persistence of high rates of unemployment has not resulted from unusually slow growth of employment during the current recovery. Indeed, as may be seen in the middle panel of Chart 1, total employment has increased somewhat more during the current recovery than on average during the four preceding recoveries. In large measure, the current high rate of unemployment reflects the severity of the last recession, which pushed the jobless rate to the highest level since World War II. It also reflects the unusually rapid growth of the labor force during much of the current expansion. As can be seen in the bottom panel of Chart 1, the total civilian labor force increased 4.4 percent dur-

ing the first twenty months of the current recovery, which was much faster than the 2.7 percent average increase during the comparable period of the last four recoveries. Another influence contributing to the high overall rate of unemployment has been the continuing shift in composition of the work force toward groups that characteristically experience relatively high rates of unemployment (see the article on pages 24-30 of this *Review*).

The stumbling of the economy early in the fourth quarter was exemplified by developments in industrial output. After advancing for seventeen consecutive quarters, industrial production, as measured by the Federal Reserve Board's index, dipped slightly in September and then declined by a more pronounced 0.5 percent in October, according to preliminary data. While the September dip largely reflected the effects of the strike of the United Auto Workers against the Ford Motor Company, the October decline was more generalized. Declines in production were common among materials and manufactured products, including business equipment and consumer goods. These production cutbacks undoubtedly reflected attempts of firms to trim inventories, or to keep inventories from increasing, in the face of disappointing sales.

A periodic data revision released in November indicated that the level of retail inventories was about 3½ percent higher than previously thought. While the Sep-

tember rise in stocks was not unusually large, sales slipped and the ratio of retail inventories to sales rose to the level of April 1975 when the economic recovery was just getting under way (see Chart 2). Inventory excesses in some lines are suggested by scattered indicators such as preseason sales of various consumer goods and rebates on some subcompact automobiles. However, existing excesses appear neither widespread nor overwhelming. Most firms seem to feel they have their stocks under reasonable control, and the swiftness with which firms cut back orders when stocks appear to be getting out of line should help prevent inventory excesses from cumulating. If demand were to fall off drastically, however, the picture could turn around abruptly—as happened in late 1974.

The likelihood of a sharp drop in demand appears slim. Indeed, while there are no conclusive signs of a rejuvenation of the economic expansion, a number of indicators point in that direction. Retail sales rebounded in October and November after several months of sluggishness. Nonfarm payroll employment posted a sizable increase in November, as did hours of overtime and the average workweek in manufacturing. Housing starts and permits rose sharply in September and held on to most of those gains in October. Especially impressive was the performance of single-family home building. Single-family home starts in October were only a shade below the best months of 1972 and early 1973 (see Chart 3). Ample funds are available to finance increased home-building activity, as banks and thrift institutions continue to enjoy large inflows of savings attracted by deposit rates that are more generous than returns available on short-term market obligations such as Treasury bills (see article on pages 33-39 of this *Review*). Capital spending by business is another sector that may be poised for a significant advance. Several early private surveys indicate an increase in planned outlays for plant and equipment of about 6 to 7 percent in real terms in 1977. Continued sizable increases in new orders for capital goods appear to be consistent with these plans, although the Commerce Department's survey of plant and equipment spending plans for the first half of 1977 suggests a smaller rate of advance.

One development that could deal a severe blow to the nation's economic expansion would be a resurgence of accelerating inflation, but it appears that such a resurgence can be avoided. The United States has made great strides during the past two years in reducing inflation. As measured by the consumer price index (CPI), for instance, the rate of inflation has been reduced from 12 percent in 1974 to 5½ percent during the past year. To a considerable extent, however, this

impressive record reflects the winding down of a combination of extraordinary developments that pushed prices sharply higher in 1973 and 1974. Further progress in reducing inflation is likely to be much more gradual and more difficult to achieve. The 0.3 percent increase in the CPI in October probably understated the ongoing pace of inflation. The overall index was held down by stable food prices which translated into a very modest price rise after seasonal adjustment. Such stability in food prices cannot be expected to continue indefinitely, although the Department of Agriculture foresees only a moderate rise at least through mid-1977. The remainder of the CPI increased in October at an annual rate of 5½ percent, the same as the growth rate of the overall index during the past four quarters.

If the CPI numbers for October tended to understate the ongoing rate of inflation, the wholesale price index (WPI) for the past several months has almost certainly exaggerated the strength of inflationary forces in the marketplace. During the past three months, September through November, prices measured by the industrial wholesale price index have increased an average of 0.9 percent per month. It might be recalled that a similar bulge at the same time last year was followed by several months of much more modest increases. There could be problems with the seasonal adjustment of these data, relating in part to the annual increases in new car and truck prices that accompanied the introduction of the new models as well as other factors. Nearly half the increase in industrial wholesale prices in October and November was accounted for by power and fuel. In large measure, these increases reflected the effects on energy prices of regulatory changes— the increase by the Federal Power Commission in ceiling prices for natural gas sold across state lines beginning in late July and the decontrol in September by the Federal Energy Administration of crude oil from certain marginal wells. Due to the usual reporting lags, as well as continuing adjustments of prices to these regulatory changes, the effects of these events showed up in the WPI in October and November. Reported prices of other industrial commodities rose an average of 0.5 percent per month, seasonally adjusted, during those two months. Because of the difficulties inherent in measuring actual transactions prices in periods of changing demand conditions, it is likely that the effective prices at which a number of industrial commodities actually traded—taking account of discounts and special allowances—were somewhat weaker than indicated by the WPI. Moreover, it is not certain that recent increases in posted prices of some metals and fibers will withstand the test of the market.

The changing composition of the labor force

by Sharon P. Smith

The persistence of relatively high unemployment rates through good times and bad in recent years raises the question of whether some structural change in labor supply may be adding to the unemployment created by recession. It does appear that the composition of the labor force[1] has changed so that a larger proportion of it now is composed of demographic groups (in particular, women and teenagers) who tend to experience relatively higher rates of unemployment. The old image of a labor force largely composed of adult men has become increasingly inappropriate as differences in labor force participation rates of different demographic groups have narrowed. Thus, the labor force participation rates of females and teenagers have increased, and that of males has decreased. Moreover, this rapid rise of labor force participation among demographic groups traditionally regarded as sources of "secondary" workers has continued during a period in which high levels of cyclical unemployment might be expected to deter entrance into the labor force. The recent and apparently continuing changes in the composition of the labor force seemingly have tended to raise the average level of overall unemployment associated with given cyclical conditions. A corollary appears to be that the level of unemployment associated with a state of 'full employment"—whatever that somewhat elusive concept may mean—is now somewhat higher than in the earlier postwar period.

This article focuses on the major changes that have occurred in the composition of labor force participants

and the forces that have brought about these changes during the postwar period. Attention also is directed briefly to the impact of the changing patterns of labor force participation on the size and composition of unemployment.

Growth and changing patterns of labor force participation

The overall labor force participation rate for all demographic groups, 16 years of age and older, remained fairly stable from the late 1940's through the early 1960's, fluctuating between 57.0 percent and 58.3 percent (see Chart 1). Since 1964, however, there has been a persistent rise in the participation rate. In 1969 it reached a record 58.6 percent, and by 1975 it had moved up further to 60.4 percent.
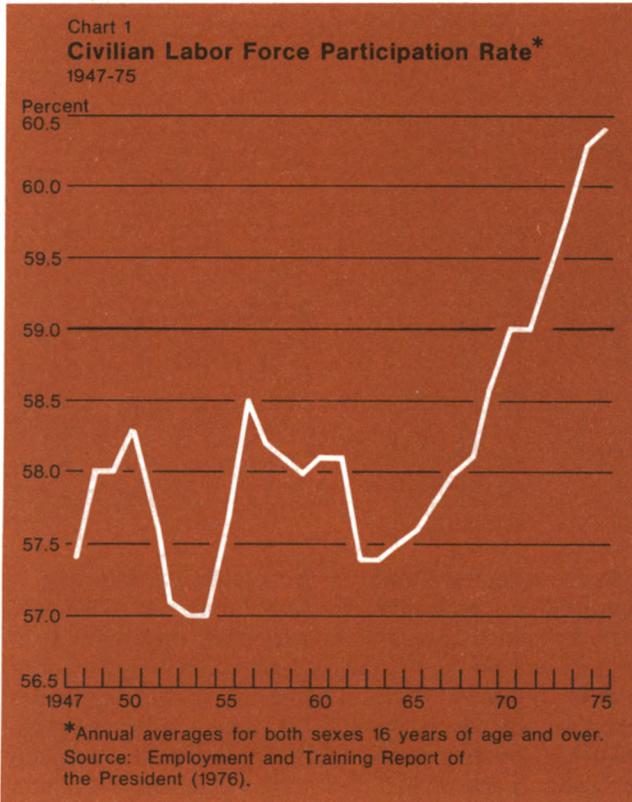
Although these figures do indicate that a steadily rising proportion of the noninstitutional population is counted in the civilian labor force, the overall increase since 1947 has been a modest 3 percentage points.[2] Nevertheless, this small overall increase masks changes of much larger magnitude in the labor force participation patterns of the major component demographic groups. The three groups exhibiting the most important changes are married women living with their husbands ("spouse present" in the language of the Census Bureau), older men, and teenagers.

The changing role of women in the labor force

The participation of women in the labor force has

Chart 1
Civilian Labor Force Participation Rate*
1947-75

*Annual averages for both sexes 16 years of age and over.
Source: Employment and Training Report of
the President (1976).

Table 1
Median Age at First Marriage

Year	Female	Male
1940	21.5	24.3
1950	20.3	22.8
1960	20.3	22.8
1965	20.6	22.8
1970	20.8	23.2
1972	20.9	23.3
1973	21.0	23.2
1974	21.1	23.1

Source: United States Department of Commerce, *Statistical Abstract of the United States 1975.*

grown in recent years for all major groups regardless of marital status and the ages of their children. As might be expected, participation rates for married women tend to be lower than those of unmarried women, with rates for women who are married but not living with their husbands falling in between. Interestingly, however, while the participation rates of all three groups have risen, the differences have narrowed (see Chart 2). Thus, by far the largest increase has occurred for married women living with their husbands. Their participation rate rose from 20 percent in early 1947 to 44.4 percent in early 1975.

Just as important as marital status in influencing the probability of a woman's participation in the labor force are the number and ages of her children. In particular, the presence of small children is obviously an important deterrent to participation in the labor force. Chart 3 shows labor force participation rates for married women living with their husbands by the ages of their children. The most important distinction here is between those women with children under 6 years of age and those with children over 6 years of age. As with the breakdown by marital status, there has been an increase in participation rates for all categories, and again the distinctions among the major categories generally have tended to shrink over the years. Thus, the observed rise in labor force participation is not concentrated among those who are childless. Nor has it occurred only for women with children over age 6. Rather, it appears that labor force participation of all married women living with their husbands has increased.

One possible explanation for this major rise in labor force participation among married women is that the younger generation has a significantly different outlook toward market work (in contrast to housework) than earlier generations. However, an examination of changes in labor force participation rates by sex and age, shown in Chart 4, indicates that these patterns are consistent across the two younger age groups and are not the result of unusual behavior of a particular group as it ages.

Among females, labor force participation rates increased enormously for each age category except those 65 and over. The largest increase occurred among women between 25 and 34 years old. Although females between the ages of 20 and 24 remain the group with the highest labor force participation rate, the differences between the age groups generally have narrowed between 1955 and 1976.[3] Therefore, it appears that the increase in female labor force participation is

[3] The only exception is the widened difference between the labor force participation rate for the 55 to 64 age group and that for the 65 and over age group.

a consequence of factors that affect all age groups and not just one particular generation or one particular age group.

Before considering some of the factors that have brought about these changes in the participation of women in the labor force, it is worthwhile to look at the equally striking but quite different changes in the labor force participation of men. First, there has been a *decrease* between 1955 and 1975 in the participation rates of all age categories of adult men—i.e., other than male teenagers. While the amount of the decrease for those categories under age 55 has been fairly slight, the decreases in the two oldest categories have been quite large. The total labor force participation rate for men 55 to 64 years old fell from 87.9 percent in 1955 to 75.8 percent in 1975, while that for men 65 and over fell from 39.6 percent in 1955 to 21.7 percent in 1975.

Why female labor force participation has increased

Several factors have been influential in the rise in female labor force participation. The increased willingness of married women (with spouse present) to continue working can be attributed in part to a trend toward later marriages and a decrease in the birth

Chart 2
Labor Force Participation Rates
By sex and marital status, 1947-75

Source: Employment and Training Report of the President, (1976).

Table 2	
Birth Rate 1940-73	
Per 1,000 population	

Year	Birth rate
1940	19.4
1950	24.1
1960	23.7
1965	19.4
1970	18.4
1971	17.2
1972	15.6
1973	14.9

Source: United States Department of Commerce, *Statistical Abstract of the United States 1975.*

rate (see Tables 1 and 2). With later marriages, it is more likely that women will have obtained skills and training that increase their expected wage and thus the attractiveness of having a job. Similarly, the decrease in the birth rate reduces the probability of the presence of young children to act as a deterrent to married women's labor force participation. Although the median age of 21.5 at first marriage was quite high in 1940, this was probably a consequence of the depression. In 1950 the median age had dropped to 20.3 and remained at that level in 1960. The median marriage age began to rise again in the 1960's and by 1974 had reached 21.1. Meanwhile, the birth rate was declining from a high of 24.1 (per 1,000 population) in 1950 to 14.9 in 1973.

Another factor tending to raise female participation rates was the rise in education levels. Actually, education rates rose for both men and women during the period and the increase was greater for men (see Table 3). There is good reason to expect increased education to result in rising labor force participation. The reason is simply that education tends to increase attainable earnings levels and therefore increases the attractiveness of holding a job relative to homemaking and other nonmarket activities.

These three factors—an increase in age at first marriage, a decline in the birth rate, and increased educational attainment—alone would have increased female labor force participation. In addition, however, clearly there has been a marked change in social attitudes and expectations toward women working. Thus, for any given set of circumstances (particular marital status, number and age of children, education level), the probability that a woman is in the labor force is greater today than it was twenty, or even ten, years ago.
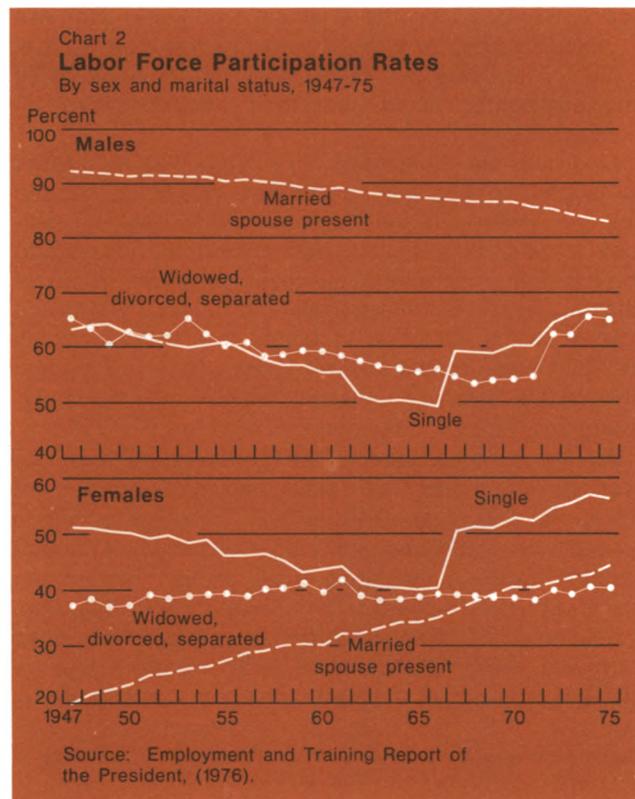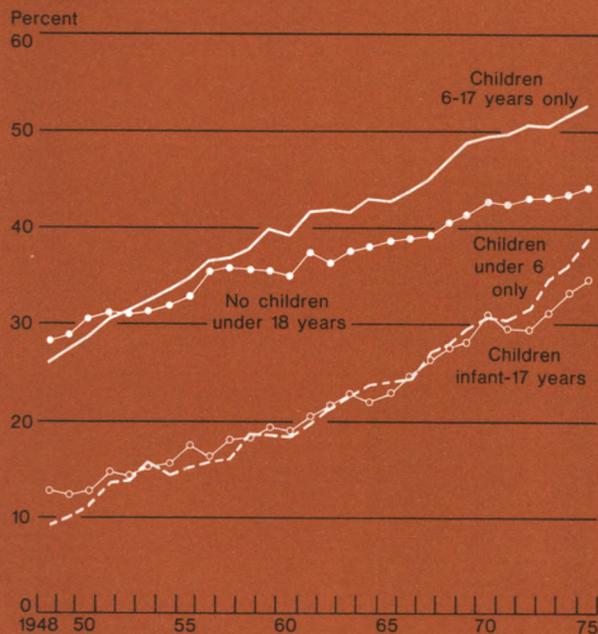
Chart 3
Labor Force Participation Rates of Married Women, Husband Present
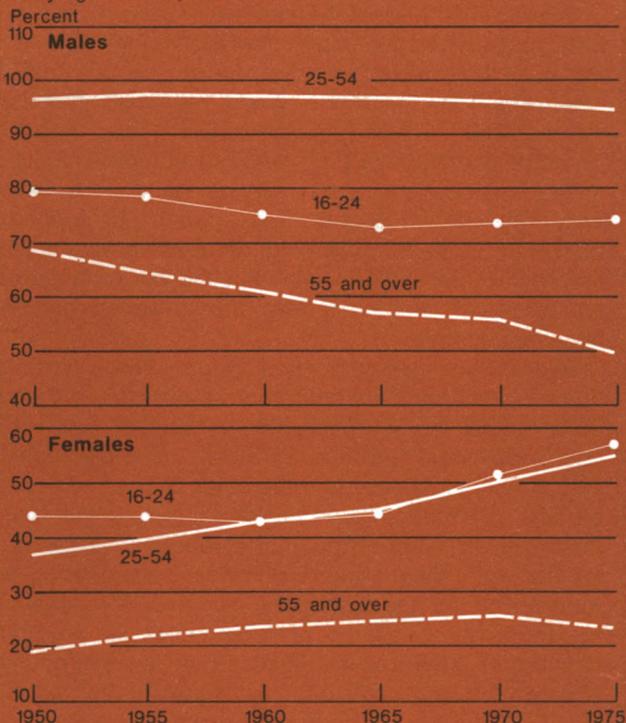By presence and age of children, 1948-75

Source: Employment and Training Report of the President (1976).

Chart 4
Labor Force Participation Rates*
By age and sex, 1950-75

* Includes armed forces.
Source: Employment and Training Report of the President (1976).

Adult males and teenagers

The decline in the male labor force participation rate already mentioned reflects a rise in age at first marriage, an increasing trend to earlier retirements, and an increase in disability. The last two factors are important in explaining why the fall in male labor force participation rates has been concentrated in the older age categories. Years in retirement appear to be increasing in part because of a rise in longevity. In addition, there has been a decrease in male labor force participation due to better pension plans, to more liberal social security payments and other Government benefits, and to the increase in working wives. It has been estimated that, between 1960 and 1970, male life expectancy rose from 66.8 to 67.1 years while "work expectancy" fell from 41.1 to 40.1 years.[4]

It is not clear to what extent the rise in disability might reflect an increase in debilitating illnesses and to what extent it has resulted from the liberalization of Government benefits. Amendments to the social

[4] See Fullerton and Byrne [4, page 32].

security law in 1956 and 1960 extended disability benefits to individuals under 50 years of age. Moreover, the definition of disability was changed in a 1965 amendment from an anticipated "permanent" or "long-term" disability to a disability with "expected duration of at least 12 months". As many as 78.3 percent of the newly eligible recipients of disability benefits between the ages of 25 and 50 may be in this category because of these revisions in disability benefits (and not because of an increase in the incidence of disability).[5]

A third major change in the pattern of labor force participation has been the rapid rise in teenager participation. Participation rates have risen for both sexes, though the increase has been sharper for females. The total labor force participation rate for males aged 16 to 19 actually fell between 1960 and 1970 (from 58.6 per cent to 57.5 percent) but then rose to 60.9 percent in 1975. The labor force participation rate for teenage females, on the other hand, grew irregularly from 39.1 percent in 1960 to 49.3 percent in 1975. This overall

[5] See Gastwirth [5, page 45].

growth in teenage labor force participation rates between 1960 and 1975 probably reflects, in part, the recent drop in college enrollments.

Beyond this, part of the very recent rise in the labor force participation of both married women and teenagers (of both sexes) may be due to the fact that unemployment in the most recent recession has been concentrated in the predominately male industries (principally manufacturing) while the predominately female industries (principally service) continue to experience employment growth. The entrance of secondary workers into the labor force under these circumstances may reflect an effort to maintain the household's customary standard of living when the household head has become unemployed.[6]

Overall, the changing rates of labor force participation for adult females, adult males, and teenagers have occurred in the wake of higher market wage rates, later marriages, lower birth rates, increased pension and disability benefits, and the other changes discussed earlier. In addition, however, the fact that the largest increases in labor force participation have occurred for the secondary workers (married women living with their husbands and teenagers) suggests the possibility of increased household preference for the pecuniary rewards of market work (in place of the nonpecuniary rewards to such activities as work in the home or leisure). Such a shift in preferences would be very difficult to document, however.

Changing composition of the labor force and unemployment

The result of these different patterns of labor force participation of older men, married women, and teenagers has been continuing change in the composition of the civilian labor force during the last twenty-five years. Males, 16 years and older, constitute a steadily decreasing proportion of the civilian labor force, falling from 70.4 percent in 1950 to 60.1 percent in 1975, and females, 16 years and older, a correspondingly increasing proportion, rising from 29.6 percent in 1950 to 39.9 percent in 1975 (see Table 4). Teenagers of both sexes, of course, have become a larger proportion of the labor force over this period. Moreover, the Bureau of Labor Statistics projects a continuation of

[6] The income earned by working wives constitutes a significant proportion of total family income, so that "secondary worker" may be a somewhat misleading label. The exact percentage varies with the wife's work experience and status (full or part-time worker). It has been estimated that in 1974 when the wife worked full time for fifty to fifty-two weeks during the year, the median family income was $17,500, and the median proportion the wife contributed to that income was 38 percent. Even where the wife worked part time or full time for one to twenty-six weeks during the year, she contributed 12 percent to a median family income of $13,500. See Hayghe [6, page 17].

Table 3

Median Years of School Completed

Year*	Female	Male
1952	12.0	10.4
1957	12.1	11.1
1959	12.2	11.5
1962	12.2	12.0
1964	12.3	12.1
1965	12.3	12.2
1966	12.3	12.2
1967	12.3	12.2
1968	12.4	12.3
1969	12.4	12.3
1970	12.4	12.4
1971	12.5	12.4
1972†	12.4	12.4
1973	12.5	12.4
1974	12.5	12.5

* October survey for 1952 and March surveys for all other years.
† Beginning 1972, data refer to persons 16 years of age and over, other years are aged 18 and over.
Source: United States Department of Labor, *Handbook of Labor Statistics 1975—Reference Edition.*

Table 4

Composition of the Civilian Labor Force

Actual percentage distribution

Sex and age group	1950	1960	1970	1975
Total men, 16 years and over	70.4	66.6	61.9	60.1
16 to 24 years	11.5	9.9	11.7	13.1
16 to 19 years	4.0	4.0	4.8	5.1
20 to 24 years	7.4	5.9	6.9	8.0
25 to 54 years	45.7	44.2	38.9	37.3
55 years and over	13.3	12.5	11.2	9.6
55 to 64 years	9.3	9.2	8.6	7.5
65 years and over	3.9	3.3	2.6	2.1
Total women, 16 years and over	29.6	33.4	38.1	39.9
16 to 24 years	7.1	6.7	9.8	10.9
16 to 19 years	2.8	3.0	3.9	4.4
20 to 24 years	4.3	3.7	5.9	6.6
25 to 54 years	18.6	21.1	22.0	23.3
55 years and over	3.9	5.6	6.3	5.7
55 to 64 years	3.0	4.3	5.0	4.6
64 years and over	0.9	1.3	1.3	1.1

Source: United States Department of Labor, *Employment and Training Report of the President* (1976).

many of these patterns to 1990, although the projected rates of change are slower than have occurred over the past quarter century.

Thus, an increasing proportion of the labor force is composed of those demographic groups that historically have experienced relatively higher rates of unemployment than adult males. Table 5 shows that despite changes in the composition of the labor force, the general structure of unemployment—i.e., the relative unemployment rates for different age and sex groups—has remained fairly stable over time. Thus, in all years the highest unemployment rates have occurred for teenagers of either sex. However, while the male teenage unemployment rate was the higher of the two through the 1950's and 1960's, the rate for females now appears somewhat greater. These higher unemployment rates for teenagers reflect in part their relatively lower levels of skill and experience; teenagers are more likely to be laid off. They also are more likely to be moving into and out of the labor force because of discouragement with respect to job prospects and because of more probable movement into and out of school. Moreover, they may move among jobs as they search for a satisfactory position.

In the adult categories, a consistent pattern appears.

In the youngest age group, 20 to 24 years, and in the oldest age group, 55 and over, male unemployment rates are generally higher than female rates while in the middle ages, 25 to 54 years, female unemployment rates are higher. This pattern probably reflects the typical discontinuous labor force participation of women who periodically withdraw from the labor force to engage in child care or because they have become discouraged about finding a job. They then experience additional difficulties in finding a job as reentrants whose job skills may have depreciated during their period of withdrawal from the labor force. In fact, it has been estimated that the "high rate at which employed women leave the labor force... is the main factor in the higher unemployment rates they experience".[7]

Because of these changes in the composition of the labor force, it appears that "full employment"—however this is interpreted—for the American economy is likely to imply a higher level of total unemployment today than it would have some years ago.[8] This does

[7] See Marston [8, pages 179-82].

[8] It is important to note that this discussion abstracts from the effect that liberal unemployment compensation may have in increasing the level and duration of unemployment. Consideration of this factor is beyond the scope of this analysis.
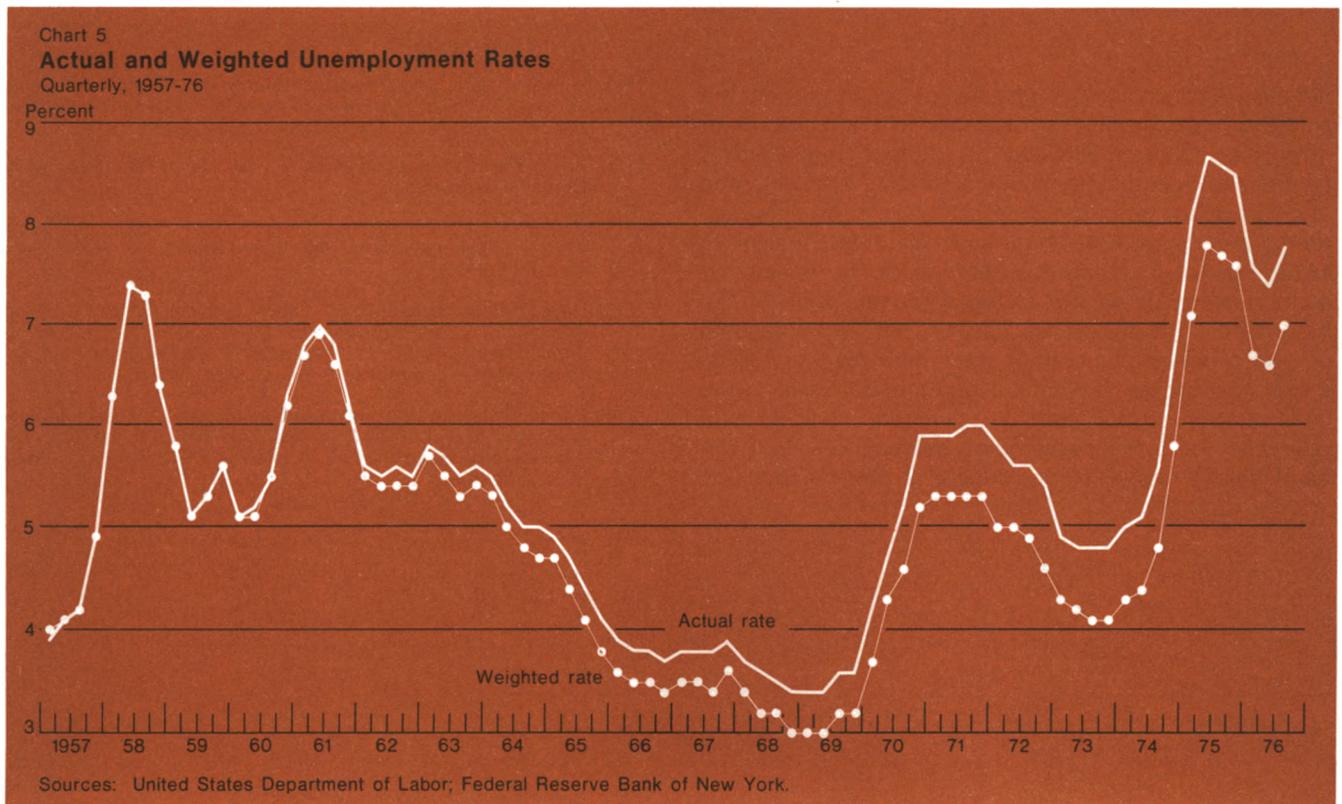
Chart 5
Actual and Weighted Unemployment Rates
Quarterly, 1957-76

Sources: United States Department of Labor; Federal Reserve Bank of New York.

Unemployment Rates by Sex and Age

Sex and age group	1950	1955	1960	1965	1970	1975
Total men, 16 years and over ...	5.1	4.2	5.4	4.0	4.4	7.9
16 to 17 years	13.3	12.5	15.5	16.1	16.9	21.6
18 to 19 years	12.3	10.8	15.0	12.4	13.4	19.0
20 to 24 years	8.1	7.7	8.9	6.3	8.4	14.3
25 to 34 years	4.4	3.3	4.8	3.0	3.4	7.0
35 to 44 years	3.6	3.1	3.8	2.6	2.4	4.9
45 to 54 years	4.0	3.2	4.1	2.5	2.4	4.8
55 to 64 years	4.9	4.3	4.6	3.3	2.8	4.3
65 years and over ...	4.8	4.0	4.2	3.5	3.3	5.4
Total women, 16 years and over ...	5.7	4.9	5.9	5.5	5.9	9.3
16 to 17 years	14.2	12.0	15.4	17.2	17.4	21.2
18 to 19 years	9.8	9.1	13.0	14.8	14.4	18.7
20 to 24 years	6.9	6.1	8.3	7.3	7.9	12.7
25 to 34 years	5.7	5.3	6.3	5.5	5.7	9.1
35 to 44 years	4.4	4.0	4.8	4.6	4.4	6.9
45 to 54 years	4.5	3.6	4.2	3.2	3.5	5.9
55 to 64 years	4.5	3.8	3.4	2.8	2.7	5.1
65 years and over ...	3.4	2.3	2.8	2.8	3.1	5.1

Source: United States Department of Labor, *Employment and Training Report of the President* (1976).

not mean that presently high rates of unemployment are solely or even largely attributable to changing labor force participation. However, it is clear from Chart 5 (which shows actual unemployment rates and weighted unemployment rates for constant labor force composition quarterly from 1957 through the third quarter of 1976) that an increasing proportion of the unemployment rate is due to the changing composition of the labor force. The difference between the two measures of unemployment was rather small until the late 1960's. It has now grown to almost 1 percentage point. In the third quarter of this year the weighted unemployment rate was 0.8 percentage point below the actual unemployment rate. Further changes in the composition

of the labor force in the same direction may be expected to have similar effects on the average level of the overall unemployment rate under given economic conditions.

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The financial markets
Current developments

The broad decline in interest rates which began early in the summer extended into the fall. Growth in economic activity has remained modest in recent months and, under these circumstances, the Federal Reserve accommodated a further easing in interest rates without fundamentally altering the basic thrust of monetary policy. While the debt markets were somewhat hesitant in October, perhaps because of uncertainty associated with the outcome of the election, interest rates across the maturity spectrum moved down after the voting. Long- and intermediate-term yields declined to their lowest levels in more than two years despite both exceptionally heavy new issue activity in the municipal bond market and continuation of the Treasury effort to lengthen the maturity of its outstanding debt. Short-term market rates of interest, too, dropped further and, at the end of November, reached their lowest levels since late 1972. The Federal Reserve discount rate was reduced late in November by ¼ percentage point. The change to 5¼ percent was the first lowering of this rate since January. The action was taken to bring the discount rate into better alignment with short-term rates generally.

The persistent decline in most long-term interest rates through the summer and fall (see Chart 1) may have come as something of a surprise. Earlier, considerable pessimism had been expressed about the outlook for long-term yields. The view that such rates would rise over the balance of the year apparently was premised on the strong first-quarter performance of the economy and the spring bulge in the monetary aggregates. With the prolonged sluggishness in economic growth over the second and third quarters, however, concern that capacity problems would soon lead to an acceleration in inflation diminished. Moreover, the relatively modest expansion in the monetary aggregates, particularly M_1, over the summer

Chart 1
Recent Changes in Interest Rates

Percent

- Aaa-rated seasoned corporate bonds
- 5-year Government securities
- Aaa-rated municipal bonds
- Discount rate FRBNY
- Federal funds

1976

Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, and Moody's Investors Service, Inc.
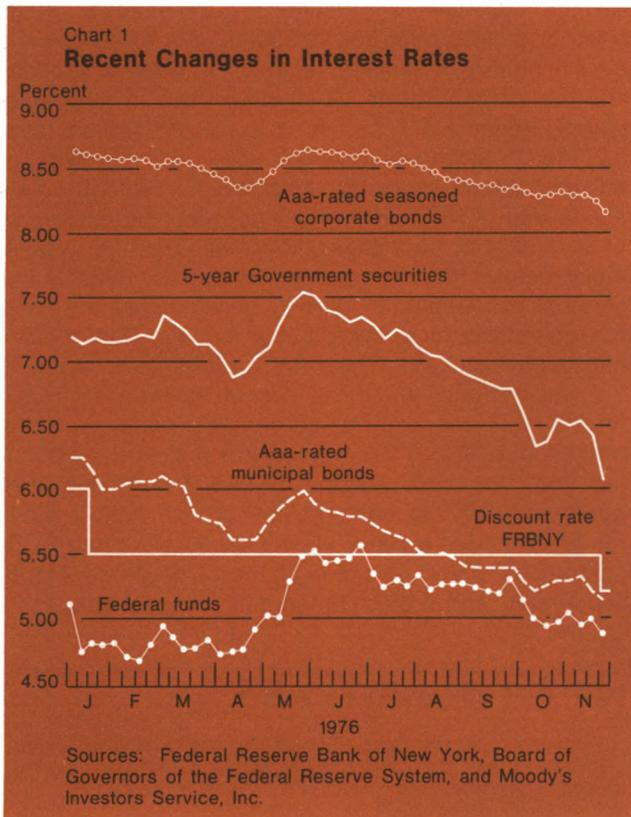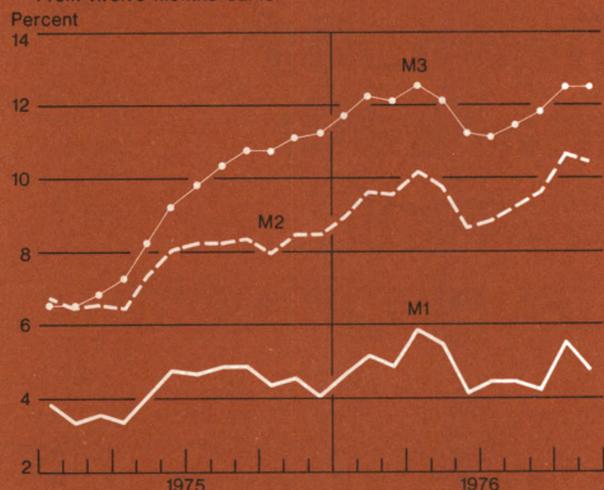
Chart 2
Growth in the Monetary Aggregates
From twelve months earlier

Source: Board of Governors of the Federal Reserve System.

helped to allay fears of another inflationary burst.

The prolonged drop in intermediate- and longer term yields came as the Treasury was in the process of lengthening the maturity of its marketable interest-bearing debt outstanding. Indeed, the average maturity of privately held debt, which stood at slightly over five years in mid-1967, fell consistently to a low of twenty-nine months at the end of 1975. It then held at about this level until the spring of this year, when it started to rise. By the end of November, the Treasury had succeeded in raising the average maturity to about three years. This increase was accomplished through heavy reliance on coupon offerings, especially intermediate-term issues, and a concomitant reduction in the use of Treasury bill auctions as a vehicle for raising new cash. In the first three refunding operations of the year, for example, the Treasury sold intermediate-term issues at par on a subscription basis. Demand for these issues proved in general to be far stronger than anticipated, with the Treasury ultimately selling considerably more of the securities than it had originally planned. Overall, through the first eleven months of this year, the Treasury raised $49 billion of new cash through coupon offerings but less than $6 billion in the bill market.

In recent months, the slower rate of economic expansion has continued. At the same time, evidence has accumulated suggesting that business loans at large weekly reporting commercial banks finally may have bottomed out. Over the thirteen-week period ended December 1, business loans at these banks, including loan sales to affiliates, rose $4.4 billion, whereas they had fallen by more than $21 billion from their peak at the end of 1974 to August of this year. While some of the latest increase reflects bank purchases of bankers' acceptances, there nevertheless has been some growth in business loans exclusive of acceptances. The pickup appears to be concentrated in major money center institutions, where such loans previously had been particularly weak. It should also be noted that, despite recent signs of some firming, overall business demand for short-term credit has still been unusually soft thus far in the economic recovery. And, with short-term market interest rates continuing to move lower, a few commercial banks reduced their prime lending rate ¼ percentage point to 6¼ percent in late November, following a ¼ percentage point reduction which became general early in the month.

The complete absence of a normal cyclical rise in short-term interest rates at this stage in the business cycle has preserved the competitiveness of time and savings deposits at commercial banks and thrift institutions at a point when such deposits might typically be feeling the effects of Regulation Q ceilings.[1] This factor, together with legal and institutional changes such as NOW accounts, corporate and local government savings accounts, and telephone transfers of funds from savings to checking accounts, has enhanced the attractiveness of savings relative to demand deposits and has contributed to divergent growth in the monetary aggregates over much of the year.[2] Indeed, over the first eleven months of the year, growth of M_2 generally was running about 4-5 percentage points above that of M_1, and the gap between the expansion of M_3 and of M_1 was even wider (see Chart 2). In testimony before the Congress in November, Federal Reserve Board Chairman Burns indicated that the long-run objectives for growth in the monetary aggregates had been modified to take these factors into account. The upper boundary of the desired growth-rate range for M_1 was reduced ½ percentage point, with the range set at 4½ to 6½ percent for the period extending from the third quarter of 1976 through the third quarter of 1977. In contrast, the growth path ceilings for the broader M_2 and M_3 measures were raised ½ percentage point, establishing new ranges of 7½ to 10 percent and 9 to 11½ percent, respectively.

[1] For an explanation of the recent behavior of short-term interest rates, see the article on pages 33-39 of this *Review*.

[2] For further discussion of these developments, see Laurence H. Meyer, "Alternative Definitions of the Money Stock and the Demand for Money", *Monthly Review* (Federal Reserve Bank of New York, October 1976), pages 266-74.

Interest rate behavior in the current economic recovery

by John P. Judd

Nominal interest rates, and especially short-term rates, are clearly behaving atypically when compared with previous postwar economic recoveries in the United States. The conventional wisdom is that yields can be expected to move in a roughly procyclical pattern in response to rising demands for money and credit during economic upturns and reductions in these demands in downturns. During the present recovery, however, rates have not exhibited the expected upward movement and, in fact, are now lower across the maturity spectrum than they were at the onset of the recovery in March 1975. This decline has generally been more pronounced in short-term than in long-term rates, following the usual pattern of greater cyclical fluctuation in yields at the short end of the term structure.

This article focuses on short-term yields and suggests several factors which may have contributed significantly to their decline over the first year and a half of the 1975-76 upswing. Emphasis is placed upon the highly probable reduction in inflationary expectations associated both with the lessening of the actual rate of inflation in the recovery and with the elimination of some highly visible supply side difficulties, such as the oil embargo and certain crop failures. There was, in addition, relatively little upward pressure on interest rates stemming from the corporate sector, as several factors apparently contributed to atypical cyclical changes in the demand for and supply of short-term credit by nonfinancial corporations. These included a pronounced increase in the demand for liquidity and an unusually slow pickup in business spending (particularly on inventories), coupled with a strong rise in corporate cash flow and equity market financing. Finally, there is the possibility that a shift in the public's demand for money

balances played a role in depressing short-term interest rates. In any event, the factors which produced the atypical cyclical decline in short-term rates helped the United States Treasury conduct extensive debt financing without encountering increases in short-term rates. Equally important, the Federal Reserve was able to follow a policy of growth in the monetary aggregates which was widely regarded as moderate within a framework of declining short-term yields.

This article is divided into five sections. The first section contrasts the current situation with past cyclical behavior of interest rates in the United States. This is followed by sections analyzing how the inflation premium, the restructuring of corporate balance sheets, and the possible shift in the demand for money affected recent short-term interest rate movements. Some comments on the relative importance of these factors are contained in the final section.

Recent movements in interest rates

Until the beginning of the 1970's, interest rates across the maturity spectrum in the United States generally exhibited lagging procyclical movements.[1] This pattern is reflected in the four- to six-month prime commercial paper rate in the recoveries beginning in 1954, 1958, and 1961 (see Chart 1). This representative short-term rate reached a trough several months after the trough in economic activity and then increased fairly steadily through at least the first eighteen months of recovery. By this point in these three upturns, the yield on commercial paper was 79 percent higher on average than it was at the respective troughs. This pattern was not followed, however, in the two most recent recoveries: by eighteen months after the No-

[1] See Cagan [2].

vember 1970 trough the commercial paper rate had fallen from 6.30 percent to 4.51 percent, a 29 percent decline, whereas in the current upturn this rate has fallen from 6.06 percent to 5.45 percent, a decline of 10 percent.

It is difficult to interpret interest rate movements during the 1970-72 recovery because of the announcement and implementation of Phases One and Two of the wage and price controls in the summer and fall of 1971. The commercial paper rate behaved in its usual fashion from the business-cycle trough in November 1970 until shortly after the enactment of Phase One in August 1971 (see Chart 1). It then declined sharply. This has been attributed to suddenly reduced inflationary expectations following the announcement of the wage-price freeze.[2] It seems appropriate, however, to exclude this episode from the analysis because the precise magnitude and timing

[2] See Cagan [2, page 50].

of the impact of Phase One and also Phase Two (with its Committee on Interest and Dividends) on price and interest rate expectations is uncertain.

Movements in most other short-term market rates and also in most medium- and long-term rates over the business cycles under discussion paralleled those of the commercial paper rate. The size of fluctuations, however, was generally smaller the longer the term of the security. For example, the average increase over the first eighteen months of the recoveries beginning in 1954, 1958, and 1961 was 157 percent for the yield on three-month Treasury bills and 79 percent for the four- to six-month prime commercial paper rate. At the long end of the term structure, yields on constant maturity long-term Government securities rose by only 17 percent on average and Moody's Aaa corporate bond rate increased by 12 percent. Similarly, interest rates during the 1975-76 recovery also have exhibited larger movements at the short end of the term structure (see Chart 2). By September 1976 the three-month

Chart 1
Short-term Interest Rates in the First Eighteen Months after Cyclical Troughs
Four- to six-month prime commercial paper rate
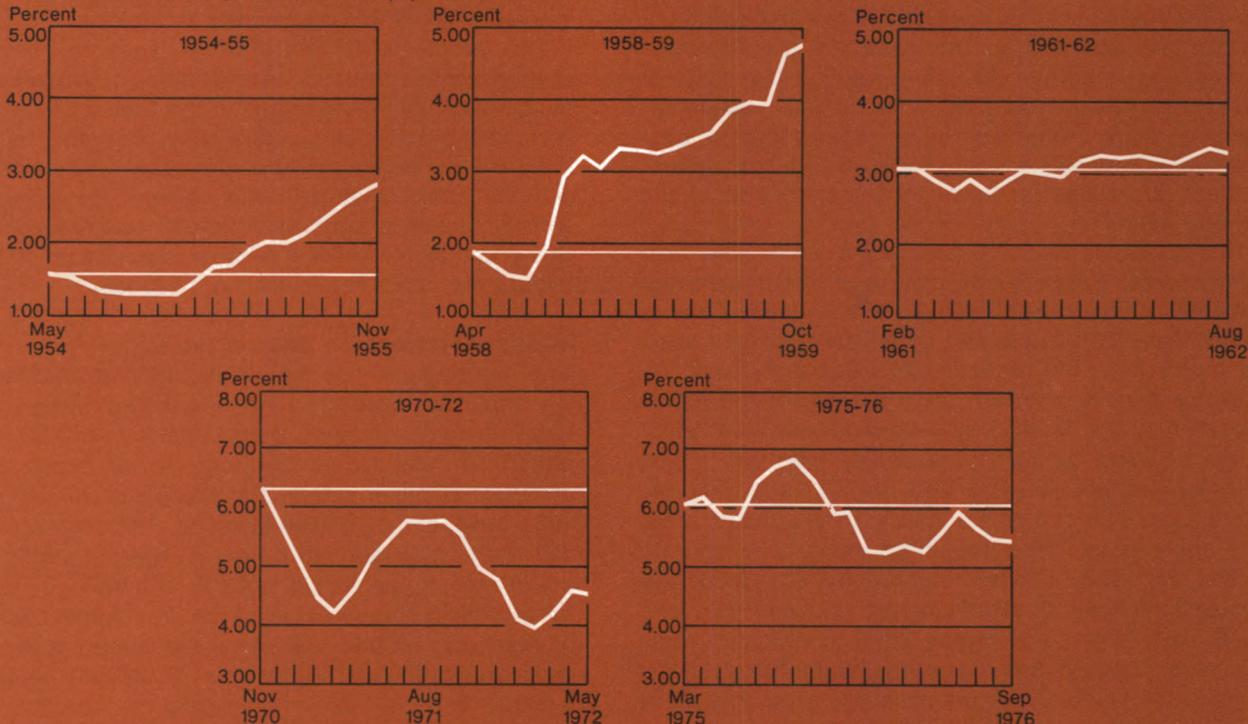
Note: Trough dates are those defined by the National Bureau of Economic Research except for the latest trough, which is tentatively judged to have ended in March 1975.

Source: Board of Governors of the Federal Reserve System.

Chart 2
**Yields on Representative Short-term
and Long-term Securities**

Percent

4-6 month
prime commercial
paper rate

Moody's Aaa
corporate bond rate

U. S. Government
20-year constant
maturity yield

3-month U. S. Treasury
bill rate

1973   1974   1975   1976

Note: Shaded area represents a period of economic
recession. The initial month is defined by the National
Bureau of Economic Research to be November 1973.
The final month is tentatively judged to be March 1975.
Sources: Board of Governors of the Federal Reserve
System and Moody's Investors Service, Inc.

Treasury bill rate and the commercial paper rate had
fallen to 93 percent and 90 percent of their March
1975 levels, respectively. Yields on both long-term
United States Government securities and seasoned
Aaa-rated corporate bonds, however, fell to only 97
percent of their trough levels. Hence, while interest
rates have generally fallen during this recovery, the
term structure of rates has behaved qualitatively the
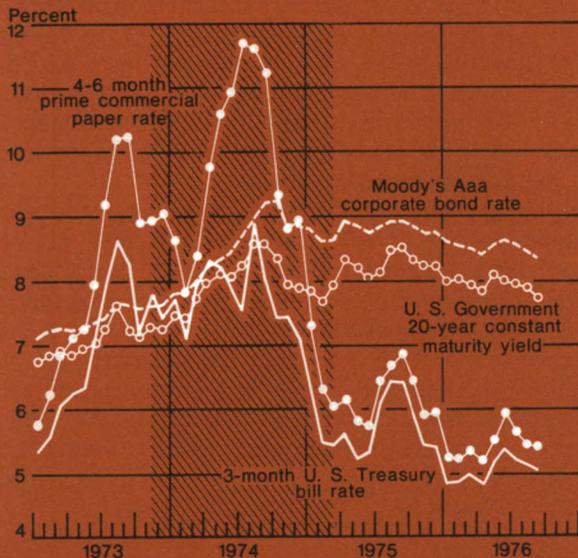same as in previous cycles; long rates moved in the
same direction but to a lesser extent than short rates.
In view of this, the remainder of this paper will focus
primarily on short-term yields.

The inflation premium
An important characteristic of short-term interest rates
during the first eighteen months of postwar upturns
is that, while they rose in the first three episodes and
fell in the latter two, rate levels were generally lower
in the earlier recoveries (see Chart 1). This situation
reflects the secular increase in interest rates over the
period usually attributed to the rapid runup in the rate
of inflation beginning in the mid-1960's (see Chart 3).
Higher rates of inflation may cause market participants

to expect higher future inflation, implying a decline in
the anticipated purchasing power of debt maturing
in the future. Under this so-called "Fisher" or "price
expectations" effect, lenders will demand and bor-
rowers will be willing to provide compensation in the
form of higher nominal interest rates. Within a highly
simplified setting, a fully anticipated 3 percentage point
increase in the rate of inflation requires that (all else
being equal) the nominal rate of interest rise by 3
percentage points to equate the demand and supply
of credit.[3]

In addition to being an important element in the
secular increase in nominal yields since the mid-1960's,
the rate of inflation can be expected to play a role
in the cyclical behavior of interest rates as well. For
this role to be substantial, there must be a fairly short
lag between changes in actual inflation rates and the
associated expectations and/or changes in actual
rates must be large. There is substantial evidence that
prior to the 1960's both short-run and long-run infla-
tionary expectations adapted to actual inflation in-
completely and with a long lag, but that since then
the adjustment has been fairly rapid and more com-
plete.[4] In addition, there is evidence that increasing
actual inflation rates were the dominant factor in
changes in the nominal Aaa bond yield from 1961 to
1971, whereas other factors were most important from
1954 to 1960.[5]

The increased role of inflation in the determination
of nominal interest rates since the mid-1960's can be
traced substantially to the widely different behavior
of inflation in the two periods (see Chart 3). First,
from 1953 through 1964 the average annual inflation
rate (as measured by the percentage change in the
consumer price index) was 1.3 percent, whereas in
the period from 1965 through September 1976 this
average jumped to 5.2 percent. In addition, the cyclical
swings in these rates have been larger in the latter
period, and the trend in inflation has been upward,
unlike the earlier period. All in all, it would appear
that the cost of not closely considering future infla-
tion in economic decisions has risen significantly since
1964, providing a greater incentive for economic
agents to observe carefully and react quickly to price

[3] This one-to-one relationship between changes in anticipated
inflation and nominal interest rates cannot, in fact, be expected
to hold precisely. For example, progressive income taxation (all else
being equal) implies that nominal rates will rise by more than the
increase in anticipated inflation. For a theoretical and empirical
discussion of the inflation premium and nominal interest rates,
see LeRoy [6].

[4] Cagan [2], Turnovsky [7], and Yohe and Karnosky [8] are
among those whose research supports this position.

[5] See Feldstein and Chamberlain [4].

changes. Moreover, even if reaction time has not increased materially since the mid-1960's, the greater size of cyclical price swings would have by itself increased the role of actual inflation rates in nominal interest rate movements.

While inflation may in general have become a more important determinant of interest rates in recent years, there is another reason, which is peculiar to the 1975-76 episode, for the rapid incorporation of decreases in the rate of inflation into expectations. It is widely held that the large price increases in 1973-74 were greatly affected by certain special factors not related to aggregate demand, such as the oil embargo and various crop failures. It was, therefore, reasonable for many participants to expect a diminution of inflation when these supply difficulties were resolved. Hence, the recently observed decline in the rate of inflation most likely confirmed these expectations and was translated quickly into a decline in nominal short-term interest rates. Since these expectations related to phenom-

ena widely regarded as temporary, short-term rates should have been affected to a greater extent than long-term yields. The data are consistent with this explanation, since three-month Treasury bill rates declined from 8.96 percent at their August 1974 peak to 5.08 percent in September 1976, while long-term Government bond yields dropped from 8.60 percent to only 7.78 percent over the same period. It should be noted, however, that this movement in relative yields is also consistent with the typical cyclical pattern described previously.

It is, of course, difficult to determine the exact quantitative relationship between the rate of inflation and a nominal rate of interest. The following rather crude calculation may be useful, however, in putting recent experience in perspective. If the commercial paper rate had increased during the first eighteen months of the 1975-76 recovery by the same percentage that occurred on average in the upturns beginning in 1954, 1958, and 1961, it would have attained a level of about 11 percent in September

Chart 3
Rates of Inflation in the Postwar Period
Percentage change in the consumer price index from one year earlier

Source: United States Department of Labor, Bureau of Labor Statistics.

1976. The level reached was in fact 5.45 percent, leaving a difference of about 5½ percentage points. The rate of inflation, as measured by the percentage changes in the consumer and wholesale price indexes, declined over the same period by 4.8 percentage points and 8.7 percentage points, respectively. Hence, a large part of the atypical behavior of short-term interest rates probably can be attributed to the diminution of the inflation premium.[6]

Corporate balance sheets
Another important element in the cyclical pattern of interest rates is the behavior of the demand for credit by nonfinancial corporations. The typical pattern of increased credit demands in the early stages of recoveries is related to increases in business spending during these periods. These increases have been, however, unusually small in the current upturn. During the first five quarters of the recoveries beginning in 1954, 1958, and 1961, the book value of inventories increased by roughly 3½ to 5 percent, while the percentage increase over a comparable period in the current upturn was only a little over 1 percent. This modest advance was probably related to the unusually high ratio of inventories to sales attained in the 1974 downturn and to the conservative approach to inventory spending taken by business in the wake of that experience.[7] Moreover, during the first five quarters of the three previous upturns considered here, nominal business fixed investment rose by roughly 12.5 to 18 percent, but it was up only by 7 percent in the current episode. This situation may have been caused, in part, by the somewhat lower levels of capacity utilization reached in the 1974 recession than those in previous downturns. In light of these developments, it would seem that part of the reason that the credit market activities of the Treasury did not induce increases in interest rates is that business sector demand for credit has been unusually weak.

Even if business spending had increased in proportions similar to previous upturns, several aspects of the financial activities of nonfinancial corporations would have, by themselves, contributed to declines in short-term interest rates. These factors can be divided into three categories: corporate cash flow, equity market financing, and the demand for liquidity.[8] As the partial result of inflation and the tax cuts of 1975, increases in nonfinancial corporate cash flow less inventory profits in the current recovery have been larger than in any of the three previous recoveries being considered. During the first five quarters of recovery, this measure increased by 26 percent in 1954-55, 24½ percent in 1958-59, and 24 percent in 1961-62, but by 45 percent in 1975-76. This recent increase is especially telling when compared with the rather modest growth in capital expenditures (nominal business fixed investment plus changes in the book value of inventories) over the same period. In addition, equity market financing by corporations was substantially larger in the current recovery as compared with previous ones. Over the first four quarters of recovery, net funds raised through stock sales equaled about $1.0 billion in 1954-55, $2.1 billion in 1958-59, and $1.5 billion in 1961-62 but equaled $9.8 billion in 1975-76. These factors have contributed to unusual weakness in growth of the demand for credit, and especially short-term credit, in the current recovery.

Another financial factor which has been important in reducing short-term nominal yields is the improvement in corporate liquidity since late 1974. Through the 1960's and the early 1970's, there was a secular deterioration in the liquidity position of nonfinancial corporations as measured by certain standard ratios. This phenomenon may have been related to the almost uninterrupted business-cycle upswing during that period. The vulnerability of corporations to sudden changes in credit market conditions was not really demonstrated until the events of the most recent downturn in 1973-75. Toward the end of that recession, nonfinancial corporations suddenly altered their previous behavior in favor of increased liquidity. This situation is evident in movements in the ratio of liquid assets to current liabilities and in the ratio of short-term debt to bonds (see Chart 4). The former ratio declined steadily from a peak in 1959-III of 55 percent to a low of 29 percent in 1974-IV but has increased markedly since then. The latter ratio reached a trough in 1958-III of 36 percent, then increased to 67 percent in 1974-IV, but subsequently has fallen substantially. Hence, the pattern since late 1974 has been one of lengthening the maturity structure of debt and placing greater emphasis on liquid assets.[9] Both of these factors have served to put downward pressure on short-term interest rates.

[6] It should be noted that the important role of the inflation premium in nominal interest rate movements raises a question as to whether rates will exhibit a typical cyclical pattern of any kind in the future. This will, of course, depend heavily upon whether or not inflation rates resume the roughly procyclical pattern which has been less pronounced during the 1970's than in the prior postwar period.

[7] Inventory investment may also have been sluggish in part because the anticipated rate of inflation declined, making the holding of physical assets less advantageous.

[8] These points are discussed in detail by Harris [5] (also see [1] in connection with the demand for business loans but apply equally well to recent short-term interest rate movements.

[9] The additional liquid assets have been mainly in the form of United States Treasury bills.

Chart 4
Selected Liquidity Measures for Nonfinancial Corporations
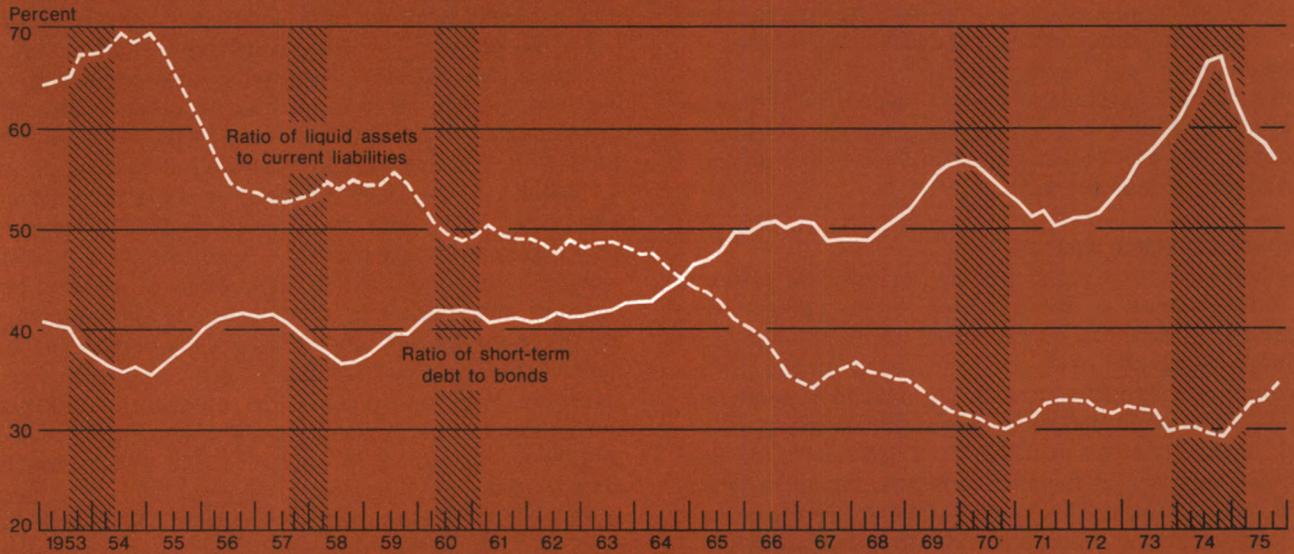
Note: Shaded areas represent periods of recession as defined by the National Bureau of Economic Research except for the latest recession, which is tentatively judged to have ended in March 1975.
Source: Board of Governors of the Federal Reserve System.

The demand for money

The preceding discussion has attempted to explain the unusual decline of short-term interest rates in the current recovery by analyzing the behavior of variables which normally would be expected to explain fluctuations in nominal interest rates. It may be, however, that recently observed interest rate behavior stems in part from a shift in the public's demand for money relative to that for other assets. This possibility has been raised by recent difficulties with econometrically estimated money demand equations. Some equations for M_1 have overestimated the demand for money to a progressively greater extent since the middle of 1974.[10]

These results at least raise the possibility of a yet unexplained and undefined change in the relationship between the demand for money and its explanatory variables. Such a change would be important for interest rate movements in the current upturn. If money demand has shifted inward, this would most likely imply simultaneous outward shifts in the supply of short-term credit. If the public demands less money at any given interest rate level than formerly was the case, it will presumably want to hold greater quantities of other liquid assets such as Treasury

[10] A recent paper by Enzler, Johnson, and Paulus [3] discusses these difficulties and the authors' numerous attempts to correct for them, none of which were particularly successful.

bills, commercial paper, and deposits at nonbank thrift institutions. As demand shifts in favor of these other assets, short-term interest rates tend to fall.

Conclusion

This article has traced the unexpected behavior of short-term interest rates in the current economic recovery principally to changes in the inflation premium and to other factors affecting demand and supply in the market for short-term credit. Because it is difficult to evaluate the precise size of these effects and indeed even their relative importance, conclusions necessarily must be tentative. Nevertheless, even if allowance is made for fairly long lags in the response of inflationary expectations to actual inflation rates, a decline in the inflation premium since early 1975 would seem capable of explaining much of the recent decline in rates. This factor alone, however, should leave borrowers and lenders in about the same position as prior to the change in inflationary expectations, and should not affect the quantity of short-term credit. Since nonfinancial commercial paper plus business loans outstanding at all commercial banks declined at an average annual rate of 3.7 percent from March 1975 through September 1976, it seems likely that factors other than the inflation premium have had an effect. Among those proposed above, some have contributed to an increase in the supply of credit and

others have produced a decrease in the demand for it. Both effects result in lower interest rates, but only the demand elements cause the quantity of short-term credit to fall as well. This suggests that the factors reducing credit demand—weak growth in business spending relative to available internal funds, emphasis on equity market financing, and the lengthening of the maturity of the debt of nonfinancial corporations—have played a somewhat greater role than the factors increasing the supply of credit—greater demand for liquid assets by nonfinancial corporations and a possible contraction in the demand for money balances.

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Treasury and Federal Reserve Foreign Exchange Operations

by Alan R. Holmes and Scott E. Pardee*

During the August-October period under review, foreign exchange market activity reflected the large disparities that persisted in actual and expected price performance and in balance-of-payments positions of major European countries. Market participants were quick to react to new events and to rumors or official statements which reinforced their expectations of a rise or a fall in a particular currency. In this atmosphere, markets for several currencies were unsettled by large-scale shifts in professional trading positions as well as in commercial leads and lags.

Among those European currencies floating independently vis-à-vis the dollar, the pound was driven down 11 percent during the period, the Italian lira declined a net of 3 percent and the French franc slipped a net of 2 percent. Meanwhile, within the group of currencies joined together in the European Community (EC) "snake", speculative pressures had reemerged late in July on expectations of an early upward adjustment for the German mark against the other participating currencies. Tensions within this arrangement continued to build through the October 3 election in Germany, and member central banks again intervened massively while taking a variety of other measures—including in some cases a sharp tightening of monetary policy—to maintain their currencies within the limits of the snake. After an October 17 meeting in Frankfurt, the participating governments announced an agreement by which

* Mr. Holmes is the Executive Vice President in charge of the Foreign Function of the Federal Reserve Bank of New York and Manager, System Open Market Account. Mr. Pardee is Vice President in the Foreign Function and Deputy Manager for Foreign Operations of the System Open Market Account. The Bank acts as agent for both the Treasury and the Federal Reserve System in the conduct of foreign exchange operations.

the mark's parity was adjusted upward by 2 to 6 percent against its partner currencies. After some initial hesitancy in the market, a substantial unwinding of dealers' positions and reversal of commercial leads and lags was in progress by the month end.

As in previous episodes of market stress, the dollar, as the main vehicle currency in the market, was inevitably caught up in the cross fire, rising against some currencies and falling against others. Against the German mark, however, the dollar began to lose some of its earlier resiliency to the heavy shifts into marks which developed each time market participants sought to switch out of other EC snake currencies or out of currencies, like sterling, which were weakening generally. This reduced buoyancy for the dollar in part reflected market concern over the pause in the

Table 1

Federal Reserve System Drawings and Repayments under Reciprocal Currency Arrangements

In millions of dollars equivalent

Transactions with	System swap commitments, July 31, 1976	Drawings (+) or repayments (—) August 1 through October 31, 1976	System swap commitments, October 31, 1976
National Bank of Belgium	82.4	— 55.0	27.4
Swiss National Bank ...	1,147.2	—1,147.2	-0-
Total	1,229.6	—1,202.2	27.4

Federal Reserve System Drawings and Repayments under Special Swap Arrangement with the Swiss National Bank

In millions of dollars equivalent

Transactions with	System swap commitments, July 31, 1976	Drawings (+) or repayments (−) August 1 through October 31, 1976	System swap commitments, October 31, 1976
Swiss National Bank . . .	-0-	+1,147.2	1,147.2
Total	-0-	+1,147.2	1,147.2

United States economic recovery, the relative decline in interest rates here, and the further widening of our trade deficit. Uncertainties surrounding the United States elections also tended to weigh on market sentiment toward the dollar. In this atmosphere the dollar declined by a net 6 to 7 percent against the mark and other European currencies linked to it.

For the most part, this decline was orderly. The occasionally sharp drops in dollar rates were mainly confined to the European trading day, at which times the German Bundesbank supplemented its intervention in other snake currencies with small to moderate purchases of dollars. On a few days, however, the bidding for marks spilled into the New York market and unsettled trading conditions here. On August 16-17, when speculation over possible rate adjustments within the EC snake triggered more generalized bidding for marks, the Federal Reserve intervened in New York, selling $15.9 million equivalent of marks from balances. Again, in September and early October, amidst uncertainties surrounding the general election in Germany, the Federal Reserve operated on four days (September 16 and 24, October·5 and 6) to sell a total of $37.2 million of marks. Toward the end of October, when the continued volatility in sterling kept the markets generally unsettled, the dollar was again adversely affected at times and the Federal Reserve sold another $16.3 million of marks in operations on October 19 and 26, also from balances.

In summary, the Federal Reserve sold a total of $69.4 million equivalent of marks from existing balances during the three-month period. These sales were largely offset, however, by purchases of $63.4 million equivalent of marks, principally from correspondents.

In other operations, as part of its program to repay

swap debt outstanding since August 1971, the Federal Reserve acquired sufficient Belgian francs in the market and from correspondents to cover the remaining $82.4 million of its swap drawings on the National Bank of Belgium. Of this, the System had repaid $55 million by the end of October and had purchased in the forward market francs sufficient for repayment of the remainder in early November.

Moreover, in October, the Federal Reserve and United States Treasury reached agreement with the Swiss National Bank on an orderly procedure for repaying over three years the Swiss franc indebtedness remaining from August 1971. This included $1,147.2 million equivalent of drawings under the Federal Reserve swap line, as well as the $1,599.3 million equivalent of United States Treasury Swiss franc-denominated notes. In this connection, the Federal Reserve's drawings on the original swap arrangement with the National Bank were repaid on October 29, using Swiss francs drawn under a newly established special swap facility which, in turn, will be reduced as the swap is repaid over the three-year period.

In September, the Bank of England drew a further $100 million each from the Federal Reserve and the United States Treasury, raising total drawings in both cases to $300 million under the standby facility established in June 1976. These drawings were in proportion to drawings on other countries participating in the $5.3 billion package that terminates on December 9. In connection with the repayment of drawings under this agreement, the United Kingdom authorities initiated in October an application for a $3.9 billion drawing on the International Monetary Fund (IMF).

On August 31, following persistent pressures on the Mexican peso through much of the year, the Mexican authorities announced that they would no longer sup-

Drawings and Repayments by Foreign Central Banks and the Bank for International Settlements under Reciprocal Currency Arrangements

In millions of dollars

Banks drawing on Federal Reserve System	Drawings on Federal Reserve System outstanding July 31, 1976	Drawings (+) or repayments (−) August 1 through October 31, 1976	Drawings on Federal Reserve System outstanding October 31, 1976
Bank of England . . .	200.0	+100.0	300.0
Bank of Mexico	360.0	−360.0	-0-
Total	560.0	{ +100.0 −360.0	300.0

port the previous fixed rate of $0.08, and over subsequent days the peso depreciated by almost 39 percent. After some recovery, official intervention was resumed to help steady the rate around $0.0505. By that time, Mexico had applied for substantial medium-term assistance from the IMF. In that connection, on September 20, the United States Treasury and the Federal Reserve agreed to a special arrangement with the Bank of Mexico, making available up to $600 million of interim financing to Mexico. On this basis, the Bank of Mexico drew $365 million on the United States Treasury in early October and repaid that amount out of proceeds of its first IMF drawing in early November. The Bank of Mexico also repaid in early October the $360 million of swap drawings on the Federal Reserve outstanding for six months. In the market, however, selling pressure against the peso remained heavy, and in late October the authorities permitted the peso rate to depreciate by a further 25 percent.

Swap network operations, 1962-76
As a supplement to this interim report, tables are presented providing historical data on Federal Reserve swap operations over the entire 1962-76 period in which the reciprocal currency arrangements have been in existence. These summaries have been prepared in response to a number of requests from both the academic and financial communities for data on System operations. Table I shows the changes in the amounts available under each of the reciprocal currency arrangements. Table II presents Federal Reserve drawings and repayments by quarter on those swap lines for which there were operations, and Table III gives drawings and repayments by others.

Table I

Federal Reserve Reciprocal Currency Arrangements
In millions of dollars; yearly increases (+) and decreases (−)

Institution	Original facility Date	Amount	Amount of facility 12/31/62	1963	1964	1965	1966	1967	1968
Austrian National Bank	10/25/62	50.0	50.0	—	—	—	+ 50.0	—	—
National Bank of Belgium	6/20/62	50.0	50.0	—	+ 50.0	—	+ 50.0	+ 75.0	—
Bank of Canada	6/26/62	250.0	250.0	—	—	—	+ 250.0	+ 250.0	+ 250.0
Bank of Denmark	5/17/67	100.0	-0-					100.0†	—
Bank of England	5/31/62	50.0	50.0	+ 450.0	+250.0	—	+ 600.0	+ 150.0	+ 500.0
Bank of France	3/ 1/62	50.0	50.0	+ 50.0	—	—	—	—	+ 900.0
German Federal Bank	8/ 2/62	50.0	50.0	+ 200.0	—	—	+ 150.0	+ 350.0	+ 250.0
Bank of Italy	10/18/62	50.0	150.0*	+ 100.0	—	+200.0	+ 150.0	+ 150.0	+ 250.0
Bank of Japan	10/29/63	150.0	-0-	150.0†	—	+100.0	+ 200.0	+ 300.0	+ 250.0
Bank of Mexico	5/17/67	130.0	-0-					130.0†	—
Netherlands Bank	6/13/62	50.0	50.0	+ 50.0	—	—	+ 50.0	+ 75.0	+ 175.0
Bank of Norway	5/17/67	100.0	-0-					100.0†	—
Bank of Sweden	1/17/63	50.0	-0-	50.0†	—	—	+ 50.0	+ 100.0	+ 50.0
Swiss National Bank	7/16/62	100.0	100.0	+ 50.0	—	—	+ 50.0	+ 200.0	+ 200.0
Bank for International Settlements:									
Swiss francs-dollars	7/16/62	100.0	100.0	+ 50.0	—	—	+ 50.0	+ 200.0	+ 200.0
Other authorized European currencies-dollars	8/ 2/65	150.0	-0-			150.0†	+ 50.0	+ 400.0	+ 400.0
Total			900.0	+1,150.0	+300.0	+450.0	+1,700.0	+2,580.0	+3,425.0

* Facility increased $100.0 million on December 8, 1962.
† New facility.

Table I (continued)

Institution	1969	1970	1971	1972	1973	1974	1975	1/1/76 to 10/31/76	Amount of facility 10/31/76
Austrian National Bank	+100.0	—	—	—	+ 50.0	—	—	—	250.0
National Bank of Belgium	+275.0	—	+100.0	—	+ 400.0	—	—	—	1,000.0
Bank of Canada	—	—	—	—	+1,000.0	—	—	—	2,000.0
Bank of Denmark	+100.0	—	—	—	+ 50.0	—	—	—	250.0
Bank of England	—	—	—	—	—	+1,000.0	—	—	3,000.0
Bank of France	—	—	—	—	+1,000.0	—	—	—	2,000.0
German Federal Bank	—	—	—	—	+1,000.0	—	—	—	2,000.0
Bank of Italy	—	+250.0	—	—	+ 750.0	+1,000.0	—	—	3,000.0
Bank of Japan	—	—	—	—	+1,000.0	—	—	—	2,000.0
Bank of Mexico	—	—	—	—	+ 50.0	—	+180.0	—	360.0
Netherlands Bank	−100.0	—	—	—	+ 200.0	—	—	—	500.0
Bank of Norway	+100.0	—	—	—	+ 50.0	—	—	—	250.0
Bank of Sweden	—	—	—	—	+ 50.0	—	—	—	300.0
Swiss National Bank	—	—	+400.0	—	+ 400.0	—	—	—	1,400.0
Bank for International Settlements:									
Swiss francs-dollars	—	—	—	—	—	—	—	—	600.0
Other authorized European currencies-dollars	—	—	—	—	+ 250.0	—	—	—	1,250.0
Total	{ +575.0 / −100.0 }	+250.0	+500.0	-0-	+6,250.0	+2,000.0	+180.0	-0-	20,160.0

Table II
Federal Reserve System Drawings and Repayments under Reciprocal Currency Arrangements
March 1962 through October 1976; in millions of dollars equivalent; drawings (+) or repayments (−)

Period	Austrian National Bank	National Bank of Belgium	Bank of Canada	Bank of England	Bank of France	German Federal Bank	Bank of Italy	Netherlands Bank	Swiss National Bank	BIS against Swiss francs	BIS against Belgian francs
1962: I					+ 50.0						
II				+50.0				+ 10.0			
III		+ 10.5 / − 10.5		−50.0	− 50.0			+ 40.0 / − 50.0	+ 50.0	+ 60.0 / − 10.0	
IV	+50.0	+ 20.0 / − 5.0					+ 50.0	+ 10.0		+ 20.0 / − 15.0	
Outstanding	50.0	15.0	-0-	-0-	-0-	-0-	50.0	10.0	50.0	55.0	-0-
1963: I	−50.0	+ 5.0 / − 20.0		+ 25.0 / − 25.0			− 50.0	− 10.0		− 9.5	
II		+ 5.0 / − 5.0				+150.0		+ 50.0	− 50.0	− 45.5	
III					+12.5	−113.0		+ 40.0 / − 50.0		+ 50.0	
IV		+ 15.0	+20.0 / −20.0	+ 10.0 / − 10.0	+ 9.0 / −12.5	+136.0 / −113.0		+ 60.0 / − 20.0	+ 80.0 / − 5.0	+100.0 / − 5.0	
Outstanding	-0-	15.0	-0-	-0-	9.0	60.0	-0-	80.0	75.0	145.0	-0-
1964: I		− 15.0			− 9.0	+ 55.0 / −115.0		− 55.0		− 15.0	
II								− 25.0	+ 25.0 / −100.0	−130.0	
III		+ 37.5						+ 95.0			
IV		+107.5 / −100.0				+ 50.0		+ 5.0		+100.0	
Outstanding	-0-	45.0	-0-	-0-	-0-	50.0	-0-	100.0	-0-	100.0	-0-
1965: I		+ 55.0 / − 10.0				+ 15.0 / − 60.0	+100.0	− 50.0	+150.0 / − 20.0		
II		+ 10.0 / − 40.0				− 5.0	+150.0 / − 82.0	− 50.0	− 70.0	− 60.0	
III		+ 75.0 / − 80.0					+100.0 / −168.0	+ 25.0	− 12.0	− 40.0	
IV		+ 10.0 / − 30.0						− 25.0	− 48.0		
Outstanding	-0-	35.0	-0-	-0-	-0-	-0-	100.0	-0-	-0-	-0-	-0-
1966: I		− 35.0					−100.0				
II											
III		+ 30.0 / − 30.0					+325.0 / −225.0	+ 65.0 / − 10.0	+ 75.0 / − 5.0	+ 75.0	
IV						+140.0	− 85.0	− 20.0	− 55.0		
Outstanding	-0-	-0-	-0-	-0-	-0-	140.0	15.0	35.0	15.0	75.0	-0-
1967: I						−140.0	− 15.0	− 35.0	− 15.0	− 75.0	
II		+ 37.5 / − 10.0							+185.0 / − 28.0	+185.0	
III		+ 97.5 / − 10.0					+100.0	+ 40.0	+ 33.0 / − 42.0	+ 15.0	
IV		+ 76.2 / − 85.4				+350.0	+400.0	+130.0	+127.0 / − 25.0	+285.0 / − 85.0	
Outstanding	-0-	105.8	-0-	-0-	-0-	350.0	500.0	170.0	250.0	400.0	-0-
1968: I		+ 53.1 / − 88.8				+300.0 / −350.0	−175.0	+ 15.0 / −120.0	− 173.0	−345.0	
II		+ 54.0 / −124.1				−300.0	+175.0 / −311.0	− 65.0	+ 73.0 / − 15.0	− 55.0	
III							−189.0		+145.0 / −160.0		
IV						+112.1			+280.0 / − 80.0		
Outstanding	-0-	-0-	-0-	-0-	-0-	112.1	-0-	-0-	320.0	-0-	-0-
1969: I						−112.1		+ 40.0	− 280.0		
II								− 40.0	+100.0 / − 45.0		
III									− 95.0		
IV		+ 55.0						+300.0 / −170.0	+200.0 / − 55.0		
Outstanding	-0-	55.0	-0-	-0-	-0-	-0-	-0-	130.0	145.0	-0-	-0-

Table II *(continued)*

Period	Austrian National Bank	National Bank of Belgium	Bank of Canada	Bank of England	Bank of France	German Federal Bank	Bank of Italy	Netherlands Bank	Swiss National Bank	BIS against Swiss francs	BIS against Belgian francs
1970: I		+ 50.0							− 145.0		
II		{+ 45.0, −130.0}						−130.0	+ 200.0		
III		+135.0						+270.0	− 200.0		
IV		{+165.0, −110.0}						+ 30.0	+ 300.0		
Outstanding	-0-	210.0	-0-	-0-	-0-	-0-	-0-	300.0	300.0	-0-	-0-
1971: I		{+335.0, −125.0}						{+130.0, −300.0}	{+ 150.0, − 450.0}		
II		{+125.0, −205.0}				+ 60.0		{+120.0, −250.0}	+ 250.0		
III		+260.0		+750.0					+ 750.0	+600.0	+35.0
IV		−145.0		− 35.0	− 10.0						
Outstanding	-0-	455.0	-0-	715.0	-0-	50.0	-0-	-0-	1,000.0	600.0	35.0
1972: I											
II		− 20.0		− 52.0					− 300.0		
III		{+ 10.2, − 10.2}		−663.0		− 50.0					
IV		{+ 35.0, − 55.0}							− 130.0		−35.0
Outstanding	-0-	415.0	-0-	-0-	-0-	.-0-	-0-	-0-	570.0	600.0	-0-
1973: I		− 25.0				{+104.6, −104.6}			− 5.0		
II											
III		{+ 6.0, − 52.0}			{+47.0, −47.0}	{+435.6, −278.9}					
IV		− 82.2				{+ 21.0, −177.7}		{+ 2.9, − 2.9}			
Outstanding	-0-	261.8	-0-	-0-	-0-	-0-	-0-	-0-	565.0	600.0	-0-
1974: I						{+255.0, − 3.7}			− 193.8		
II						{+130.4, −122.8}					
III		{+ 1.7, − 1.7}				−258.8		{+ 7.6, − 7.6}			
IV		{+ 13.2, − 13.2}				{+301.5, − 82.8}		{+ 38.0, − 34.8}	{+ 13.3, − 5.9}		
Outstanding	-0-	261.8	-0-	-0-	-0-	218.7	-0-	3.2	378.5	600.0	-0-
1975: I		+ 16.7				{+644.1, − 25.0}		+ 49.0	+ 152.1		
II		{+ 13.1, − 29.8}			{+45.6, − 5.1}	{+ 63.4, −487.7}		{+ 47.3, − 90.6}	− 159.4		
III					−40.5	−413.5		− 8.8			
IV		{+ 54.0*, − 18.1}							+ 196.0†		
Outstanding	-0-	297.6	-0-	-0-	-0-	-0-	-0-	-0-	567.2	600.0	-0-
1976: I		− 86.5				{+133.9, − 26.4}		{+ 19.6, − 19.6}	{+ 600.0‡, − 20.0}	−600.0‡	
II		− 83.7				−107.5					
III		−100.0									
October									−1,147.2§		
Outstanding	-0-	27.4	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-

* Amount by which the dollar countervalue of the Federal Reserve's pre-August 1971 Belgian franc commitments, adjusted for the Belgian franc revaluation of 1971, was increased to reflect the two United States dollar devaluations of 1971 and 1973.

† Amount by which the dollar countervalue of the Federal Reserve's pre-August 1971 Swiss franc commitments was increased to take account of the two United States dollar devaluations of 1971 and 1973. This increase is reflected entirely in the System's position with the Swiss National Bank because of a transfer of Swiss franc commitments from the Bank for International Settlements to the Swiss National Bank sufficient to keep Federal Reserve commitments to the BIS within the $600 million swap facility.

‡ Consolidation of Swiss franc swap debt.

§ The Federal Reserve repaid the outstanding $1,147.2 million equivalent of its pre-August 1971 Swiss franc swap indebtedness and took down the same amount on the newly created special swap line designed to refund the short-term obligation into a medium-term obligation, which will be reduced as drawings are repaid over the next three years.

Table III
Drawings and Repayments by Foreign Central Banks and the Bank for International Settlements (BIS) under Reciprocal Currency Arrangements

March 1962 through October 1976; in millions of dollars; drawings (+) or repayments (−)

Period	Austrian National Bank	National Bank of Belgium	Bank of Canada	National Bank of Denmark	Bank of England	Bank of France	Bank of Italy	Bank of Japan	Bank of Mexico	Netherlands Bank	BIS against German marks
1962: I											
II			+250.0								
III											
IV			−250.0								
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1963: I		{ + 25.0 / − 12.5 }			+ 25.0						
II		{ + 10.0 / − 12.5 }									
III		{ + 10.0 / − 5.0 }			− 25.0						
IV		− 15.0					+ 50.0				
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	50.0	-0-	-0-	-0-	-0-
1964: I							+100.0				
II					+ 15.0		−150.0	+50.0			
III					{ + 85.0 / − 65.0 }			{ +30.0 / −30.0 }			
IV					{ +1,270.0 / −1,105.0 }			−50.0			
Outstanding	-0-	-0-	-0-	-0-	200.0	-0-	-0-	-0-	-0-	-0-	-0-
1965: I					{ + 605.0 / − 485.0 }						
II					{ + 610.0 / − 570.0 }						
III					{ + 475.0 / − 85.0 }						
IV					{ + 75.0 / − 350.0 }						
Outstanding	-0-	-0-	-0-	-0-	475.0	-0-	-0-	-0-	-0-	-0-	-0-
1966: I					− 475.0						
II					+ 175.0						
III			+ 17.6		{ + 450.0 / − 225.0 }						{ + 75.0 / − 75.0 }
IV			− 17.6		− 50.0						{ +210.0 / − 10.0 }
Outstanding	-0-	-0-	-0-	-0-	350.0	-0-	-0-	-0-	-0-	-0-	200.0
1967: I					− 350.0						{ + 43.0 / −243.0 }
II					+ 225.0						{ +182.0 / − 39.0 }
III					+ 425.0						{ +191.0 / −334.0 }
IV					{ +1,000.0 / − 600.0 }						{ +421.0 / − 75.0 }
Outstanding	-0-	-0-	-0-	-0-	1,050.0	-0-	-0-	-0-	-0-	-0-	346.0
1968: I			+250.0		+ 50.0						{ + 66.0 / −412.0 }
II			−125.0	+ 25.0	{ + 545.0 / −1,645.0 }	+100.0				+ 54.7	{ +306.0 / −195.0 }
III		{ + 30.0 / − 20.0 }	−125.0	− 25.0	{ + 600.0 / − 200.0 }	{ +390.0 / − 40.0 }				− 24.9	{ +145.0 / −256.0 }
IV		{ +180.5 / −183.0 }			{ + 850.0 / − 100.0 }	{ +275.0 / −295.0 }				− 29.8	{ +126.0 / − 46.0 }
Outstanding	-0-	7.5	-0-	-0-	1,150.0	430.0	-0-	-0-	-0-	-0-	80.0
1969: I		{ + 74.0 / − 58.5 }		{ + 25.0 / − 25.0 }	− 50.0	{ +225.0 / −194.0 }					{ + 51.0 / −131.0 }
II	+50.0	{ +195.0 / −104.0 }		{ +100.0 / −100.0 }	{ + 465.0 / − 540.0 }	−461.0				+ 82.2	{ + 25.0 / − 25.0 }
III	−50.0	{ +244.0 / −154.0 }			{ + 330.0 / − 255.0 }	{ + 65.0 / − 65.0 }	+300.0			{ +109.7 / − 82.2 }	{ + 4.0 / − 4.0 }
IV		−204.0			− 450.0		−300.0			−109.7	{ + 62.0 / − 62.0 }
Outstanding	-0-	-0-	-0-	-0-	650.0	-0-	-0-	-0-	-0-	-0-	-0-

Table III *(continued)*

Period	Austrian National Bank	National Bank of Belgium	Bank of Canada	National Bank of Denmark	Bank of England	Bank of France	Bank of Italy	Bank of Japan	Bank of Mexico	Netherlands Bank	BIS against German marks
1970: I					− 650.0	+100.0 −100.0	+800.0				{ + 136.0 − 136.0
II							+200.0 −600.0				{ + 77.0 − 77.0
III					+ 400.0		−400.0				{ + 77.0 − 77.0
IV					− 400.0						{ + 44.0 − 44.0
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1971: I											{ + 21.0 − 21.0
II											{ + 6.0 − 6.0
III											
IV											{ + 3.0 − 3.0
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1972: I											{ + 8.0 − 8.0
II											{ + 6.0 − 6.0
III											{ + 1.0 − 1.0
IV											{ + 4.0 − 4.0
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1973: I											{ + 11.0 − 11.0
II											{ + 23.0 − 23.0
III											{ + 36.0 − 36.0
IV											{ + 46.0 − 46.0
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1974: I											{ + 26.0 − 26.0
II											{ + 76.0 − 76.0
III									+180.0		{ + 65.0 − 65.0
IV									−180.0		{ +129.0 −129.0
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1975: I											{ + 45.0 − 45.0
II											{ + 1.0 − 1.0
III									+180.0		{ +125.0 −125.0
IV									{ +180.0 −360.0		{ + 19.0 − 19.0
Outstanding	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
1976: I							+500.0				
II					+ 200.0				+360.0		{ + 14.0 − 14.0
III					+ 100.0		−500.0				{ + 37.0 − 37.0
October									−360.0		
Outstanding	-0-	-0-	-0-	-0-	300.0	-0-	-0-	-0-	-0-	-0-	-0-

This issue introduces the Bank's *Quarterly Review.* (The *Monthly Review* was discontinued after the October issue.) The new publication is designed for in-depth analysis of a range of domestic and international economic and financial developments. All *Monthly Review* subscribers will automatically receive the *Quarterly Review.* We hope that you will be pleased with the new publication.

Federal Reserve Bank of New York
33 Liberty Street
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