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This Quarterly Review is published by the Research and Statistics Function of the Federal Reserve Bank of New York. Among members of the function who contributed to this issue are SHARON P. SMITH *(on the Port of New York and New Jersey, page 1);* KENNETH D. GARBADE *(on the effect of electronic quotation systems on the Government securities market, page 13);* RONA B. STEIN *(on the New York City economy, page 24);* CARL J. PALASH *(on the impact of tax policy on investment incentives, page 30).*

The article on Treasury tax and loan accounts and Federal Reserve open market operations (page 41) was contributed by JOAN E. LOVETT *of the Open Market and Treasury Issues Function.*

A report dealing with the new supervisory system for rating all Federally insured banks (page 47) was prepared by GEORGE R. JUNCKER *of the Bank Supervision Function.*

An interim report of Treasury and Federal Reserve foreign exchange operations for the period February through April 1978 begins on page 51.

The Port of New York and New Jersey: Lifeline to the Region

New York and New Jersey jointly possess one of the greatest natural harbors in the world. The New York-New Jersey Port is also, by most standards, the busiest in the United States, with more vessels, general cargo, and international passengers passing through it than through any other port (Chart 1). The port leads the nation, too, in value of cargo handled in United States Customs Service collections.

In addition to serving as a point of arrival and departure for both trade and passengers, the New York-New Jersey Port is a hub of economic activity. Many different industries supply services necessary for port operations, including insurance, ships' chandlers, towing services within the port, and shipbuilding and repairing. At the same time, a network of land transportation and communications connects the port with points inland. Without a doubt, the New York-New Jersey Port—or Bi-State Port—makes an important contribution to the regional economy.

However, the port has suffered from numerous problems that have stunted its growth over the past three decades. To some extent, the port has mirrored the sagging economic fortunes of the Northeastern region of the nation. But the port has suffered from its own particular problems—developmental, regulatory, labor, and cost—that have hampered its growth and weakened its competitive advantage vis-à-vis other ports along the Eastern seaboard. The port's share of the total waterborne commerce of the United States has been declining steadily from 17.4 percent in 1948 to 9.8 percent in 1976 (Chart 2). The port has been able to retain its position as the busiest harbor in the country, largely because of the technological revolution of containerization.

The future holds both opportunities and difficulties for the Port of New York and New Jersey. The contribution of the port to the regional economy will depend on a multitude of decisions to be made in government, business, and labor. No attempt is made here to foretell the outcome of these decisions. Rather, this article deals with the economic forces that have contributed to or crimped the prosperity of the Bi-State Port and the current economic problems that will influence the port's ability to compete effectively in the future. While the total port encompasses air transportation, the focus here is on its marine operations.

This study would not have been possible without the assistance of many individuals who shared their knowledge of the workings of the port and of the industries that comprise it. In particular, thanks are due to Francis J. Barry, O. Carey, John J. Farrell, Kenneth W. Gundling, Amos Ilan, John P. Laufer, Melvin E. Lemmerhirt, David Malamud, Clifford O'Hara, George Panitz, Vice Admiral William F. Rea III, U.S.C.G. (Ret.), Hans G. Rieger, Robert L. Safarik, Vincent C. Smith, Nai-Ching Sun, Frank G. Tatnall, and Catherine S. Vandyck, none of whom bear responsibility for the opinions expressed herein.

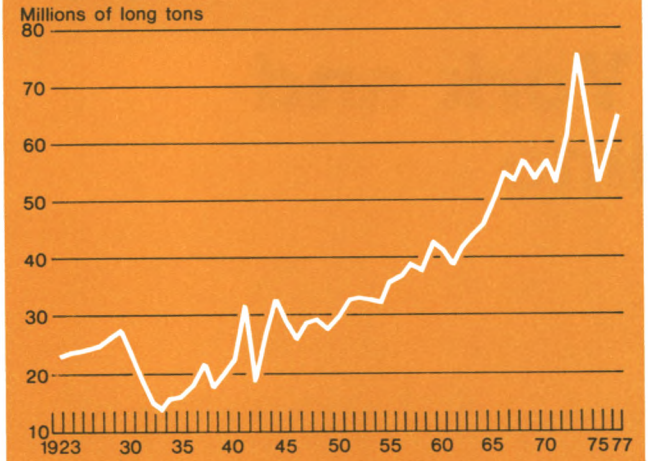
The Port of New York and New Jersey

Certain natural attributes of both sea and land facilitate the development of a port. Deep water, shelter from the open sea, little tidal variation, and security from silting and flooding are important qualities. No less important is the presence of flat land near enough to the harbor for both the development of industries

Chart 1

Oceanborne Foreign Trade of the Port of New York and New Jersey

Bulk and general



In addition, to this amount of foreign commercial trade it is estimated that approximately 56 million long tons of oceanborne coastal trade, intercoastal trade, and government shipments passed through the Port of New York and New Jersey. Thus, total oceanborne trade in the port in 1977 was approximately 121 million long tons.

Source: Port Authority of New York and New Jersey.

and cities and the location of waterfront warehouses. Because a port is the conjunction of land and water transport, extension of transportation and communications inland from the waterfront must be economically feasible. Being close to a very great concentration of population and commercial activity is another enormous advantage. A brief examination of the New York-New Jersey Port indicates that it possesses these qualities in abundance.

The geography of the Port of New York and New Jersey

The New York-New Jersey Port District covers an area of approximately 1,500 square miles and includes all or part of 17 counties and 213 municipalities. In total, the port has 750 miles of water frontage: 460 miles in New York and 290 miles in New Jersey. This definition was established in the Port Compact of 1921 under which New York and New Jersey pledged joint cooperation in the planning and development of the port, thus ending a long rivalry.

Under the terms of the compact, the Port Authority of New York and New Jersey is the principal administrative agency for developing and operating the seaports and airports and promoting commerce in the Port District. It is also responsible for planning, developing, and operating transportation and terminal facilities authorized by the states within a 25-mile radius of the Statue of Liberty. (It should be noted that other agencies and organizations have different definitions of the port area.)

The Port District has eight large bays, each bigger and with more potential as a developed port than many harbors elsewhere in this country or in Europe. It is ice-free, seldom hampered by fog, and has little tidal variation. The principal route through the port is Ambrose Channel, a ten-mile path between Sandy Hook and Rockaway point (map). This seaway, used mainly by oceangoing vessels, is maintained at a depth of 45 feet below mean water level and at a width of 2,000 feet. Numerous other channels of varying widths link all the bays of the port. Although containerships tend to have larger drafts (*i.e.,* the depth of water a ship draws when loaded) than conventional vessels, none have a draft much greater than 35 feet. Oil tankers, however, may have drafts of as much as 92 feet. Thus, the port is able to handle most oceangoing ships, with the exception of very large tankers. Only a few harbors on the West Coast have a significant advantage over the Bi-State Port because of their greater depths.

The economics of the port: the port service

In essence, a seaport's main economic service is the transportation of goods over water. However, it is often difficult to decide which specific industries comprise the "port industry". Past studies attempting to estimate the impact of the port on the region's economy have suffered to some extent from this problem.[1] Where such studies examine only the waterfront activities necessary for loading and unloading of cargo, they ignore other port activities such as cargo insurance and warehousing that are equally essential for the transportation of goods over water. Where the studies include as part of the port industry production activities in the port area regardless of output, they confuse geographical proximity with functional association. Where the studies include production of goods that are moved by water as part of the port industry, they confuse users of port services with suppliers of port services. An input-output analysis (a model through which the interrelationships and interdependencies of industries can be estimated in dollar terms) of the economic impact of

[1] Port of New York Authority, *The Port and the Community* (May 1956); and First National City Bank, *The Port of New York: Challenge and Opportunity* (June 1967).

this country's 170 major coastal and inland ports recently completed by the Port Authority of New York and New Jersey avoids these pitfalls.[2]

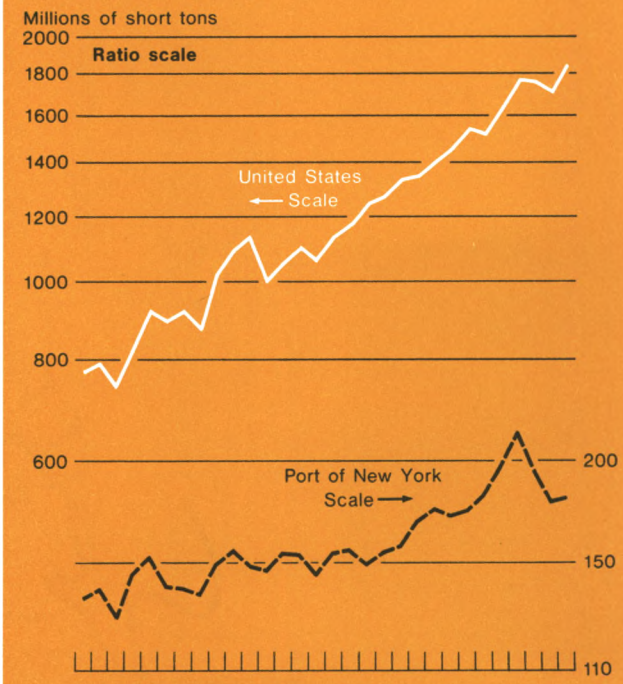
The national analysis of the Port Authority investigation provides a basis for assessing the impact of the Bi-State Port on the region's economy. The precise definition of the port industry is "any economic activity that is directly needed in the movement of waterborne cargo".[3] The relevant industries that together provide the port service then are those directly involved in moving goods over the water, transferring those goods from the means of water transportation to land conveyances, moving goods overland to the point of destination, or vice versa. Physical proximity to the piers is not necessary to be part of the port industry. Thus the port industry includes, for example, activities such as banking, warehousing, cargo documentation, and cargo insurance, as well as the actual carriage of goods over water. In this analytical framework, activities that are more removed in a functional sense from the basic port service, though still part of the port industry's economic impact, are not part of the port industry itself. These include such activities as shipment of exports and the supply of fuel, port machinery, and ship-repair services. Nevertheless, they do have an important bearing on the overall impact of a port on its surrounding region. Input-output analysis helps estimate both direct and indirect effects of the port industry on the economy. This is valuable since a port not only fulfills its vital function in water transportation but also generates jobs and income in other industries, as well as tax revenues at all levels of government.

Oceanborne foreign trade passing through the Bi-State Port in 1977 generated $5.1 billion in port industry revenues. This is based on the Port Authority input-output analysis estimate that the movement of every ton of waterborne cargo in United States foreign trade generates, on average, $53 of port industry revenues (in 1977 dollars). The port industry has further indirect or multiplier effects through the chain reactions a change in the demand for the port industry services generates. Thus the multiplier can measure the effects that ripple through the economy from the industries supporting the port industry because of a change in demand for the port service.

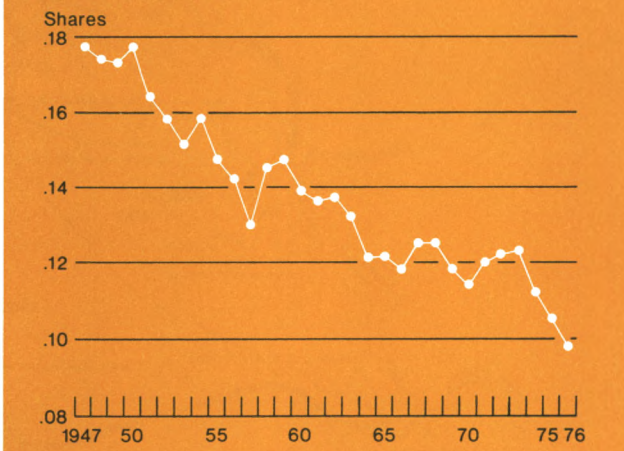
The estimated multiplier for the port industry is 1.6; that is, every dollar of port industry sales generates $1.60 in sales throughout the economy. In other words,

Chart 2

Net Total Waterborne Commerce in the United States and Port of New York and New Jersey



The Bi-State Port's Share of Net Total Waterborne Commerce in the United States



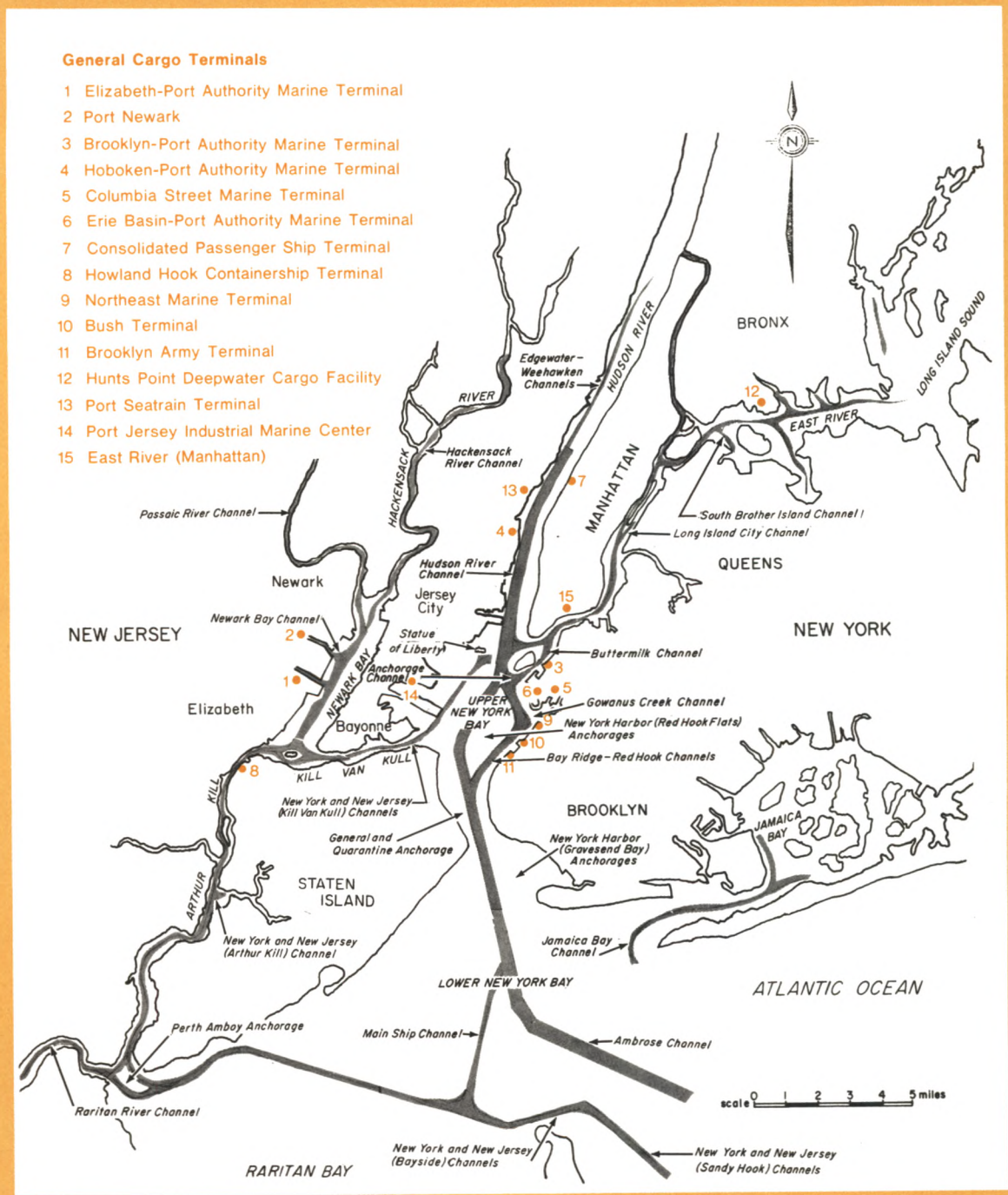
Includes total net traffic, eliminating all known duplications, i.e., foreign (imports and exports) and domestic (coastwise, lakewise, internal, local, and intraterritorial).

Source: United States Army Corps of Engineers, Waterborne Commerce of the United States, Calendar Year 1976, Part 1, Part 5.

[2] The Port Authority of New York and New Jersey, Planning and Development Department, *The Economic Impact of the U.S. Port Industry: An Input-Output Analysis of Waterborne Transportation*, Vol. 1, prepared for United States Department of Commerce, Maritime Administration (April 1978), pages 80-84.

[3] *Ibid*, page 17.

Major Federal Ocean Channels



Source: New York Port Handbook 1978 (published by the Maritime Association of the Port of New York and the Port Resources Information Committee, Inc.), pages 13, 14, and 18.

each ton of waterborne foreign cargo generates direct and indirect revenues of approximately $85 (in 1977 dollars). This means that foreign waterborne cargo passing through the Bi-State Port in 1977 generated at least $8.2 billion in sales throughout the national economy. Most of this impact was probably realized within the port region.

The operations of the port industry, of course, generate jobs as well as revenues. At the national level, every 600 long tons of waterborne foreign trade moved is estimated to have created one job, according to the Port Authority study. In 1977, waterborne foreign trade moving through the Bi-State Port created at least 161,000 jobs throughout the nation. Again, most of these jobs were probably within the port region.

The estimated revenue and employment effects per ton of cargo are greater for the Bi-State Port than for the average United States port. At the national level, exports and imports are largely low-value commodities which tend to generate low levels of employment. In the Bi-State Port, however, cargo is generally high value. In 1977, for example, the average value per long ton of general cargo passing through the port was $1,844, approximately 2.5 times the national average of $729. High-value cargo generally has greater employment and revenue-generating effects since it often requires special handling. Furthermore, the Bi-State Port is a regional center for certain port-related government activities such as the United States Coast Guard and a national center for port-related industries such as marine insurance. Thus some portion of the activity in the port-related industries in the Bi-State Port results from the demand for port services in other regions. Hence, it is likely that the estimates presented above represent a lower bound for the economic impact of the port industry on this region.

Study of the Port of New York and New Jersey requires separate analysis of each of the major industries that comprise either the port or supportive industries through which the indirect effects of the port are felt. Certain developments within these industries help explain the port's current economic position and may also affect its future.

The maritime industry

At the present time, shipbuilders and shipowners throughout the world are feeling the effects of reduced demand. Between 1965 and 1975, the world's merchant fleet increased from 157 million gross tons to 340 million gross tons. (Gross tonnage is the ship's total volume in cubic feet, and 100 cubic feet equal one gross ton.) However, with the sharp increase in oil prices in 1973-74 and the subsequent world recession, demand for both tanker and merchant ship services collapsed just as supply was increasing. Indeed, 354 tankers and 417 dry cargo ships (9 percent of the world fleet) stood idle at the end of April 1978.

As a result of the Federal subsidy program, however, the United States maritime industry is largely insulated from the effects of fluctuations in world demand for shipping services. Since the end of World War II, the United States maritime industry (*i.e.,* shipping and shipbuilding) has received more than $10 billion in direct Federal aid—not to mention a wide variety of indirect aid.[4] This protected position has had an important influence on the development of both United States shipping and shipbuilding. Bi-State Port users include ships of many flags, but particular attention is directed here to the United States flag merchant marine because it pioneered the technological innovations that have been essential to the port's economic prosperity.

United States flag shipping

During the last twenty years, leading United States shipping lines have pioneered the use of containerization—the most significant maritime technological innovation since the changeover from sail to steam. This is the shipping of cargo in large aluminum or steel boxes.[5] Due to its containerships the United States merchant marine is in a period of rebirth, while simultaneously conventional vessels are in sharp decline. (The number of United States flag conventional or breakbulk vessels, in which cargo is handled in nets or slings, has been declining since the end of World War II.) Conventional vessels have declined principally because of the competitive disadvantage of United States vessels relative to foreign-flag vessels. Operating and construction costs of American ships are the highest among major maritime nations. At the same time, productivity is approximately the same on all conventional vessels. Even with large Government subsidies, the United States merchant fleet has fallen from the position of the largest merchant fleet at the end of World War II to tenth place as a maritime power (measured in number of ships and total tonnage).

However, United States operators of containerships have been able to compete successfully against foreign lines *without* Government subsidies. The Port of New York and New Jersey has played a major role in the development of this new service and is the world's largest container port. Containerized shipping has benefited not only the port but also the New York-New

[4] For a thorough discussion and critique of these subsidies, see Gerald R. Jantscher, *Bread Upon the Waters: Federal Aids to the Maritime Industries* (Washington, D.C.: The Brookings Institution, 1975).

[5] These boxes have doors at one end and measure eight feet across, eight feet high, and come in sizes of ten-foot lengths up to forty feet.

Jersey region as a whole through the direct and indirect effects of this expanding demand for the port service.

One sector of the shipping industry which has declined in a relative sense for fleets of all flags and in all ports is that of passenger liners. Although there are still large numbers of individuals traveling by sea who pass through the Port of New York and New Jersey, the number has declined sharply since the early 1960's. This drop in passengers results from a reduced cruise market and a continuing decline in transatlantic crossings. At a more basic level, it reflects an increasing preference by travelers for the speed of air transportation.

Containerization: an idea whose time had come

Part of the recent decrease in number of United States flag ships is due to the spread of containerization. Because containerships tend to be larger and more efficient than conventional ships, more cargo can be carried on fewer ships. Thus a switch to containerization implies a reduction in the total number of ships in the fleet.

The movement to containerization began in the Port of New York and New Jersey.[6] Pan Atlantic Corporation, later Sea-Land, pioneered this service in 1955 by carrying cargo in experimental containers on a tanker between New York and Houston. After three months of service, handling costs had plummeted from $5.83 a ton to approximately $0.15 a ton. Sea-Land subsequently began containership service between New York and Puerto Rico. Handling costs on this service were established to be less than 5 percent of a conventional ship's costs, and the port turnaround time dropped from seven days to fifteen hours.[7]

In August 1962, construction began on the first specially designed container port. This harbor terminal complex includes both Port Elizabeth and Port Newark. The Port Authority's Elizabeth Marine Terminal represents a $215 million investment and has been called the "container capital of the world". Altogether, the Port Authority has invested approximately $528 million in marine terminals (of all kinds). At present, 55 percent of the oceanborne foreign general cargo trade (as defined by the Port Authority) in the port is containerized. With approximately 35 container cranes, the port handled the equivalent of 1,620,000 twenty-foot containers in 1976. Rotterdam, the world's second largest container port, handled the equivalent of 950,000 of these containers.

Table 1

Containerized Cargo by Selected United States Ports

Calendar year 1974; in thousands

Port*	Number of containers†	Number of total tons‡ (in long tons)
New York	583	8,038
Los Angeles	180	2,262
Norfolk	121	1,678
Baltimore	108	1,584
Oakland	101	1,290
Seattle	90	1,114
San Francisco	84	1,001
Long Beach	74	951
Charleston	36	615
Philadelphia	44	613
Houston	37	530
New Orleans	38	521
Miami	30	414
Savannah	27	364
Portland	24	331
Boston	22	314
All other ports	51	731
Total	1,650	22,351

* Ports selected on the basis of total tons moved.

† Mixed units of standard and nonstandard size containers.

‡ Includes military cargoes; a long ton is 2,240 pounds.

Source: United States Department of Commerce, Maritime Administraiton, *Containerized Cargo Statistics Calendar Year 1974* (August 1976).

New York's lead over the country's other container ports is enormous, whether measured by number of containers or total tonnage of containerized cargo handled (Table 1). In 1974 (the latest available data), the figures for both the number of containers and total tonnage of containerized cargo handled in the Port of New York and New Jersey were more than three times the levels recorded for Los Angeles, the nation's number two container port.

The rate of growth of containerization appears to have slowed throughout the United States shipping industry since 1974 because most cargoes that can be readily containerized have already been so adapted. Reflecting in part the fact that the United States has been the world leader in this technological change, a larger proportion of United States liner cargoes is containerized than foreign liner cargoes (57 percent versus 33 percent in 1974).

Containerization affects the maritime industry in

[6] For an excellent survey of the early history of containerization, see the supplement to *The Economist* (September 14, 1968).

[7] Although a United States flag line, Sea-Land does not operate under Federal subsidy. A line may prefer to be unsubsidized because once it is on Federal operating differential subsidy—a subsidy intended to offset the higher costs associated with operating a United States vessel rather than a foreign vessel—it is restricted to its specific trade route, possibly for as long as twenty years, and cannot switch operations to a more profitable trade route.

three different ways. First, because it decreases pier time from one day in port for every day at sea to one day in port for every four days at sea, vessel utilization increases significantly. Second, stevedoring becomes a much more capital-intensive process. Third, unit costs fall significantly with volume increases, mainly in loading and discharging cargo because of the high fixed-capital costs. In addition, there are substantial savings in packaging and claims, since containerized cargo is less subject to damage and theft.

Containerization has been only one of several technological developments—each consisting of some form of preloading which can be done away from the docks—that have made shipping more capital-intensive during the last fifteen years. One such innovation is LASH shipping, or Lighter Aboard Ship, in which freight ships carry preloaded barges of about 300 tons called lighters. Another is Ro/Ro Shipping, or "Roll on-Roll off" shipping, in which freighter ships are built with traffic ramps and trucks are driven on board to unload their cargo directly. Pallet ships, another innovation, have cargo loaded on portable platforms.

Prior to these technological innovations, the typical breakbulk freighter required six work gangs of eighteen men each as long as a week to unload. Such procedures, which are still necessary on the remaining conventional vessels in service, have actually changed little since the days of the ancient Phoenicians. By contrast, in the modern, automated container terminals, one or two work gangs can usually unload an entire vessel in one day. This major and rapid technological change has had an important impact on the jobs available to longshoremen.

Longshoremen and containerization

A reduction in the demand for longshoremen is evident from the sharp decline in membership in the International Longshoremen's Association (ILA) in New York from over 40,000 in the mid-1950's to about 20,000 in 1970 and to 11,000 in 1978. The longshore register remains closed. Only a relatively few new members have been added since 1969 to fill special needs. These circumstances have led the ILA to attempt to preserve jobs on the waterfront for their members.[8] The ILA was successful in obtaining major concessions in the form of a guaranteed annual income (GAI) plan and a job security program (JSP)—whereby carriers make up any shortfalls in existing funds for the GAI and for welfare and pension payments. (The GAI plan was first proposed in 1962 in response to a demand by the New York Shipping Association to reduce the size of the work gang on breakbulk ships and actually began in 1966. However, it has since helped ease the change for longshoremen to a market in which the demand for their services is sharply reduced.)

An especially noteworthy feature of the GAI plan is that it provides larger guarantees for the Port of New York and New Jersey than for any other port. The plan guarantees 2,080 hours a year at $8.80 an hour (this rate will increase to $10.40 an hour in the third year of the present contract which began October 1, 1977). The guarantee in Boston, by contrast, is for 1,700 hours of work per year, while in Baltimore it is for 1,900 hours. The guarantee in most South Atlantic ports is for approximately 1,250 hours.

Estimates indicate that there are on average only 7,500 jobs a day available for the 11,000 ILA members who are eligible for the GAI plan. When there is no work on a particular pier, the GAI plan is administered in the hiring hall for fill-in jobs on other piers according to a system of reverse seniority. The least senior ILA members are called first for jobs, while the most senior ILA members are most likely to receive their full minimum annual salary *(i.e.,* $18,304 at present but this will rise to $21,632 by October 1, 1979) without working.

Beginning in 1974, a full tonnage assessment was instituted on all oceanborne freight passing through the Bi-State Port as the means of funding the GAI plan. (Between 1969 and 1974, a combination tonnage and man-hour assessment was used.) This fee, which is paid by steamship operators, provides a fund to pay for the GAI plan as well as for the health services, pensions, welfare, and other benefits of the dockworkers. Although these tonnage assessments are not generally passed directly and immediately into the rates charged by steamship companies, they can have an important impact on the frequency with which a steamship line uses a port. In a joint effort by longshoremen and shipping-industry employers to reduce cargo-handling costs in the port, this tonnage fee was cut twice in 1976. From its all-time high of $8.28 a ton, it was reduced first to $6.85 a ton and then to $5.85. These reductions have been maintained to retain present users of the port and attract more ocean freight.

In many ports, longshore benefits are paid by an assessment on each hour longshoremen work rather than on tonnage moved. Longshoremen's productivity on breakbulk ships is fairly uniform along the Atlantic Coast at one-half ton per man-hour. Although the present longshore contract increased the number of hours

[8] The ILA contains four major district councils: Atlantic Coast, South Atlantic and Gulf Coast, Great Lakes, and West Coast. The Atlantic Coast District Council, which covers ports from Norfolk, Virginia, into Canada, has been the most important of these councils. See Vernon H. Jensen, *Strife on the Waterfront: The Port of New York since 1945* (Ithaca, N.Y.: Cornell University Press, 1974) for a thorough discussion of collective bargaining on the New York docks.

guaranteed in some ports, the guarantee remains more liberal in the Bi-State Port. Nevertheless, because there is greater tonnage handled in the port, the cost of supporting the GAI here is less for breakbulk carriers than in ports which support the fund through hourly assessments since that cost is shared by container carriers.

Because containerships usually carry greater tonnage than breakbulk but require fewer longshoremen per ton to load or unload, the tonnage fee is biased against operators of containerships.[9] At the same time, containerization is the reason for the need to reduce the longshore register. In recognition of this, container carriers have given full support to the GAI as a means of easing the transition through attrition to a stable, much smaller register. It is expected that the GAI plan will then decline in significance.

The Port of New York and New Jersey is at a competitive disadvantage relative to other Atlantic Coast ports for both container and breakbulk shipping with respect to the total terminal expenses for two reasons. First, terminal labor costs (that is, nonstevedore labor) are higher in this port because of traditionally higher manning practices. Second, the full terminal operating costs are much higher in the Bi-State Port because terminal operators here must pay full charges for leasing facilities, whereas in many other ports the local port authority retains ownership of the facility and charges a tariff for dockage and wharfage that does not cover actual costs. Thus, it is more expensive for shippers to use the Bi-State Port than other ports along the Atlantic Coast.

Shipbuilding and ship repair

Until shortly after World War II, the Bi-State Port was a major shipbuilding center. While many major shipbuilders currently are located on the East Coast, there is only one shipyard in the port with large shipbuilding capabilities—Seatrain, on the site of the old Brooklyn Navy Yard. There are about fourteen major shipyards in the port engaged in ship repairs. These yards are also capable of constructing smaller vessels (such as tug boats, barges, fishing boats) and offshore drilling units and equipment.

Certain ship repairs are necessary to assure that the vessel is in good operating condition. Although complete maintenance procedures should be done every year or every other year to assure efficient and safe vessel operation, the actual frequency with which a vessel is sent into drydock for this purpose depends on where it has been operating and on the coating on the hull. Other repairs, labeled voyage repairs, are necessitated by damages incurred during use of the vessel.

Although there is no question of choosing the geographic location of the yard to do certain ship repairs, the location of the yard doing the work is a very important choice variable for other repairs. Time is a crucial point to be considered in making such a decision, since anything that decreases the time the ship can sail decreases the income it can earn.

Labor costs in the port appear to be considerably higher than those in Southern shipyards. Although productivity may be slightly higher in the port's shipyards, the differences are not substantial. In addition, any shipyard in the port has potential problems with respect to other operating expenses. Because drydocks are raised electrically, shipyards use extraordinarily large amounts of electricity. Table 2 shows typical industrial electric bills in some representative cities in which shipyards are located. This suggests that shipyards operating in the port are at a disadvantage with respect to the utility portion of their costs and must compensate for it through changes in their technology to avoid losing a large proportion of their repair business to a low cost shipyard. These observations are consistent with the results of studies of regional variation in shipbuilding costs conducted annually by the Maritime Administration. The most recent of these reports (1977) suggests that the overall cost of shipbuilding is lower on the Gulf Coast than in New York.[10] There is, in general, ample availability of drydocks. Several yards contain graving docks (large drydocks permanently built into the water) for merchant ships. The important questions are whether the proper dock is available *at the time it is needed* and whether the cost differential between work performed in a shipyard in the port and that performed in a Gulf Coast shipyard exceeds the cost of lost sailing time from sending the vessel to a Gulf Coast yard.

If a repair job is sufficiently large, it is put out on bid. The yards in the port have been successful on many occasions in winning such bids. To some extent this success is the result of the large amount of shipping traffic into and out of the port. Thus, these yards have the advantage that ships they bid to repair are already stopping in New York. However, it has become increasingly difficult for port yards to compete against Southern yards for work on ships that are not scheduled to stop in the port.

As rising labor and utility costs reduce the ability of

[9] The JSP fund is also financed through tonnage assessments. However, these assessments are uniform throughout North Atlantic and Gulf Coast ports. The assessments do differ by type of cargo; the present assessments are 20 cents a ton for containerized cargo, 12 cents a ton for breakbulk cargo, and 2 cents a ton for bulk cargo.

[10] United States Department of Commerce, Maritime Administration, *Relative Cost of Shipbuilding* (June 1977).

Table 2

Typical Industrial Electric Bills, January 1, 1977

Billing category by peak demand level (kilowatts) and monthly consumption amount (kilowatt-hours)

City	Peak demand of 500 kilowatts 100,000 kwh	Peak demand of 500 kilowatts 200,000 kwh	Peak demand of 1,000 kilowatts 200,000 kwh	Peak demand of 1,000 kilowatts 400,000 kwh	Utility
Baltimore, Md.	$3,891	$ 6,420	$ 7,680	$12,308	Baltimore Gas and Electric Co.
Galveston, Tex.	$2,918	$ 4,587	$ 4,900	$ 7,901	Houston Lighting and Power Co.
Mobile, Ala.	$3,735	$ 5,739	$ 6,962	$10,844	Alabama Power Co.
New Orleans, La.	$4,011	$ 6,609	$ 7,654	$12,850	New Orleans Public Service Inc.
Newport News, Va.	$4,593	$ 6,354	$ 8,978	$12,036	Virginia Electric and Power Co.
New York, N.Y. (Manhattan)	$9,083	$13,593	$18,166	$27,186	Consolidated Edison Co. of N.Y., Inc.
Quincy, Mass.	$4,633	$ 7,746	$ 8,768	$14,994	Massachusetts Electric Co.

Source: Federal Power Commission, *Typical Electric Bills 1977.*

Table 3

Container Shipping Costs via Conrail, 1977*

In dollars

Point of origin	Point of destination	Charge for single container	Charge for double container	Difference from New York City for single container	Difference from New York City for double container
Peoria	New York City	708	1,132		
	Baltimore	621	1,005	87	127
	Philadelphia	655	1,059	53	73
Cincinnati	New York City	538	872		
	Baltimore	448	732	90	140
	Philadelphia	486	785	52	87
Chicago	New York City	645	1,045		
	Baltimore	576	934	69	111
	Philadelphia	594	963	51	82

* These figures are the costs of shipping a container via Conrail from point of origin to the railroad ramp at point of destination but do not include any longshore work.

Source: Subcommittee on City Management, Chairman, Assemblyman Charles Schumer, Counsel Dan Feldman, *Report on Railroad Cargo Facilities and the Port of New York* (August 1977).

shipyards in the port to win bids for the larger jobs, this means a relatively lower and more uncertain level of business. Such conditions discourage costly capital investments that, in the long run, help make the port's yards competitive with the Southern shipyards.

An important part of the attraction of the Bi-State Port for merchant shippers is the availability of docks for the repair and maintenance of most vessels. The shipping and ship-repairing industries depend critically on one another for their continued well-being.

Moving freight in the port

Landing cargo at a pier is only part of the service the port supplies. Goods must also be transported overland to or from the waterfront by either railroads or trucks. Many judge truck transport service in the port as the best in the nation. Rail transport service, however, appears to lag behind other ports.

Part of the traditional distinction between rail and truck transportation has been blurred by recent innovations in intermodal or "piggyback" service, *i.e.,* the long-haul movement of either trucks on railroad flatcars (TOFC) or containers on flatcars (COFC). These combine the national coverage of railroads with the local flexibility of trucks. This is, in fact, the primary system used in the Bi-State Port. It is estimated that nearly three quarters of the general cargo in the port moves in intermodal containers.

However, intermodal service is concentrated on the New Jersey side of the harbor, while the New York side has been cut out of such service because these railroad tracks cannot accommodate the size of the TOFC and COFC due to clearance restrictions on height and length of the new cars. This situation is expected to improve in the future.

Rail difficulties in the Port of New York and New Jersey are more complex than those associated with track renovations. The problems fall under three categories: rate equalization across Atlantic Coast ports, rate equalization within the Bi-State Port, and absence of direct overland rail service to the Brooklyn waterfront.[11] These undermine the competitive position of part or all of the Bi-State Port.

[11] Subcommittee on City Management, Chairman, Assemblyman Charles Schumer, Counsel, Dan Feldman, *Report on Cargo Facilities and the Port of New York* (August 1977); Statement of Louis F. Mastriani, Commissioner, Department of Ports and Terminals, City of New York, before the 12th Port of New York Congressional Breakfast (Washington, D.C., February 1, 1978), "Railroad Matters Affecting New York City's Port Facilities"; Statement of Peter C. Goldmark, Jr., Executive Director, The Port Authority of New York and New Jersey, before the 12th Port of New York Congressional Breakfast (Washington, D.C., February 1, 1978), "Railroad Rate Problems of the Port".

Rate equalization across ports

In a 1963 Supreme Court decision, rail rates for freight moving in conventional rail cars between inland cities and the Bi-State Port were equalized with those of competing ports. This decision has been viewed as an extension of the principles of the Shipping Act of 1916, which equalized transatlantic rates among East Coast ports so that no port would be at a competitive advantage over another. The decision is based on the reasoning that discriminatory freight rates are tariff barriers that "may arrest the development of a state or put it at a decided disadvantage in competitive markets". The ruling, which has been held to apply only to conventional cargo, is consistent with the general Federal policy toward port development that prohibits discrimination among ports by government or private action.

At present, Conrail (the Federally subsidized successor to the Penn Central and other bankrupt railroads) sets container shipping rates per unit that vary by distance. These are consistent with the rates of its principal competitors, motor carriers. The sole exception is that since 1972 Conrail has charged a low equalized rate on multiple containers (*i.e.,* 10, 30, and 60) that move on a single bill of lading between Baltimore-Philadelphia-New York and Chicago and St. Louis. Only in the Bi-State Port is the volume of traffic sufficiently large to justify 60-container shipments on which there is a cost advantage of $19 per container. Approximately 70 percent of Conrail's container traffic into the port on the Chicago-New York route consists of multiple containers. Charges on the remaining container traffic to New York from inland cities are as much as 20 percent higher than for cargo shipped to the more inland ports of Philadelphia or Baltimore (Table 3). An unsuccessful attempt was made to equalize container shipping rates from inland cities to North Atlantic ports through the Interstate Commerce Commission. Consequently, the port authorities of New York and New Jersey, Massachusetts, and Virginia have allied in an effort to have the Congress pass a rate equalization bill. At present, many shippers of nonmultiple containers prefer to use the Port of New York and New Jersey despite the cost differential, because it has more frequent and regular service to nearly all overseas destinations. However, such a choice is becoming increasingly expensive, since the shipper's absolute dollar saving on using other ports increases with every general percentage increase in rail freight rates while ocean freight rates remain equal for all North Atlantic seaports.

Rate equalization within the port

Another rail-related problem that may affect the future growth and development of the port arises from

rate differentials for container shipments across sections of the port. At present, most of the container traffic is directed to the New Jersey side. Most of the cargo on the Brooklyn piers is breakbulk. However, the shipping lines using Brooklyn piers are beginning to introduce containerized service on certain trade routes and a container terminal has been established at Northeast Marine Terminal. A new container terminal has also been established on Staten Island at Howland Hook.

Conrail does not provide service direct to any pier but rather to an intermodal terminal. Although Conrail has four container terminals in New Jersey, there has never been a rate or route established for container service to Brooklyn. Instead, container freight arriving from inland cities is shipped to Kearny, New Jersey, where it is loaded on trucks and hauled by toll route through Staten Island to Brooklyn at high drayage charges. ("Drayage" is the movement of containers from railroad ramps to the piers of seagoing vessels.)

Lower cost methods of shipment to Brooklyn are available. If Conrail were to establish a container subterminal in Greenville, New Jersey, and the Chessie System were to establish one at St. George, Staten Island, containers could be shipped to the Brooklyn piers via car float at reduced cost without the air pollution and traffic congestion associated with trucking. At present most *conventional* cargo (*i.e.,* breakbulk) arrives at the Brooklyn piers through float service from Greenville. However, Conrail maintains that it cannot afford to provide this additional service at the same rate when costs to Brooklyn are higher than to the New Jersey side of the port.

A direct rail connection to Howland Hook, though possible on tracks owned by Conrail and the Chessie System, is unavailable at present because a joint rate has not been set. Ocean carriers using this marine terminal want equal rate treatment with the New Jersey terminals which Conrail maintains it cannot provide and still earn the same return on its service to all areas of the port. Without rail service, all container shipments to Howland Hook must now be trucked from New Jersey at high drayage costs.

These rate differentials may have a decidedly negative impact on the future growth and development of the Brooklyn and Staten Island waterfronts. Present policies by state, city, and port authorities, putting greater emphasis on modernizing the New York side of the port, require cooperative effort to lower costs of shipping to the New York terminals in order to reduce these rate differentials.

Rail service to the Brooklyn waterfront

The third major problem in land transportation in the port is that there is no direct overland rail service to the Brooklyn waterfront. At present, the last 1,000 feet of the rail link from Oak Point in the Bronx via Hell Gate Bridge to Bay Ridge in Brooklyn has been left in disrepair. New York State has approved a $9.9 million contract with New York Dock Railway that is to be funded through proceeds from the Rail Preservation Bond Act of 1974. This will provide a new rail link between Conrail's Bay Ridge line and the 65th Street terminal in Brooklyn and rehabilitate certain other portions of the railroad system in the Bush Terminal area of Brooklyn. In a second phase of this project, the 65th Street terminal will be reconstructed to become the principal classification and rail terminal facility on the New York side of the port. A grant of $4.5 million from the Federal Railroad Administration is to cover part of this cost. However, these renovations will not resolve the clearance difficulties.

In the meantime, New York State has provided a $300,000 subsidy as a temporary measure to equalize drayage costs from railroad ramps on the New Jersey side of the port to the Brooklyn docks with the drayage costs to Port Elizabeth or Port Newark. (Drayage costs at present are more than $100 per container to the Brooklyn docks, compared with approximately $20 per container to the New Jersey terminals.)

Other rail difficulties

Another rail-related problem in the Port of New York and New Jersey results from navigational hazards arising from old railroad bridges and poses a potential obstacle for the continued health and the future development of the port. The bridge which is the principal cause for concern is the Central Railroad of New Jersey's Lift Bridge across Newark Bay. It is used only for a Bayonne passenger shuttle train service with ridership that has decreased from 2,400 daily in 1967 to 400 in 1976. With the growth of the container terminals in New Jersey, Newark Bay has become an increasingly important waterway; annual vessel traffic there rose from about 17,600 in 1963 to more than 49,000 in 1976. The bridge machinery is old and subject to frequent breakdowns. Moreover, with the increasing size of containerships, the hazards associated with negotiating the narrow span of the open lift bridge have intensified. In 1972, a Coast Guard report concluded that removal of this obstruction (at an estimated cost of $12 million) was preferable to alteration (at an estimated cost of $63.7 million). However, before the Coast Guard can act to remove the bridge, the Bayonne shuttle must first be terminated and then the Congress must appropriate the funds that have been authorized in the 1978 budget.

Another problem arises as a consequence of several rulings of the Federal Maritime Commission (FMC).

Under General Orders 8 and 26 of the FMC, now under review, the Bi-State Port is subject to stricter restrictions with respect to the amount of "free time" cargo may be held on dock without demurrage *(i.e.,* storage charges) than at any other Eastern port. Of all Eastern ports, only the Bi-State Port is subject to free time restrictions on imports and only the Bi-State Port and Philadelphia are subject to such restrictions on exports. In the Bi-State Port, the free time limit varies from five to ten days for imports and from ten to fifteen days for exports, depending on the type of cargo. In ports without such restrictions, free time may be as much as forty-five days.

Rules for setting and changing demurrage rates also vary among ports. Where rates are filed with the FMC, they can be changed automatically on thirty days' notice in all ports except the ports of New York and New Jersey, Philadelphia, and San Francisco, where an appeal to the FMC is required. Consideration of free time restrictions and demurrage charges is particularly important for shippers of bulk commodities. These rules place the Bi-State Port at a relative disadvantage in shipping bulk commodities. There are valid reasons for free time and demurrage rules to vary across ports. However, there is no obvious justification for differences in the procedures for setting these rules.

Offshore drilling in the Baltimore Canyon and the Bi-State Port

From a long-term perspective, offshore oil drilling in the Baltimore Canyon may have a very large impact on the Port of New York and New Jersey through an increase in demand for marine insurance, shipbuilding, and other supportive services. In August 1976, the Federal Government sold leases amounting to $1.1 billion to private companies covering drilling rights in the Baltimore Canyon area. This extends 75 to 135 miles south of Long Island and 55 to 100 miles east of New Jersey. Early estimates indicated that approximately 12 percent of the United States outer continental shelf production of oil and gas in 1985 will come from areas off the Atlantic coast (this includes North Atlantic, Mid-Atlantic, and South Atlantic).[12] Although the first two exploratory wells were dry holes, industry spokesmen have estimated that the chances of finding oil or gas in the Canyon area are between one in five and one in ten. Although no commitments have been made, there is ample cause to believe that, if a large discovery is made, the Bi-State Port and the region may nevertheless obtain much of the business—such as construction of drilling platforms (at an estimated cost of $100 million) and a pipeline to transport the oil, refining oil, processing gas, and shipping finished fuel products.

[12] Frederik W. Mansvelt Beck and Karl M. Wiig, *The Economics of Offshore Oil and Gas Supplies* (Lexington, Mass.: Lexington Books, D.C. Heath and Company, 1977), page 117.

Outlook

By most measures, the Port of New York and New Jersey is the number one port in the country, a position it has held since 1800. It has played a principal role in the evolution and spread of containerization. However, a number of impediments have affected port development. These include: higher labor and other operating costs than in competing ports; higher rail freight rates for some containerized cargo than in competing ports; inadequate rail services to sections of the port; and potential navigational hazards in important sections of the port.

Action has been taken in several areas: the tonnage assessment has been reduced, Congressional effort has begun to equalize container rail freights to competing ports, and the first steps have been taken to improve rail service to the Brooklyn waterfront. Continuation of these actions as well as renewed effort in other areas are essential for the future prosperity of the port.

The Port of New York and New Jersey will probably still be the number one port in the country in the year 2000. However, many changes are anticipated. An important change is expected in the near future in the handling of petroleum. Because the port cannot accommodate large tankers and the dredging costs to achieve this purpose are prohibitive, it is probable that offshore tanker terminals will be built instead. Petroleum would then be shipped by pipeline or smaller tanker vessels. It is very likely that such a terminal will be in operation by the year 2000. Improving economic conditions in the region will have a positive impact on the port, for the economic health of both are intimately related. However, it is vital that the port do more than rest on past achievements. Aggressive activity in new areas—such as containerization of new trade routes and the establishment of light construction bases within the Port District for support of offshore drilling activities—would strengthen the port's position as the national leader in the port industry in the future. Beyond this, such action could contribute significantly to a return to prosperity for the region.

Sharon P. Smith

Electronic Quotation Systems and the Market for Government Securities

Since 1973, the trading structure of the Government securities market has undergone a remarkable transformation. The origins of this transformation can be traced to the introduction of electronic quotation systems into the market by private entrepreneurs. These systems disseminate quotations for the purchase and sale of Treasury and Federal agency securities so rapidly and widely that what was once a partially fragmented dealer market has evolved toward an integrated auction. This article reports on the electronic quotation systems currently used in the Government securities market and on their consequences for the trading structure of the market.[1]

Electronic quotation systems

All the electronic quotation systems used in the Government securities market have been developed by private entrepreneurs. The systems do not receive any subsidy from, nor are they regulated by, the United States Treasury, the Securities and Exchange Commission, or the Federal Reserve System. Rules governing the use of each system are established by the respective sponsors. The electronic quotation systems currently in use can be divided into two categories: billboard systems and execution systems.

Billboard systems

A billboard, as the name implies, is a system through which a market participant can show on video screens his bid and offer quotations simultaneously to a large number of other participants. Billboards are a relatively recent development in the Government market. One system became operational in 1977 and a second is now under development. Participants who show their quotations on a billboard are called contributors. At the present time, both systems are soliciting only reporting dealers[2] to become contributors. Market participants, including both dealers and nondealers, who rent video screens displaying contributor quotations are called subscribers or recipients.[3]

A dealer showing his quotes on a billboard system enters bid and offering prices on a standard run of issues (see box on page 14). A billboard identifies by name the dealer submitting a particular quotation. A customer interested in acting on a quotation must contact the contributing dealer directly, *i.e.,* outside the

This study would not have been possible without the assistance of many market participants, including especially Jack L. Billhardt, Richard Fieldhouse, Jay Pomrenze, Scott Rumbold, Lawrence J. Saffer, Thomas W. Sullivan, Henry Wattson, and Esther Zimet, none of whom bear responsibility for the opinions expressed herein.

[1] The market for United States Treasury and Federal agency securities is described more fully in Christopher McCurdy, "The Dealer Market for United States Government Securities", *Quarterly Review* (Winter 1977-78) pages 35-47. See also the description of the Federal agency market in Lois Banks, "The Market for Agency Securities", *Quarterly Review* (Spring 1978) pages 7-21.

[2] In this article, we use the term "dealer" in the sense of a broker-dealer firm or commercial bank which reports its positions and transactions in Government securities to the Federal Reserve Bank of New York for inclusion in the data published by the Bank. At present, there are thirty-five reporting dealers.

[3] Currently, a dealer cannot be a recipient unless he is also a contributor.

Video Screens for Electronic Quotation Systems

Pictured below is a representation of the bid and offered discount rates for three Treasury bills and bid and offered prices for seven Treasury coupon issues quoted by four dealers as they appeared on the video screen of a billboard system at about 2:30 p.m. on June 7, 1978. Prices for coupon issues are quoted in percentage of par value, with fractions of a percent expressed in 32nds. The bid of 99.29+ by dealer A on the 8 percent note maturing in May 1980 means a bid of 99 plus 29½/32 percent of par value. The numbers to the right of the decimal point are in 32nds, and the plus means an additional ½ of a 32nd of a percent.

Billboard screen

Issue	Dealer A Bid	Dealer A Ask	Dealer B Bid	Dealer B Ask	Dealer C Bid	Dealer C Ask	Dealer D Bid	Dealer D Ask
Three-month bill*	6.64	6.62	6.64	6.62	6.64	6.62	6.64	6.62
Six-month bill†	7.115	7.095	7.12	7.10	7.12	7.10	7.12	7.10
One-year bill‡	7.36	7.34	7.36	7.34	7.36	7.34	7.36	7.34
8 percent May 1980	99.29+	99.30+	99.29+	99.30+	99.29+	99.30+	99.29+	99.30+
8¼ percent June 1982	100.3	100.5	100.4	100.5	100.4	100.5	100.4	100.5
7⅞ percent May 1983	98.18	98.20	98.18+	98.20+	98.18+	98.20+	98.18	98.20
8 percent February 1985	98.23	98.27	98.23	98.27	98.24	98.26	98.24	98.26
8¼ percent May 1988	99.5	99.9	99.7	99.9	99.7	99.9	99.7	99.9
7⅞ percent February 1993	95.8	95.10	95.8	95.10	95.8	95.10	95.7	95.11
8⅜ percent August 2000	98.31	99.1	98.31	99.1	98.31+	99.1+	98.31	99.1

* Bill maturing September 7, 1978. † Bill maturing December 7, 1978. ‡ Bill maturing May 29, 1979.

Video display screens for execution systems show only the highest bid and the lowest offer in each issue. If the same four dealers had entered the *same* bids and offers as those shown above into an execution system (which they need not have done), the video screen for that system would look like the representation below.

Execution screen

Issue	Bid	Ask
Three-month bill	6.64	6.62
Six-month bill	7.115	7.10
One-year bill	7.36	7.34
8 percent May 1980	99.29+	99.30+
8¼ percent June 1982	100.4	100.5
7⅞ percent May 1983	98.18+	98.20
8 percent February 1985	98.24	98.26
8¼ percent May 1988	99.7	99.9
7⅞ percent February 1993	95.8	95.10
8⅜ percent August 2000	98.31+	99.1

In contrast to billboard screens, bidders and offerers are not identified on execution screens. A transactor has to call a sponsor to complete a purchase or sale. The operational execution screens also show the size of a bid or offer, *e.g.*, $1 million of Treasury bills, although this is omitted above.

billboard system, to complete a transaction. Contact is typically accomplished by a telephone call to one of the dealer's salesmen or traders.

Since a billboard system is an advertising device with no capability for order execution, all billboard quotes are subject to change when a customer calls a contributing dealer. That is, a dealer makes no binding commitment to buy at the bid quote or to sell at the offer which he shows on a billboard screen. In the jargon of the market, quotes are "subject". This flexibility is important in rapidly moving markets when dealers may not be able to keep their quotations current. Of course, dealers who consistently fail to maintain current quotes, or who back away from their market by lowering their bids or raising their offering prices, face the likelihood that customers will begin to ignore their quotations.

Contributors pay a rental fee for the opportunity to show quotes on a billboard system. The attractiveness of a system depends directly on how many customers a dealer can reach through that system. At present, the single operational billboard system has a large base of subscriber-recipients outside the United States and is increasing its domestic subscriber list. The planned system will be exhibited through an existing telecommunications network with a substantial domestic subscriber base.

Recipients also pay a fee to rent billboard screens. They derive value from a screen because it reduces their cost of determining the bid and offer quotations of contributing dealers. This cost includes telephone charges, the implicit value of the time spent in getting quotes from different dealers, and the risk of a change in market prices during that time interval. The value to customers of a billboard hinges on the ease with which they can simultaneously check the prices of several competing dealers through the same system.[4] Thus, the ability of billboard vendors to sign up contributing dealers as well as recipients is critical to their earning enough on rental fees to cover the costs of their physical facilities.

Execution systems

Execution systems also disseminate bid and offer quotations over video screens but do not disclose the identity of contributors (see box on page 14). When a participant wants to sell into a bid shown on an execution screen, he calls the sponsor of the screen and indicates his sale interest. The sponsor buys the security from the seller and simultaneously resells the same security to the original bidder. A similar process occurs when a participant wants to take an offering shown on an execution screen. Thus, a sponsor is on the other side of every trade completed in his system. Sponsors of execution screens are usually called brokers as a reflection of their intimate participation in transactions. Unlike sponsors of billboard screens, who only disseminate information, brokers provide "live" markets to their customers.

At the present time, there exist three operating electronic execution systems in the Government securities market. A fourth system is under development. The first execution system began operating in 1973 and is available on an equal basis to both reporting dealers and some institutional nondealer investors such as savings and loan associations and nondealer commercial banks. The second and third execution systems (introduced in 1974 and 1975, respectively) and the planned system are available only to dealers. Market participants must be dealers before they can enter new quotations or act upon existing quotations in those systems. These systems service the interdealer market in Government securities. We will call the first system the "institutional execution system" to distinguish it from the interdealer execution systems.[5]

Sponsors of execution systems do not charge rental fees but rather earn revenues in the form of brokerage commissions.[6] They make those commissions only when trades are executed. The commission is paid by the participant initiating a transaction. Thus, buyers who enter bids on a screen buy at their bid prices if their bids are "hit". Participants who initiate trades by "hitting" bids receive the bid price less a brokerage commission to the sponsor. A participant who takes an offering pays the quoted price plus a commission, while the ultimate seller receives the full offering price which he quoted.

Sponsors of execution systems require contributors to stand on their quotations for some minimum interval of time, usually two or three minutes.[7] Unlike quotes

[4] As indicated in the box on page 14, the operational billboard system displays bid and offer quotations arrayed by dealer rather than in order of high bids and low offers. The National Association of Security Dealers Automated Quotation System (NASDAQ), which is a computer-based billboard system for the over-the-counter equities market, automatically sorts dealer bids and offers on an issue by price priority.

[5] The video screens showing bids and offers in the institutional system are available for *information* purposes to the public generally, but market participants must demonstrate acceptable creditworthiness before they are allowed to *trade* through that system. Interdealer execution screens are not available to nondealers even for information purposes.

[6] One sponsor does charge a monthly rental fee but reduces that fee by brokerage commissions paid by a customer.

[7] Quotations submitted to one execution system are good until canceled, but employees at that system know contributors well enough to kill quotations after an interval of time which varies according to the style of individual contributors.

on a billboard system, which are always "subject", quotes on an execution system are initially firm and may be acted upon without the sponsor recontacting the contributor. After an interval of time, quotations shown on execution systems turn stale and become subject. If somebody calls a sponsor to act on a stale quote, the sponsor has to check with the party who submitted the quote to see if it is still good.[8]

Electronic quotation systems and the size of transactions

In any market, purchasers and sellers are concerned not only with the prices at which they can trade but also with the size of a transaction. In a billboard system, customers make direct contact with contributors and the size of a transaction is a matter for their private negotiation. In practice, dealers will usually buy at their bid price (or sell at their offering price) at least one unit of a conventional-size block of securities, such as $5 million of a recently auctioned Treasury bill, $1 million of a short-maturity Treasury coupon issue, or $½ million of a Federal agency or long-maturity Treasury coupon issue. Dealers may also be willing to transact, at their quoted prices, in modest multiples of a conventional block. However, a customer request for an unusually large trade will generally bring forth a lower bid or a greater offer quotation than a dealer may be showing on a billboard screen. The less favorable price to the customer reflects the dealer's perception of greater risk in positioning a large block of securities in his own inventory.

Direct negotiation between buyers and sellers is not feasible in an execution system since transactors do not know each other's identities. Quotations submitted to execution systems are for multiples of a conventional-size block of securities. Most contributors initially submit quotations for only a single conventional block, even if they have larger purchase or sale interests. Multiblock orders can, however, be completed through any of the existing execution systems. When, for example, a buyer calls a sponsor to take an offering, he can indicate that he has an interest in further purchases at the same price. The sponsor will then call the original offerer and ask whether he has any further selling interest at that price. If the offerer has more securities to sell, the sponsor will show them to the buyer. This process of "working up" the trade continues until either the buyer or seller is satisfied.

[8] Sponsors of execution systems call contributors to encourage them to renew or "refresh" their stale quotes. If a contributor declines to renew, a sponsor will usually remove the quote from his screen entirely.

Dealer markets

To understand the impact of electronic quotation systems on the Government securities market, it is useful to consider first the nature of dealer markets. Although the word "market" connotes some unified whole, prior to 1973 the Government market was much more like a collection of somewhat fragmented and partially independent market centers. This section identifies those forces that reduce fragmentation and foster market integration. The next section relates those forces explicitly to electronic quotation systems.

What dealers do

Dealers provide liquidity to their customers by making available bid and offer quotations at which a customer can secure immediate execution of an order.[9] As long as dealers actively make markets, customers are saved the expense of searching directly among other investors for compatible trading partners. The dealer community thus serves as a focal point for the exchange of securities. Moreover, by buying and selling for their own accounts, dealers use their inventories as a buffer to moderate transient fluctuations in public purchases and sales. Dealers also trade with other dealers as well as with nondealer customers. Interdealer trading is an important facet of dealer markets and allows dealers to smooth out among themselves random and undesired inventory imbalances.

Although competition among dealers for customer orders is sharp, dealers infrequently quote identical prices. This phenomenon is known as price dispersion. At any particular time some dealers may be better bidders because they want to accumulate inventory, possibly to take advantage of speculative anticipations of price increases. Conversely, other dealers may quote aggressive offering prices because they want to reduce their positions.

In an extreme case, one dealer may bid at the offering price quoted by a competitor. If the two dealers get in touch, the bidder will buy securities until he lowers his bid or the seller increases his offering price. Thus, as long as dealers remain informed

[9] This definition of liquidity treats the interest of buyers in uncovering offerings of securities symmetrically with the interest of sellers in uncovering bids. Although liquidity is most frequently considered a problem when prices are falling and bids are scarce, it is equally a problem when prices are rising and offerings are scarce. It should be noted that dealers provide other services to their customers, such as economic analysis and portfolio advice. They may also serve an important role in evaluating the credit risks of nondealer market participants. Thus, two nondealers might prefer to trade with a dealer rather than directly with each other if they have confidence in the dealer's ability to evaluate the creditworthiness of the other nondealer. In this article, we are concerned exclusively with dealers as providers of liquidity to the market.

of the current quotations of their competitors, interdealer trading limits price dispersion to the extent that no dealer should be bidding at the offering price of another dealer. Less extreme price dispersion can persist, however, as long as it is small enough that no two dealers have mutually compatible purchase and sale interests.[10]

In the presence of price dispersion, customers cannot be indifferent about the choice of a dealer with whom to trade. Suppose, for example, dealer-customer trading relationships were strong and customers consistently went to the same dealers to complete their purchases and sales. Those customers would have no guarantee that they could not get a better quote from another dealer. Markets characterized by strong dealer-customer relations are likely to be quite fragmented, in the sense that dealers would have little incentive to keep their bids and offerings in line with the quotations of their competitors. In a fragmented market, dealers can buy at bid prices lower than the best bid in the market and can sell at asking prices greater than the lowest available offering quotation.

Customer search for best execution

From the incentive to obtain best execution of their orders, customers search among dealers for favorable quotations. Their willingness to search tends to break down dealer-customer trading relationships. Moreover, their search increases the probability that a high bidding dealer will complete a purchase and decreases the chances of a customer selling to a weaker bidder. Customer search for best execution plays an important role in enforcing the integration of a competitive dealer market. Given this customer search for best price, dealers with a genuine purchase interest have to be cognizant of the bid quotations of their competitors. The more aggressively they quote their own bid relative to other bids in the market, the more likely they are to complete a purchase ahead of those competitors.

In view of the importance (to the integration of a dealer market) of customer search, identification of the determinants of those search efforts is of some interest. One important determinant is the cost of searching, *i.e.,* the cost of obtaining a bid or offer quotation on a transaction of a given size. This cost includes telephone charges, the implicit value of the time spent by a customer in getting a quote, and the risk that prices may move against a customer if he conducts a prolonged search. In general, the lower this cost the more intensively a customer will search and the more discriminating he will be in accepting or rejecting quotations.

Consequences of reducing the cost of searching

For analyzing the effect of electronic quotation systems on the market for Government securities, a crucial question is what happens to a market when customer search costs fall? Drawing upon the foregoing discussion, we can anticipate a greater propensity for customers to seek out favorable executions. By implication, those dealers quoting more aggressive bids and offerings will become more likely to execute transactions relative to their less aggressive competitors. Customers who previously felt further search worthwhile only if they thought they could get a bid 1/32 percent of par value better may, in an environment of cheaper search, be willing to look for improvements in price of 1/64 percent or even 1/128 percent. Thus, dealers who previously could expect to do business at a bid 1/32 percent below the best bid would find they have either to improve their bid to within 1/64 percent or to give up any expectation of attracting the interest of customers selling securities. As search costs decline, dealers experience increasingly severe price competition from other dealers.[11]

As search costs become negligible, the trading structure of a dealer market undergoes a qualitative change. When information is essentially free and instantaneously available, no customer will sell at any price below the best available bid and no customer will buy at a price greater than the lowest offering price. Transactions will not occur except in the order of their price priorities. Price priority of execution is, of course, one distinguishing characteristic of an auction market. Thus, as search costs fall, a dealer market will evolve from a market of imperfectly competing dealers toward a purely competitive, integrated auction market.

The characterization of a market as an integrated auction implies the absence of any meaningful dealer-customer trading relationships. In particular, customers perceive every dealer as a potentially perfect substitute for every other dealer, and hence perceive the dealer

[10] Interdealer trading limits the range of dealer bid prices to the largest bid-ask spread quoted by any dealer. This follows because the maximum bid must be less than the minimum offer, but the minimum bid must be at least as high as the minimum offer less the largest spread quoted by any dealer. A similar argument shows that the range of dealer offering prices is also limited to the largest dealer spread.

[11] As dealers are forced to quote closer to the best available bid and offer, they necessarily narrow the bid-ask spread between their quotes. Such a reduction of spreads has occurred in the institutional sectors of the Government securities market but would not necessarily be evident from an examination of dealer quotation sheets, which report bid and offering prices for trades of a much smaller size.

community as a whole as the provider of liquidity. The only characteristic which distinguishes different dealers is whether their bid and offer prices are or are not the best available.

What electronic quotation systems have done to the Government securities market.

Electronic quotation systems have reduced the cost of uncovering favorable bid and offer quotations on conventional-size blocks of Government securities. By the process outlined in the preceding section, they have thereby fostered the integration and efficiency of the market and have changed the pattern of trading to something approaching an auction process. This section considers in greater detail the impact of billboard and execution systems on the transactional structure of the Government securities market.

Billboard systems

Both the existing and the planned billboard systems are compatible with the historical framework of the Government market. Through those systems, a dealer can advertise his bid and offer prices to a wide customer audience. Prior to the introduction of billboards, whenever a customer wanted a quote from a dealer he had to call a salesman employed by that dealer. For a customer to keep in constant touch with the Government market during the day was an expensive and time-consuming task both for the customer and for the dealer.

With billboard systems in place, dealers can advertise to a potentially unlimited number of subscribing customers at a fixed cost. Similarly, customers can use a billboard system to monitor changes in a dealer's bid and offer markets at little cost to themselves and at no direct cost to the dealer.[12] More importantly, when customers do decide to execute a purchase or sale, they can obtain comparative quotations from a number of dealers instantaneously and at virtually no cost.

The consequences of obtaining bid and offer quotes at zero cost are clear. No dealer can expect to receive requests to purchase or sell securities unless his quotations are at least as good as those of every other dealer. For transactions of a conventional size, billboard systems would appear to enforce price priority of executions.[13]

Billboard systems may have little or no effect on the structure of trading in issues not listed on the screens. In the box on page 14, bids and offers on only the most actively traded Treasury bills and coupon issues are displayed on the screen. Trading in less active securities depends entirely on more expensive direct dealer-customer communication. The markets for those securities are, consequently, more fragmented than the markets for securities listed on billboard screens.

Billboard systems may also have little effect on the markets for transactions in unusually large blocks of securities. Dealers are unlikely to quote large block purchases or sales at the same prices they show on a billboard screen for conventional-size trades. A customer seeking to trade a large block may, therefore, derive relatively little information from billboard quotations and consequently will have to contact individual dealers directly.

Execution systems

In describing the effect of electronic execution systems on the Government securities market, it is useful to consider first those systems available only to dealers and then to consider the system available to both nondealers and dealers. The latter system has opened some unique trading opportunities for nondealers.

Like the billboard systems, interdealer execution systems are compatible with the framework of the Government market which existed at the time they were introduced. Since about the late 1930's, brokers have facilitated trading between Government securities dealers. A dealer wishing to bid his competitors anonymously for an issue would call a broker and ask him to show his bid to those competitors. If the bid were hit, the broker would buy the issue at the bid price (less a commission for himself) and simultaneously resell the issue to the original bidder. Interdealer electronic execution systems follow this pattern but provide faster dissemination of new bids and offerings. In place of a broker calling several dealers sequentially, electronic systems permit the display of new quotations to all dealers simultaneously.[14] Moreover, the computer programs supporting the execution systems automatically displace old quotes with recently arrived better bids and offerings. Every dealer sees the best bid and offering prices which a sponsor has received on any given issue. Price priority of execution within a system is guaranteed. Since dealers can compare quickly quotes reported by competing systems, there is intersystem price priority as well. Electronic execution sys-

[12] Nondealers can also monitor changes in bids and offers on the institutional execution system available to nondealers. The video screens supporting that system are generally available for information purposes.

[13] This result may not hold in rapidly moving markets if dealers do not update their quotations on a timely basis.

[14] Sponsors of interdealer execution systems are in fact commonly called "screen brokers" to distinguish them from verbal brokers. The first screen broker entered the interdealer brokerage business *de novo*, but the second screen broker previously provided verbal brokerage.

tems have thus transformed interdealer trading of securities in conventional-size blocks into a virtual auction process.

Interdealer execution screens have also led to operational economies in the Government market. Prior to the screens, brokers called dealers to inform them of the bids and offerings of other dealers. A not insignificant fraction of a trader's time was devoted to listening to brokers' quotations. The screens have reduced the need for any verbal communication between a broker and a trader other than when a trader wants to enter a quotation or execute an order.

Since buyers and sellers do not communicate directly through an execution system, they cannot themselves negotiate the size of a transaction. However, as was pointed out in the first section, sponsors provide a vehicle through which trades can be "worked up". The combination of anonymous executions and the opportunity for "workups" may facilitate the completion of large purchases and sales in the interdealer market. If a buyer of $100 million of Treasury bills takes an offering of $1 million of those bills shown on an execution system, he can continue to buy until his order is filled or until the seller is satisfied. If the seller drops out first, the buyer can bid for additional bills at the previous transaction price with the hope of attracting further sellers. At no point need the buyer disclose the full extent of his interest.

The primary effect of interdealer execution systems has been the transformation of interdealer trading to an auction process, but those systems have also had consequences for dealer trading with customers. Prior to the advent of video screens showing dealer quotes continuously, a nondealer customer calling a dealer could get only the bid and offer quotes of that single dealer. With the innovation of the screens, a customer can now ask a dealer for the best bid or offer showing in the interdealer market as well. (Nondealers cannot rent interdealer screens, and hence can neither observe nor trade in the interdealer market directly.) A customer is unlikely to be willing to sell a conventional-size block of securities to a dealer at a substantially weaker bid than that showing in the interdealer market. Thus, the existence of screens tends to set a lower limit on dealer bid prices to customers and an upper limit on dealer offering prices. Dealer prices on trades of a conventional size cannot differ from quotations on the screens by more than a reasonable spread earned by a dealer who trades with a customer and then immediately reverses the transaction in the interdealer market.

The ability of a dealer to turn over customer orders in the interdealer market is another manifestation of the principle that, in an environment where information on bids and offers is essentially free, liquidity for conventional-size orders is provided by the dealer community as a whole and not by individual dealers. If a customer's trade does not "fit" one dealer, it can be completed easily with a competitor. Through a billboard system, customers can determine for themselves the dealer who best fits their interests. With interdealer execution systems, if a dealer does not want to do a trade at his own risk at the best prevailing bid or offer, he can act as an agent for his customer and complete the trade in the interdealer market. In either case, the customer receives the benefit of the best available quote. These conclusions do not extend, however, to markets in inactive issues or large block transactions where dealer bid and offer quotations are not quickly and cheaply available on screens.

That electronic quotation systems foster price competition among dealers has not gone unnoticed. Dealers lacking a strong base of traditional customers have been among the most enthusiastic users of the systems. A perennial problem experienced by such dealers was getting customer enquiries for bid and offer quotations. This problem reflected the stronger customer-dealer trading relationships which prevailed when search was more costly. Electronic quotation systems have increased the "visibility" of aggressive quotations and hence have given new dealer entrants in the Government securities market a greater opportunity to participate in trades.[15]

The institutional execution system, through which nondealer institutions as well as dealers can trade, exhibits the same characteristics as the two interdealer execution systems but has one important added feature: it offers a vehicle for nondealers to show their own bid and offer quotations to pther nondealers.

The broad dissemination of nondealer bids and offerings permits nondealers to compete directly with dealers. Suppose dealers are quoting a Treasury bill at discount rates of 6.46 percent bid and 6.44 percent offered. A nondealer wanting to buy the bill can take the 6.44 percent offering but can also bid on the bill at, say, 6.45 percent through the institutional execution system. In this case, his bid would improve upon the best dealer bid, so the nondealer becomes the best buyer in the market.

Although nondealers may not care to provide bid and offer quotations on a regular basis, there are occasions when they might find it in their self-interest to bid on an issue at a price below the best dealer

[15] A similar phenomenon was noted when NASDAQ was introduced into the over-the-counter equities market. Dealers who previously enjoyed an entrenched retail business found themselves faced with aggressive price competition from dealers lacking a similar traditional customer base.

offering price but above the best dealer bid. In the past, nondealers had no economically efficient way of advertising such bids. The institutional execution system gives them direct access to other investors and offers nondealers an added element of flexibility in completing their trades.

Conclusions

The introduction and development of electronic quotation systems during the past five years has led to fundamental changes in the Government securities market. The basis for these changes is the rapid, cheap, and widespread dissemination of bid and offer quotations.

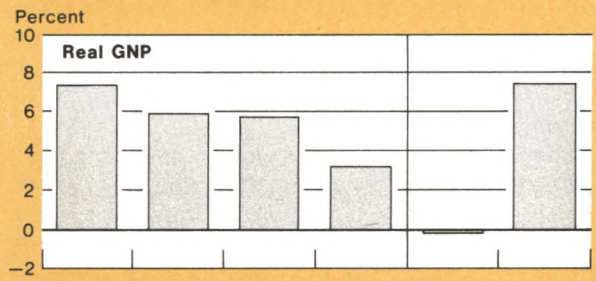
Electronic execution systems have transformed interdealer trading into a virtual auction process. These systems permit the disclosure of new bids and offerings in the interdealer market to all participants simultaneously. Moreover, they keep information on active trading opportunities before the dealers continuously. Traders at dealer firms are thus always informed of the prices at which they can make changes (of a conventional size) in their portfolio allocations. By increasing the uniformity of information available to different dealers, electronic execution systems have reduced the fragmentation of the interdealer market.

Billboard screens are beginning to have a similar effect on dealer-customer trading in conventional-size blocks of active issues, although the transformation is not so complete as in the interdealer case because of the relatively recent introduction of the single operational billboard. It seems likely, however, as that system expands and rival systems appear, increasing numbers of customers will be able to locate, cheaply and quickly, those dealers quoting the best prices. This will reduce the costs previously borne by those customers who lacked complete information on all available purchase and sale interests. By facilitating the execution of sales at the highest bid (and purchases at the lowest offer) billboard systems, like execution systems, will contribute to the efficiency and integration of the Government securities market.

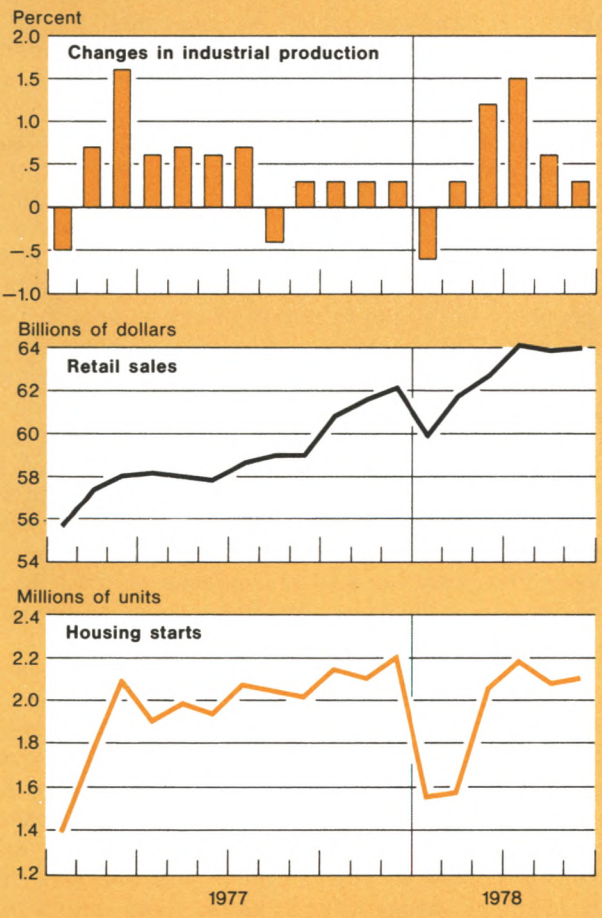
Kenneth D. Garbade

Chart 1

Reflecting the rebound from the depressed winter, economic activity rose strongly in the second quarter of 1978 . . .



. . . but the pace of growth slowed after the March-April spurt.



All data are seasonally adjusted. GNP is expressed as annual rates of change in 1972 dollars. Housing starts are expressed as annual rates.

Sources: United States Department of Commerce and Board of Governors of the Federal Reserve System.

The business situation

Current developments

The economic expansion settled down to a more moderate rate with the arrival of summer. After its heady rebound from the weather- and strike-plagued winter, the economy's return to a more sustainable pace of business activity was a welcome development. The recent slowing in growth, however, has not been accompanied by a lessening in the strong upward pressures on prices. The continued high rates of price increases are cause for serious concern. That inflation is now the nation's chief economic problem was underlined by the continued drop in unemployment—by mid-year the unemployment rate was at its lowest level in almost four years.

For the second quarter as a whole, consumer spending posted a sizable increase; however, after a spurt in April, the pace of spending leveled off (third panel of Chart 1). In fact, retail sales dipped slightly in May and, according to the advance report, were essentially flat in June. There was a leveling, too, in the sales of domestic automobiles, which plateaued at a near-record pace of 10 million cars over the April-June period. At the same time, imported car sales weakened a bit in June, although sales averaged a hefty 2.2 million rate in the second quarter.

The particularly high level of automobile sales in recent months has raised the question to what extent consumers may be buying in advance of higher prices. To the extent this is the case, current sales rates may reflect a borrowing from future months' sales. In any event, some slowing in the rapid growth of consumption in the past year is to be expected. The recent increases in consumer instalment credit and mortgage debt, which helped finance the step-up of consumer expenditures, may be approaching a level where households may question the prudence of expanding their debt burdens. In addition, consumer confidence has

been impaired in recent months by the high rates of inflation. Thus, while the exceptionally strong gains in employment over the first half of the year are raising personal incomes, it seems likely that consumer spending may not keep pace with the growth of disposable income.

Consumers' appetite for new homes remains strong, and sales of new single family homes are robust. In response to these demands, residential construction in the April-June period posted enormous gains from the depressed level of the first quarter. Despite some slippage in May, housing starts recovered in June and continue to run at better than a 2 million unit pace (bottom panel of Chart 1). Housing activity is widely expected to slow over the course of the year, partly in response to tightened credit conditions and slowing mortgage flows. Mortgage interest rates on conventionally financed new homes reached a record high of 9.46 percent in June, after jumping more than 35 basis points since the start of the year. While mortgage flows have slowed, Federal agencies have moved to support the growth of funds that undergird mortgage lending by introducing two new savings instruments. Preliminary evidence suggests that these instruments are augmenting deposit flows, although at this early stage it is difficult to assess their long-term effectiveness. (For more detailed discussion, see the article beginning on page 37.)

Responding to the strong spurt in consumption in March and April, businesses aggressively added to their inventory stocks. As the sales pace slowed, inventory investment moderated somewhat in May because of a sharp cutback in wholesalers' inventory accumulation. In fact, nondurable stocks at the wholesale level declined slightly in May. Outside wholesaling, nonfarm business inventories rose somewhat faster in May than in earlier months of the year. While inventory-sales ratios in retailing and manufacturing edged up, inventory levels appear overall to be reasonably well-balanced with sales, although stocks may be rather heavy in some retail lines.

Shaking off the effects of the severe winter weather, commercial construction activity rebounded in the second quarter, leading a step-up in businessmen's expenditures on capital investment. Signs of near-term strength are evident in a host of indicators. Production of business equipment has expanded sharply, and new orders for nondefense capital goods have been stepped up.

The longer term outlook for capital spending remains unclear, however. While the most recent surveys of planned plant and equipment spending point to a pickup in outlays, three available surveys offer disparate readings of the strengthening. The Commerce Department survey of April-May was especially disappointing, indicating an increase in spending of only 11.2 percent for the year, compared with last year's 12.7 percent rise. In contrast, surveys by McGraw-Hill and Merrill Lynch each point to a substantial rise in planned capital outlays of 15 or 17 percent. In historical terms, the Commerce Department survey has the best predictive performance of the three surveys, but the evidence of the two private surveys points to larger increases in capital spending.

Spending by state and local governments rose strongly in the second quarter. Payrolls expanded rapidly at the same time that construction activity accelerated with the coming of the spring thaw. Despite the strengthened fiscal position of state and local governments, the passage of Proposition 13 in California—which limits local property tax rates and makes it difficult to raise other state and local taxes—has raised questions about the outlook for continued growth of government demand. While cutbacks in California's state and local spending are unlikely to have significant impacts on the national economy, there could be wider ramifications as taxpayer revolts spread to other states.

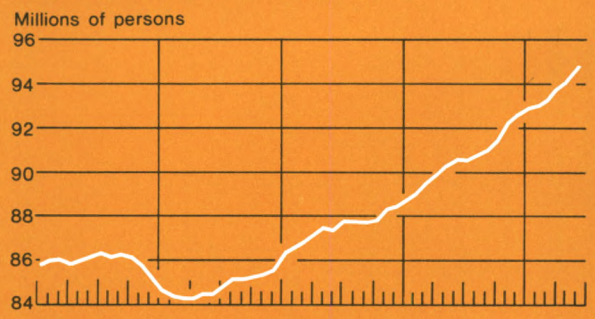
The labor markets continued to expand sharply in the second quarter. The growth of payroll employment accelerated to a 6.5 percent annual rate from the already rapid 4.4 percent rate of growth posted in the first quarter. Part of this acceleration in job growth is accounted for by the return of striking miners, but the underlying employment gains remain substantial. As the quarter progressed, however, payroll employment growth slackened a bit, and there was some evidence suggesting that the breadth of the employment expansion may be losing momentum. The strength of the United States Department of Labor's establishment survey, however, is corroborated by the separate survey of households. Total employment as measured by the household survey posted an increase of close to 1.2 million jobs in the second quarter, continuing the large gains of recent years (top panel of Chart 2).

In the closing month of the quarter, employment posted a huge increase of more than 700,000, with sizable job gains in the agricultural and nonagricultural sectors. The overall unemployment rate fell 0.4 percentage point to 5.7 percent in June, marking the first time since October 1974 that the rate of joblessness fell below 6 percent (bottom panel of Chart 2). About half the decline in unemployment was due to a drop in teenage unemployment. While there are always reasons to suspect a statistical aberration, the underlying strength of employment suggests at least part of the decline will persist.

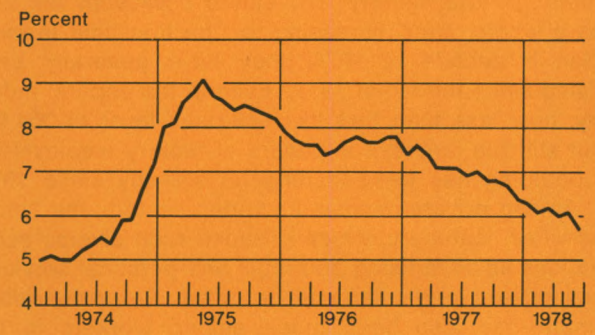
Although economic growth has begun to slow, the rate of inflation remains disturbingly high. Fanned by a

Chart 2

Continued rapid employment growth in the first half of 1978 . . .



. . . caused the unemployment rate to fall to its lowest level in almost four years.



All data are seasonally adjusted.

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

run-up in food prices, inflation has flared at both the consumer and the producer levels. Over the first six months of 1978, the overall consumer price index rose at an annual rate of 10.1 percent. In this period, food prices spurted at an annual rate of 17.6 percent, led by an enormous run-up in the price of meats. There is reason to hope that the rate of food inflation will moderate in the second half of this year, but it seems less likely that the slowdown can match that of 1977. A year ago the surge in food prices was led by coffee, and the price of this commodity fell sharply in the second half of the year, as did major grain prices in the face of record harvests. This year the price increases have been concentrated in meats, led by sharply rising cattle prices. Because of the long period of time required to increase the size of the cattle herd, beef supplies are unlikely to expand before 1980 or even 1981. Any increases in alternative meats—pork and poultry—will have to be unusually large to offset the expected decline in beef supplies.

Even if food price advances moderate later in the year, pressures on nonfood prices are likely to persist. Prices of services have accelerated sharply through the first six months of this year, rising at an annual rate of 10.2 percent since the close of 1977. Producer prices for nonfood finished goods, led by run-ups in durables prices, have spiraled at an 8.0 percent annual rate over the first half of 1978. These price increases will exacerbate the pressures on consumer inflation.

The recent price deterioration will also have an unwelcome side effect on wage costs. The wages of more than 8.5 million workers under major collective bargaining contracts contain automatic cost-of-living agreements (COLAs). In addition to these direct effects, nonunion wages and wages in union contracts without COLAs are likely to respond to the acceleration in price inflation. Indeed, even prior to the recent bulge in prices some acceleration in wages was apparent. Average hourly earnings in the private nonfarm economy, adjusted for shifts in the interindustry composition of employment, rose 8.2 percent over the twelve months ended June 1978, compared with a 7.2 percent increase over the previous twelve-month period.

The New York City economy: is the worst finally over?

New York City's economy is improving. The large contractions in employment, which exceeded 85,000 annually between 1969 and 1976, have been replaced by stability and even expansion in some industries during recent months. Other measures also suggest that the unremitting decline in business activity is ending. The contrast with earlier years is particularly evident in the commercial rental market. Hotel occupancy rates exceed earlier peak levels, and the once-pervasive overabundance of office space has disappeared. New construction and large-scale renovation work have revived the long-dormant building trades. Also on the positive side, inflation in the New York region has been less severe than in the rest of the nation.

Admittedly, this turnaround has by no means overcome the legacy of the previous decline. The city's physical plant continues to deteriorate, unemployment remains high, and the exodus of business persists. New Yorkers still suffer from high costs of living and burdensome taxes. Moreover, parts of the city continue to be plagued by a heavy incidence of crime and poverty. Nevertheless, New York City's long downward slide has at least been arrested.

Labor market conditions

Labor market conditions in New York City have improved noticeably. The decline in payroll employment, which began in 1969 and was largely unaffected by the two intervening periods of national recovery, now has halted. While private employment began to level off in 1976, a reduction in government jobs at the Federal and local levels caused total employment to decrease further. By the latter half of 1977, however, the contraction came to an end as both private and public employment stabilized (Chart 1).

Especially notable is the upturn in manufacturing. Although total factory jobs edged downward for 1977 as a whole, after increasing for the first time in more than a decade in 1976, they have generally been rising since the fall of 1977.[1] Even in the apparel industry, now less than half its 1948-peak level of 354,000 but still the largest component of factory employment, jobholding has been inching up steadily since 1976.

Among private nonmanufacturing sectors, the "other services" category, which includes such diverse occupations as advertising and legal and personal services, has posted particularly large gains. Progress—albeit small—has also been made among workers in the severely depressed building trades. Construction employment was little changed during 1977 but has shown some growth thus far in 1978, in large part due to increased activity in commercial building. A further pickup is likely because recent actions by various levels of government have greatly increased the probability that such large construction projects as an interstate highway (Westway), a convention center, and the Battery Park City housing complex will be undertaken.

In the remaining private sector industries, however, jobholding has not risen. Employment within the city's financial sector has been fairly constant, but jobs in transportation and public utilities have decreased further as have those in wholesale and retail trade. These weak spots notwithstanding, private employment in New York City appears to be breaking its long cycle of uninterrupted decline. In most major employment sectors, jobholding for the first six months of 1978 was somewhat greater than in the comparable period a year earlier (Table 1).

[1] Factory jobs in New York City currently account for little more than half their 1947 peak of 1,038,900. Nevertheless, this sector is still almost one fifth of total private employment.

Total public employment in New York City has also increased. While Federal Government jobs in the city have been contracting steadily and the number of state jobs has been relatively unchanged, local employment has risen as a result of Federally funded programs. Money received from the Comprehensive Employment and Training Act (CETA) is currently being used to fund almost 30,000 local government jobs out of a total of about 367,000. Other than these CETA jobs, local government employment has been shrinking. In addition to the approximately 77,000 positions which were eliminated during the 1975-77 period, the city administration has promised 3,000 further reductions by June 1979. Moreover, as outlined in the city's latest four-year financial plan, these are only the first cutbacks of an estimated total of 20,000 jobs to be eliminated by June 1982. Thus, the apparent contradiction between these well-publicized layoffs and the rise in public employment indicated in Table 1 is due to the CETA employment program.

Unemployment

The expansion of jobs in New York City has decreased unemployment among city residents. Over the first half of 1978, the city's unemployment rate averaged 9.1 percent, a 0.6 percentage point decline from the rate posted in the same period a year earlier (Chart 2). This decrease is sizable, but the problem of joblessness is still more severe in the city than it is nationally. While unemployment persists at all age levels, the differences between racial groups are not so great locally as elsewhere. During 1977, the ratio of the nonwhite to the white unemployment rate was lower in New York City than in the nation. Moreover, among nonwhite adult women the jobless rate was 7.9 percent in the city, compared with 11.7 percent nationally.

It is also noteworthy that New York City's labor force, which had been contracting since 1970, has been comparatively unchanged of late. Thus, the lower unemployment rate is attributable to a rise in employment. In the past, such reductions were generally due to the shrinkage in the labor force exceeding the drop in employment.

Business activity

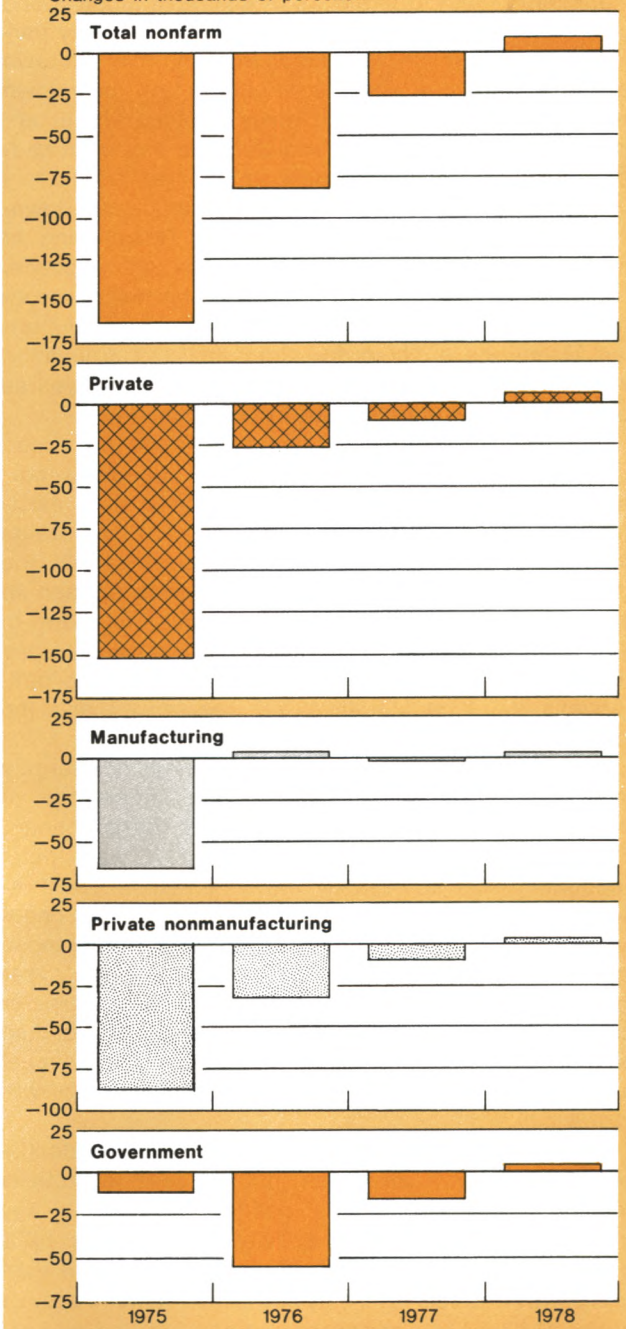
This strengthening in the labor market is, of course, a reflection of the upturn in business activity. One of the most dramatic improvements has been in the commercial rental market, where there has been a turnaround in the demand for both office space and hotel lodging. The simultaneous recovery of these two markets adds to the opportunity for widespread, well-balanced growth.

In the office rental market, the glut of excess capac-

Chart 1

New York City employment has begun to rise.

Changes in thousands of persons



The 1978 estimate is the average of six months' data seasonally adjusted by the Federal Reserve Bank of New York.

Source: New York State Department of Labor.

ity which existed a few years ago has disappeared. According to one recent study, total available office space in July 1978 was 16.6 million square feet, slightly more than half the inventory that was available in January 1973. Large blocks of desirable office space have become scarce, causing rents to rise sharply particularly in midtown locations. In turn, this midtown revival has had a positive effect on the downtown rental market. As the various costs involved with establishing, relocating, or even remaining at a current midtown location increased significantly or as adequately sized accommodations were no longer available, downtown activity also began to pick up. Responding to the heightened demand for additional office space, some new buildings are planned by such major corporations as International Business Machines and American Telephone & Telegraph Company and renovation work is scheduled for the Chrysler Building as well as for several other midtown and downtown sites.

Part of the impetus for this turnaround has been provided by the increased needs of domestic corporations that want to change or enlarge their existing facilities and by the continuing influx of foreign companies, especially in financial industries. Of the fifty foreign bank agencies and branches opened in the United States during 1977, twenty-four were in New York City. In addition, there has also been some shrinkage in available space as a result of the conversions of office buildings into residences and the demolition of older, less desirable structures.

The burst of activity in the hotel industry largely reflects the continuing and growing importance of New York City as a convention and tourist center. With the exception of the summer of 1976 when hotel occupancy was spurred by the Bicentennial Celebration and the Democratic National Convention, occupancy rates during 1977 were consistently above those in 1976 and in the first months of the current year have surpassed those of 1977. While several older hotels have closed in recent years, both new building and extensive remodeling are being undertaken to meet present demand and in anticipation of further growth in the city's tourist trade.

Along with commercial construction, the residential sector has shown an uptick, but the level of activity remains weak. Residential building permits—a key indicator of new housing activity—rose during 1977, but the 7,600 units authorized, while 2,200 more than in the previous year, still only approximate the low levels of the 1930's. They represent just one fifth the number of authorizations issued in 1972. During the first five months of 1978 the number of building permits issued has continued to rise slowly, with most of the increase concentrated in Manhattan (Table 2).

Table 1

New York City Nonagricultural Employment

Not seasonally adjusted; thousands of persons

Sector	Average employment January-June 1978	Average employment January-June 1977	Change from 1977 to 1978
Manufacturing	539.1	536.3	2.8
Private nonmanufacturing	2,131.1	2,128.4	2.7
Construction	65.5	63.1	2.4
Finance, insurance and real estate	414.2	413.1	1.1
Wholesale and retail trade	614.5	619.2	—4.7
Transportation and public utilities	255.0	259.8	—4.8
Services	780.6	771.8	8.8
Total private	2,670.2	2,664.7	5.5
Government	501.6	492.3	9.3
Federal	83.5	84.4	—0.9
State	51.0	49.3	1.7
Local	367.0	358.5	8.5
Total nonagricultural	3,171.8	3,157.0	14.8

Because of rounding, figures may not add to totals.

Source: New York State Department of Labor.

Table 2

New Housing Units Based on Building Permits Issued

Total of five months of data for each year; not seasonally adjusted

Area	1975	1976	1977	1978
The Bronx	253	158	823	284
Brooklyn	354	252	172	95
Manhattan	169	742	1,216	2,797
Queens	434	340	230	503
Staten Island	362	931	939	841
Total New York City	1,572	2,423	3,380	4,520

Source: New York State Division of Housing and Community Renewal.

There has been, however, one area of significantly growing activity within the residential sector. An increasing number of commercial properties are being converted to residential usage. This trend, which began with lofts, has spread to larger projects.

The tourist industry has been a major factor in fueling New York City's current revival. Broadway theaters are having a record season, and special museum shows are attracting ever-larger crowds. According to the New York Convention and Visitors Bureau, approximately 16.8 million people visited New York City during 1977, spending an estimated $1.6 billion. Compared with 1975, this is an increase of 750,000 visitors spending an extra $225 million. In recognition of the growing value placed on the tourist trade, the city restored in fiscal 1978 the 1974-75 pre-fiscal-crisis level of funding to the Bureau. Expanded and more aggressive advertising and marketing techniques, together with New York's other well-known attractions and the proposed new convention center now in the planning stage, seem to ensure the continuance of the tourist trade as a major growth industry in New York City.

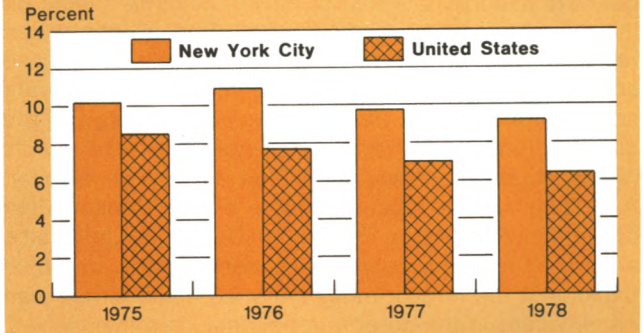
Little of a definitive nature can be said about the trend in local retail sales activity because the data are fragmentary.[2] It appears, however, that sales in the city followed the same overall pattern as elsewhere. A strong holiday season was followed by weakened sales in January and February. This sluggishness may have largely reflected the disruptive effects of severe snowstorms, since buying has generally rebounded with the warm weather. Although several general merchandise establishments have closed, other stores report that they are reaping the gains from large-scale renovations, innovative marketing, stepped-up promotional campaigns, and Sunday store openings, as well as from the fledgling upturn in the city economy.

Prices and the cost of living

The city's competitive position has also improved. While the level of consumer prices remains higher in New York than in the nation as a whole, the difference has been narrowing as the inflation rate in the New York-Northeastern New Jersey region has been more moderate than that in the rest of the country. For the twelve months ended in June 1978, consumer prices rose 7.4 percent nationally but only 5.5 percent locally. During 1977, the rise in each of the major components of the consumer price index—food, nonfood commodities, and services—was less in New York than in the nation. Price increases in the New York region have also been less severe than those in other major metropolitan areas and so these gaps, too, are slowly being reduced (Table 3). To be sure, New York has not been immune from the recent pickup in nationwide inflation rates, but local price increases have been less severe than nationally in a continuation of a pattern which began in 1974.

Chart 2

The unemployment rate in New York City remains high.



The unemployment rate is the average of six months' data, not seasonally adjusted.

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

Although price differences as measured by the consumer price index have decreased, the total cost of living still is comparatively high in New York City, according to the latest estimates prepared by the Bureau of Labor Statistics. In the autumn of 1977, for an urban family of four at an intermediate budget level, the New York-Northeastern New Jersey area was estimated to be one of the most expensive metropolitan areas in the United States in which to live, exceeded only by Anchorage, Honolulu, and Boston. This survey found that the differential in intermediate-level living costs between New York and the average of all other metropolitan areas remained the same between 1976 and 1977—about 14 percent. At the higher budget level the gap in living costs rose by 1 percentage point to 22 percent, but at the lower level the differential narrowed from 6 percent to 5 percent.

Corporate headquarters

Despite the many changes that have occurred in New York City's economy, the well-publicized emigration of both industrial and nonindustrial companies continued during 1977, although at a somewhat slower pace than in the past. Two more of the nation's 500 largest industrial companies joined the exodus, reducing the total number remaining in New York to 82.

[2] Due to sample revisions, retail sales data are available on a consistent basis beginning only in August 1977.

While this is far fewer than the 140 companies which were headquartered in the city in 1956, the relative decline has been in line with that in other older urban areas (Table 4). The exodus of corporate headquarters has the potential of having adverse effects on the city economy beyond the direct loss of jobs or tax revenues due to the relocations themselves. If these companies sever their link with the city's corporate service firms as well as discontinue their usage of the city's cultural and entertainment resources, the effects of the original loss are multiplied several times over. According to one recent estimate by the Conservation of Human Resources Project at Columbia University, employment in the corporate service sector, of which banking is the largest industry, is 2.3 times larger than employment in the corporate headquarters themselves. The same study found, however, that firms which relocate to the suburbs of the city generally tend to maintain these links. Of the Fortune 500 companies that have left the city, approximately two thirds have remained in the tristate region.

The corporate relocation movement has not all been in one direction. Some companies that were considering moving have decided to stay in New York, while some others that had left are now returning—including some smaller companies as well as Fortune 500 firms. In addition, the influx of foreign companies continues strong. These enterprises absorb large amounts of commercial space and employ many New Yorkers. Indeed, in a survey of Japanese firms in New York City, it was found that, for every Japanese worker that they brought here, 2.1 local residents were employed. Such companies as these, spread out among all sectors of the economy, help support the high concentration of business and ancillary services for which New York is known.

The city's Office of Economic Development (OED) has taken steps to reverse the outflow of businesses from New York. By arranging for some local firms to receive tax abatements and for others to be able to issue tax-exempt industrial development bonds, by assisting firms which are hurt by foreign import competition to obtain Federal aid, and by reducing the time consumed on local licensing and administrative procedures, OED has helped some local companies to maintain or expand their facilities in the city. OED also contracts on-the-job training programs and provides energy counseling to individual businesses.

Government help

The economic problems of New York have created a new awareness within government of its role in fostering the revitalization of the city's economy. The three levels of government have each in different ways directly participated in the efforts to reverse the downward trend in local business activity. In addition to the programs of the OED and reductions in the local business tax burden through both lowering rates and

Table 3

Consumer Prices and the Cost of Living in Selected Metropolitan Areas

Area	Annual change in consumer price index, 1973 to 1977 (in percent)	Annual family budget, autumn 1977 (in dollars)
New York-Northeastern New Jersey	7.3	19,972
Boston	8.1	20,609
Chicago-Northwestern Indiana	7.4	17,330
Detroit	7.6	17,427
Los Angeles-Long Beach	8.6	17,126
Philadelphia-New Jersey	7.9	17,792
Washington D.C.-Maryland-Virginia	8.0	18,026

Price changes calculated at a compound annual rate; costs estimated for a four-person family at an intermediate budget level.

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

Table 4

Fortune 500 Companies in Major Cities

1956 and 1977

City	1956	1977	Change
New York	140	82	− 58
Chicago	47	24	− 23
Pittsburgh	22	14	− 8
Detroit	18	5	− 13
Cleveland	16	13	− 3
Philadelphia	14	7	− 7
St. Louis	11	13	+ 2
Los Angeles	10	12	+ 2
San Francisco	8	6	− 2
Boston	7	4	− 3
Total	293	180	−113

The ten cities are those which had the greatest number of headquarters in 1956, the first year in which this survey was taken.

Source: "The Fortune Directory of the 500 Largest U.S. Industrial Corporations", *Fortune* (July 1957 and May 1978).

granting tax credits, the city has adopted a policy of working with the business community rather than continuing its past pattern of developing programs and taking actions which too often proved to be counterproductive to private enterprise and therefore to the city's economy.

New York State has also attempted to help the city through the pursuit of policies which encourage economic growth. Tax incentive and loan programs and several amendments to state regulations governing the insurance and banking industries are examples of such endeavors. A reinsurance exchange and a "free trade" zone for large nonconsumer insurance contracts will begin operating within the next few months. A bill exempting international banking activities from state and city taxes also has been passed by the Legislature and signed by the Governor. This legislation clears away tax obstacles to banks establishing international banking branches that would perform many of the activities now done through "shell" branches in the Bahamas and Cayman Islands, as well as other foreign branches. Establishment of such branches will require changes in Federal Reserve regulations, the implications of which are now under study. In addition, the state's improved financial picture has led to reductions in both the business and personal tax burden. This in turn may help to make New York City, along with the rest of the State, more competitive with neighboring states.

The Federal Government, too, has taken the initiative in developing programs designed to bolster New York City's economy either directly or in conjunction with that of other cities. The President's proposed urban aid package and legislation targeted at specific problems such as mass transit, housing, or unemployment are examples of programs which aim to help New York City, along with other urban centers.

Of the efforts especially planned to assist New York City, one of the most prominent is the Federal Government's commitment to aid the South Bronx. The city is scheduled to receive $55.6 million in Federal dollars by September 30, 1978, which will be used primarily to increase job opportunities among the area's hard-core unemployed and to restore two major commercial districts. Within the next five to seven years, the city expects Federal contributions to the rehabilitation of the Bronx to total $520 million, of which $200 million will be used for housing subsidies.

As a further spur to the city's economy, the Federal Department of Housing and Urban Development has tentatively agreed to provide a maximum of $68.5 million in mortgage insurance for the first six buildings at the Battery Park City housing project. This backing will be contingent upon the project's meeting numerous conditions outlined by the Federal Government. Work on the buildings halted in 1975 when fiscal difficulties prevented the state's Battery Park City Authority from selling the bonds necessary to finance construction.

The future

The durability of New York City's turnaround is by no means assured. The city's underlying problems can only be resolved over an extended period of time and with ongoing assistance from all levels of government. Meanwhile, such burdens as high costs of living and of doing business will tend to impede the city's longer term recovery. In the near term, the course of the national economy will doubtless also affect the city's fortunes. The current economic expansion, well into its fourth year, is widely expected to slow down. Such an occurrence could pose a threat to the limited recovery thus far exhibited by the city. In addition, the city's own fiscal situation will be an important determinant of its future economic well-being. New York City's new four-year financial plan is intended to enable the city to meet its short- and long-term financing needs, while it proceeds to balance its budget according to generally accepted accounting principles and gradually to regain access to the credit market. A number of steps have been taken during the past few months toward those objectives. Labor negotiations with more than 200,000 municipal workers were completed; the Congress has agreed upon a loan guarantee bill; the life of the fiscal monitoring agent has been extended on a long-term basis; and authorization for additional borrowing by the Municipal Assistance Corporation has been obtained. Yet these accomplishments, while important, represent only temporary solutions. If New York's economic future is to be secure, the city must continue to attack its underlying economic problems and finally resolve its fiscal problems in a way that enables it to function without special Federal financial aid.

Rona B. Stein

Tax policy: its impact on investment incentives

The sluggish growth of business investment has been a disappointing feature of the current recovery. This situation has caused widespread concern. Vigorous business investment is important not only to maintain the momentum of the recovery but also to increase the productive capacity of the economy.

Some have argued that the tax system coupled with inflation creates disincentives to invest in capital goods such as plant and equipment. Others have said that businessmen regard the outlook as uncertain and are reluctant to invest for this reason. While there may not be agreement on the precise causes of the slow growth of investment spending, most experts agree that certain types of tax change would act as a spur to business purchases of equipment, plant, and offices. This article discusses four types of tax change. They include a reduction in the corporate tax rate and an increase in the investment tax credit, both part of the Administration's proposed tax reduction package; a shortening of the service lives that businesses may use to depreciate capital; and a reduction in the taxation of capital gains (box on definitions).

Tax policy: a brief history

These four tax provisions have undergone many changes over time. In the majority of cases, the change has lowered taxes. Since World War II, for example, the four structural features of taxation examined here have been altered about twenty times, with Treasury revenues being raised in less than half the cases. The few occasions when business taxes were raised almost always coincided with periods of war.

The corporate tax rate has been changed frequently to stimulate or to restrain economic activity. The rate was lowered immediately after World War II, in part as an attempt to head off an expected recession. Then, during the Korean war the corporate tax rate was raised to finance the increased defense expenditures and to reduce inflationary pressures. In addition, an excess profits tax, which effectively raised the corporate tax rate, was levied from 1950 through mid-1953. The next changes occurred in 1964 and 1965 when the rate was lowered in two steps as part of the Revenue Act of 1964, aimed at stimulating economic growth. The subsequent buildup of inflationary pressures in the middle and late 1960's led to the imposition in 1968 of a 10 percent tax surcharge which effectively raised the corporate tax rate. This surcharge expired in 1970. In 1975, the tax rate on the first $50,000 of corporate taxable income was reduced to help push the economy out of recession.

The investment tax credit is a relatively new device, first introduced in 1962. It has been applied almost exclusively to expenditures on machinery and equipment. The tax credit cannot be applied to investment in structures, except for research and certain storage or special purpose facilities. Purchases of up to $100,000 of used machinery and equipment can qualify for the credit. The credit was established at a rate of 7 percent. Public utilities, however, were permitted to claim a tax credit of only 3 percent. (This was raised to 4 percent in 1971.)

Initially, the tax credit had to be deducted from the purchase price of the asset to arrive at a basis for the calculation of depreciation allowances. This feature, known as the "Long Amendment", reduced the credit's effectiveness and apparently also complicated taxpayers' bookkeeping practices. Because of these reasons, in 1964 the deductibility requirement was eliminated. The investment credit was temporarily removed twice in the past ten years, from October 1966 to March 1967 and from April 1969 to August 1971, to

help combat inflation. In 1975 as part of the anti-recessionary fiscal program, the credit, including that for public utilities, was raised to 10 percent. It is scheduled to revert to 7 percent in 1981, with the exception of utilities for which the credit is scheduled to revert to 4 percent.

The investment tax credit has always been subject to certain restrictions. To encourage long-term investment, the 10 percent credit is available only for equipment with at least a seven-year service life, *i.e.,* the period of time over which a capital asset is depreciated. Investment in equipment with a service life of three to four years is eligible for one third of the full investment tax credit; a service life of five to six years, for two thirds of the full credit.

A practical limitation is that there must be a sufficiently large tax liability for the investment tax credit to offset. For most industries, the credit can be used to offset the first $25,000 of tax liability and then only 50 percent of the liability above $25,000. Utilities, railroads, and airlines are permitted temporarily to use the credit to offset a larger percentage of tax liability. Excess credits, the amount of credit which exceeds the allowable tax offset, can be applied to tax liability three years back or seven years into the future.

The allowable deduction for depreciation, *i.e.,* for wear and tear of equipment and structures, has been changed several times to provide additional investment incentives. The original provision for the calculation of depreciation allowances specified only the use of the straight-line method. In 1954, accelerated methods of calculating depreciation allowances, the declining-balance and sum-of-years-digits methods, were authorized.[1] Since then, these and the straight-line method have been the standard methods of calculating depreciation allowances (box on page 32).[2]

Further liberalization of the depreciation allowances deduction has been accomplished through the shortening of the suggested service lives of capital assets. Suggested service lives to be used in the calculations were first provided in 1942, with the publication of Bulletin F. During World War II and the Korean war, a five-year amortization was made available for investment in defense facilities. (The second episode of the fast amortization continued until 1959.) The first general shortening of suggested service lives occurred in 1962 when the Internal Revenue Service (IRS) authorized a new set of guideline service lives for broad classes of assets. Suggested service lives for equipment were reduced by 30 to 40 percent from the former guidelines; service lives of structures were not changed significantly.[3] Additional shortening of service lives was permitted in 1971 under the "asset depreciation range" system, which permitted firms to use service lives for machinery and equipment that differed by 20 percent from the 1962 guidelines. Moreover, since 1969 a five-year write-off period has been available to certain investments deemed to have high social priority. However, it applies to only a small fraction of total investment and, in almost all cases, the investment tax credit by law cannot be applied to those investments which are depreciated over this special five-year

Definitions

Corporate tax rate. The tax rate that corporations apply to taxable income for determining tax liability, before adjustment for foreign tax credit, investment tax credit, or employment tax credit.

Investment tax credit. The proportion of the cost of a capital good that can be used directly to reduce tax liability.

Depreciation allowances. The deduction for wear and tear and obsolescence of capital goods and structures in cases where the estimated useful life of the item exceeds one year. The annual depreciation deduction depends on:

(a) the purchase price of the capital good;
(b) the service life of a capital good: the number of years over which the capital good will be productive;
(c) the salvage value of the capital good at the end of its service life;
(d) the method of depreciation: the three standard methods are straight-line, declining-balance, and sum-of-years-digits.

Capital gains tax. The tax that is levied on the increase in the value of an asset if the asset is held over a span of time at least as long as the minimum time required by law. The tax is not incurred until the asset is sold and the increased value is realized.

[1] There are several other principal depreciation methods, but they are used mainly for special types of capital goods or in particular cases. Alternatively, any other consistent depreciation method can be used so long as it does not generate more depreciation deductions than the declining-balance method during the first two thirds of the service life of the capital good.

[2] New residential buildings are permitted to be depreciated at a rate of up to 200 percent of the straight-line rate (the double declining-balance method) or by the sum-of-years-digits method. Nonresidential buildings can be depreciated at 150 percent of the straight-line rate, and used residential buildings at 125 percent of the straight-line rate. Depreciation of used nonresidential buildings is restricted to the straight-line method.

[3] A.H. Young, "Alternative Estimates of Corporate Depreciation and Profits: Part 1", *Survey of Current Business* (April 1968).

Methods of Calculating Depreciation Allowances

Three standard methods of calculating depreciation allowances are widely used. They are straight-line, declining-balance, and sum-of-years-digits. The table shows the patterns of depreciation allowances produced by these three methods for an asset worth $1,000 with a service life of ten years and a salvage value of zero.

The straight-line method distributes the value of the asset evenly across its service life. In the current example, the annual depreciation allowances equal 10 percent of the asset's value, or $100.

The declining-balance method applies a particular depreciation rate to the undepreciated value of an asset remaining each year. For instance, the double declining-balance method applies twice the straight-line rate to the undepreciated value. In the example, the double declining-balance applies a rate of 20 percent to $1,000, in the first year ($200), then 20 percent to $800 in the second year ($160), etc. A taxpayer using the declining-balance method has the option of switching to straight-line in any year. In the present example, this becomes profitable to do in the seventh year of the service life. Under the asset depreciation range system, a taxpayer also has the option to switch from the declining-balance method to the sum-of-years-digits method. This is profitable to do in the second year of the service life.

The sum-of-years-digits method determines the depreciation rate as the ratio of the service years remaining to the sum of the numbers from one to S, the service life. In the current example, the sum of the numbers from 1 to 10 equals 55. Hence, in the first year the depreciation rate is 10/55, in the second year 9/55, in the third year 8/55, etc.

It is apparent from the table that the declining-balance and the sum-of-years-digits methods involve larger depreciation allowances early in the life of the capital good. Compared with straight-line, the two accelerated methods yield higher depreciation allowances over the first 40 or 50 percent of the service life and lower allowances thereafter. This is reflected by the present values of the depreciation allowances associated with the two accelerated methods exceeding that of straight-line depreciation.

Three Methods of Depreciation for a Ten-Year, $1,000 Asset

In dollars

	Depreciation method		
Year	Straight-line	Double declining-balance	Sum-of-years-digits
1	100	200	182
2	100	160	164
3	100	128	145
4	100	102	127
5	100	82	109
6	100	66	91
7	100	65.5	73
8	100	65.5	55
9	100	65.5	36
10	100	65.5	18
Total	1,000	1,000	1,000
Present value of depreciation allowances using a discount rate of 8 percent	671	733	748

Source: J. Pechman, *Federal Tax Policy* (Third Edition, The Brookings Institution, 1977).

period.[4] Taxpayers are permitted to specify service lives shorter than those suggested by the IRS if adequate justification is shown.

Long-term capital gains have been treated differently from ordinary income since the early years of the Federal income tax. For most of the postwar period—up until the end of 1976—long-term gains were defined as gains on assets held more than six months. Until 1969, a taxpayer, whether an individual or a corporation, could choose between two methods of computing the tax on realized long-term capital gains. One method was to include half (all, for corporations) of these gains in taxable income; for an individual, this was equivalent to a tax rate on the total gains equal to 50 percent of the marginal rate. The other method was to apply an "alternative" tax rate of 25 percent to *total* realized long-term capital gains.

The Tax Reform Act of 1969 made several changes which effectively raised the marginal tax rate on large realized long-term capital gains. For one thing, the alternative tax rate was raised to 30 percent for corporations. Second, for individuals, the alternative tax rate

[4] The Administration proposes to extend the entire investment tax credit to pollution-control equipment, regardless of the five-year amortization period for which this equipment is eligible.

was restricted to the first $50,000 of realized long-term capital gains; half of any realized long-term capital gains in excess of $50,000 was treated as ordinary income. Third, for individuals with large amounts of income subject to preferential taxation, a minimum tax was applied to the preferentially taxed income;[5] half of the realized long-term capital gains in excess of $50,000 was regarded as preferential income for these computations. Finally, individuals with earnings which were being taxed at the maximum earnings tax rate of 50 percent would have to apply higher marginal tax rates on some of those earnings to the extent that their preference incomes were greater than $30,000.

The most recent changes in the taxation of capital gains were made in the Tax Reform Act of 1976. The holding period defining a long-term capital gain was lengthened to nine months for gains realized in 1977 and to twelve months thereafter. In addition, the minimum tax on preference income was raised and the $30,000 exemption was eliminated from the preference offset to the maximum tax.

Last January, the Administration proposed a package of business tax changes. The major components of the package were as follows. The corporate tax rate would be reduced from 20 percent to 18 percent on the first $25,000 of corporate income, from 22 percent to 20 percent on the second $25,000, and from 48 percent to 45 percent on income over $50,000. (Effective January 1, 1980, the maximum corporate rate would be reduced to 44 percent.) In addition, the investment tax credit would be extended to utility and industrial structures and to certain pollution-abatement facilities and made permanent at the current 10 percent rate. The credit would be allowed to offset up to 90 percent of the tax liability otherwise owed. (The investment tax credit liberalization would also apply to individual income taxes on business income.) However, the Administration also recommended that the use of accelerated depreciation methods for real estate, with the exclusion of low-income and new multifamily housing, be prohibited and that businesses be required to use more realistic service lives in calculating the depreciation of buildings. The latter two proposals would tend to reduce the incentive to invest in structures, but they were introduced as ways to make the tax depreciation correspond more closely with the true economic depreciation. In addition, the Administration proposed to eliminate the alternative tax on capital gains and to increase the amount of preferential income that would be subject to the minimum tax. These proposals are now in a state of flux. The Administration has reduced the size of the proposed tax cut, and there is strong support in the Congress for a capital gains tax reduction.

Taxes: their impact on a firm's investment decision

Before discussing how various proposed tax changes affect a firm's decision to invest, it should be pointed out that the currently high inflation rate tends to raise the effective tax rate on income from capital and thus dampens the incentive to invest.[6] The effective tax rate rises in an inflationary setting primarily for two reasons: inventories increase in value because of higher prices, and the resultant gain is taxed as ordinary income; and depreciation allowances, being based on original book value, tend over time to understate true depreciation, and therefore their value as a tax deduction declines. Consequently, a tax cut is needed just to maintain the level of investment incentives. How, then, do different types of tax reduction actually affect a firm's decision to invest?

A reduction in the corporate tax rate increases a firm's aftertax earnings. It thereby raises the expected net aftertax return from an investment in corporate plant, equipment, or other useful capital goods. These new capital goods, together with labor, materials, etc., allow a firm to increase its output and sales. With a lower tax rate, a firm is permitted to keep a larger fraction of the profit from this new endeavor and thus is given an incentive to expand.

The investment tax credit, by reducing tax liability when a firm purchases an eligible investment good, effectively lowers the price of the new capital good by the same percentage as the credit. Firms probably regard the investment tax credit as more certain than the tax savings associated with a tax rate cut, because the entire tax credit is generally taken immediately whereas the total impact of a tax rate cut depends on future income.

There is, however, some restriction on the credit's use—there must be a sufficient tax liability against which the credit can be applied. But the impact of this restriction is not so great as might appear at first glance. For one thing, the credit may be applied against taxes paid in the three previous years. The major drawback of the carry-back feature is that it entails a great deal of complicated accounting. There is also a carry-forward provision which allows the credit to be saved for up to seven years. This is not so useful

[5] "Preferentially taxed" income includes, among other things, half of realized long-term capital gains excluded from taxable income, itemized deductions (other than those for medical expenses and casualty losses) in excess of 60 percent of adjusted gross income, and depletion deductions in excess of the amount that would be allowed on the basis of cost.

[6] See P.J. Corcoran, "Inflation, Taxes, and Corporate Investment Incentives", *Quarterly Review* (Autumn 1977), pages 1-10.

as the carry-back provision, because firms prefer to receive the tax credit earlier rather than later. A delay in receiving the credit precludes a firm's earlier use of the money and also introduces the possibility that the level of its taxes in the future, after deducting the tax credits for future new investment, will not be high enough to utilize the credit even then.

It is possible for firms to collaborate with each other to receive the full amount of the credit. For instance, a firm, which because of insufficient tax liability against which to apply the credit cannot immediately obtain the investment tax credit, can arrange to have the piece of equipment purchased by another firm that is in a position to obtain the tax credit. The equipment then can be leased at a special rental rate to the company that needs it. The extent to which the rental rate is set below the usual market rate on such equipment depends on the negotiated division of the tax credit between the two firms.

Of course, all the devices to use the credit when the current year's liability is insufficient involve some cost to firms. The Administration's proposal to raise the ceiling on the permissible tax offset to 90 percent is meant to reduce the need for firms to resort to these devices.

Unlike a cut in the corporate tax rate or an increase in the investment tax credit, the shortening of service lives for depreciation allowances does not constitute a reduction in the cumulative dollar amount of a firm's tax liability over the service life of a capital good. Instead, it changes the timing of the payment of tax liability, reducing the payment during the early years of service life and enlarging the payment during the later years. In effect, it represents an interest-free loan from the government. The value of different streams of depreciation allowances can be measured by scaling-down or "discounting" future depreciation and summing each year's discounted depreciation. (This sum is called the "present value".) Because it allows the depreciation to be taken earlier, a shortening of service lives raises for the firm the present value of the depreciation allowances associated with an investment.

So far, the tax provisions examined have applied directly to business. A reduction in the tax rate on realized long-term capital gains, in contrast, affects mostly individuals but can also influence a firm's decision to invest. Because the aftertax value of realized capital gains is increased, stock ownership is made more attractive to investors. Stock prices would be bid up, enabling corporations to obtain more new money per extra share issued and thus make the financing of new investment easier and less costly. This would be particularly true for newly started companies with good prospects.

The relative effectiveness of tax policies

It is apparent from the above discussion that the tax system can be used in a number of ways for the purpose of providing investment incentives. Which way is the most effective? Which kind of tax change has the greatest impact per dollar of revenue foregone—which gives the biggest "bang per buck"? Our discussion will concentrate on a corporate tax rate cut, an increase in the investment tax credit, and a service lives reduction for tax depreciation purposes. These three types of tax changes can easily be compared, because both their direct revenue effects and their incentive effects can be analyzed in similar ways.

In contrast, the evaluation of the incentive impacts of a capital gains tax change is too complex for precise calculations. The channel through which a capital gains tax cut affects the decision to invest is indirect, for it is investors of funds who are directly affected, and it is their valuation of and response to the tax cut, both of which are highly uncertain, that determines the extent to which firms would find financing easier and thus investment more attractive. However, a number of general statements can be made. The capital gains tax applies to many kinds of assets such as corporate stocks, houses, and land and to gains accrued over the past. Thus, a reduction in the gains tax would not flow entirely to new investment, which would tend to lessen the tax cut's incentive impact on businesses' decision to invest. On the other hand, new firms with bright prospects but little current income, which therefore would not benefit from the other types of tax cut, might benefit from a capital gains tax reduction. Such firms might find raising capital funds easier if their prospective capital gains were to be taxed at a lower rate.

For the other three types of tax cut, the comparison is based upon the degree of stimulus per dollar revenue loss provided by each change in tax policy. Of course, the extent to which firms respond to any of the three tax changes depends upon a number of things including the need to increase productive capacity, the degree of substitutability between capital and labor in the production process, and the degree of substitutability between domestic and foreign investment. These issues are beyond the scope of this article. In addition, if the tax cut were temporary, then firms might change the timing of their capital expenditures to take advantage of the tax savings. In particular, if the tax cuts were in the form of a temporarily higher investment tax credit or temporarily shortened service lives, there would be a short-run spurt in investment, which would be offset by lower than otherwise capital spending after the tax cut expired. The tax cuts in the present analysis are assumed to be permanent.

A comparison of a corporate tax rate cut, an increase in the investment tax credit, and a service lives reduction begins with the observation that all three lower government revenue and raise businesses' after-tax income. One factor in the comparison is whether a tax cut is directed at both old and new capital or only at capital accumulated after the tax change. Based upon this consideration, in the long run, when the entire capital stock is replaced, all three types of tax reduction would be essentially equivalent in terms of stimulating investment. In the short run, however, the corporate tax rate reduction benefits profits stemming from capital accumulated prior to the tax change as well as profits attributable to new investment in fixed capital. Hence, the old capital absorbs much of the tax cut, diverting it from new investment. With an increase in the investment tax credit and a service lives reduction, the tax cut is directed almost entirely at new capital at the outset. Consequently, in the near term these two types of business tax break provide more investment stimulus than a corporate tax rate cut per dollar of revenue given up by the government. These two tax cuts, however, differ in their timing. For this reason, they might differ in impact.

Can we tell which of these two types of tax cut is more effective? The effectiveness of a tax cut is measured by comparing its value to businesses with its cost to the United States Government. In the case of the investment tax credit, we assume for the sake of simplification that the entire impact is in the first year of the investment.[7] If, for example, $5 billion is used to give new investment tax credits, then businesses gain $5 billion worth of investment incentive and the Treasury loses $5 billion in revenue. The ratio—a measure of the stimulus per dollar lost—is therefore unity in the case of an investment tax credit increase.

In the case of a reduction in service lives that may be used for depreciation, there will be an alteration in a firm's taxes beginning in the current year and extending over the remainder of the life of the capital good. During the early years of the good's life, a business will pay lower taxes, while during the later years there will be less depreciation to take and tax payments will be higher. Although the *sum* of dollars lost by the government equals the sum of dollars gained by business, the *value* placed on the stream of tax payments may not be the same by the two parties. The value placed upon a stream of income depends upon the weight placed upon the future versus the present. If business places one weight on the future and the government places a different weight on it, then the *value* of a service lives reduction would be different for business than it is for the government. Thus the ratio of the value to business versus the value to the government of a service lives reduction could be different from unity—it could be bigger or smaller.

If the government and business weigh the future equally, the service lives reduction yields a present value of tax savings to business which is exactly equal to the present value of revenue loss to the government. (Present value is the term used to denote the value today of a future income stream, see page 34.) Thus, for this case the service lives reduction would have an effectiveness of unity and, hence, there would be no difference between the effectiveness of an increase in the investment tax credit or a service lives reduction (box on page 36).

Next, consider the case where businesses weigh the future less than the government. Then, businesses would value the additional tax payments late in the capital good's life from a service lives reduction less than government counts the additional tax revenues. Hence, the present value of firms' tax savings from a service lives reduction would be greater than the present value of tax losses to the government. An extreme example occurs where business discounts the future to some extent, but the government does not discount the future at all. Because a service lives reduction changes only the timing of tax payments, but not the cumulative amount, the present value of the revenue loss to the government in this case is zero. Businesses still would benefit from the service lives reduction, though, because the present value of their tax savings is greater than zero. Thus, when businesses weigh the future less than the government, the ratio of the present value of businesses' tax savings to the present value of the government's revenue loss is greater than unity. In such a case, shortening service lives is more effective than an increase in the investment tax credit.

The comparison is not so clear-cut when businesses weigh the future more than the government. Over a wide range of differences between the weights businesses and the government assign future income, businesses would value the higher future tax payments more than the government would value future additional tax receipts. In other words, the present value of the tax savings to businesses from a service lives reduction would be smaller than the present value of tax revenue loss to the government, and the measure of effectiveness would be smaller than unity. In this case, a service lives reduction would be less effective than an increase in the investment tax credit.

When the government, however, assigns exceptionally little weight to future income, compared with business, then the government would discount by more than

[7] The following results would be modified only slightly if firms had to "carry forward" the tax credit or "share" it with another firm.

businesses not only the higher future tax receipts but also the lower tax receipts in the near to medium term. This could cause the present value of tax payments to businesses to be above the present value of tax revenue loss to the government. Such a result could occur, for instance, when the government is concerned only about the revenue loss in the first year of the tax cut. Thus, in such extreme cases when businesses value future income extraordinarily more than the government, a service lives reduction could be relatively more effective than an increase in the investment tax credit.

There is no way of determining whether business or the government weighs the future more. Some considerations suggest that businesses may regard the future as more uncertain and discount it more than the government. For example, the range of profit variation for a single firm is larger than the average profit variability in the economy as a whole. This suggests that the firm would be more uncertain about its income than the government whose revenue is based in part upon total profits in the economy. However, taking other factors into account, the government may actually weigh the future less than business does. The state of the economy and political considerations are two factors that might figure in the government's emphasizing the present versus the future. On balance, however, it seems reasonable to conclude that the government and businesses, reflecting society's judgments, view the future similarly. Consequently, in most circumstances a service lives reduction and an increase in the investment tax credit are equally effective and efficient in providing additional investment incentives.

Relative Effectiveness of an Increase in the Investment Tax Credit and a Shortening of Service Lives for Depreciation Calculations

Businesses weigh the future less than does government	Businesses and government assign the same weight to the future	Businesses weigh the future more than does government
Shortening of service lives is more effective in providing investment incentives	Shortening of service lives and increase in investment tax credit are equally effective in providing investment incentives	In most cases, increase in investment tax credit is more effective in providing investment incentives. In extreme cases, shortening of service lives may be more effective in providing investment incentives.

Conclusion

Tax policy has many purposes. Besides the obvious one of raising revenue, taxation affects the distribution of income, the allocation of resources, and the amount and composition of spending. For example, a corporate tax rate cut can provide added incentives to a wide range of business activities, not just to those which rely heavily on fixed capital. An investment tax credit increase and a service lives reduction, on the other hand, benefit almost entirely new fixed capital. As a result, these two tax changes may be more favorable to certain industries and regions. In deciding on tax changes, all these factors must be taken into account.

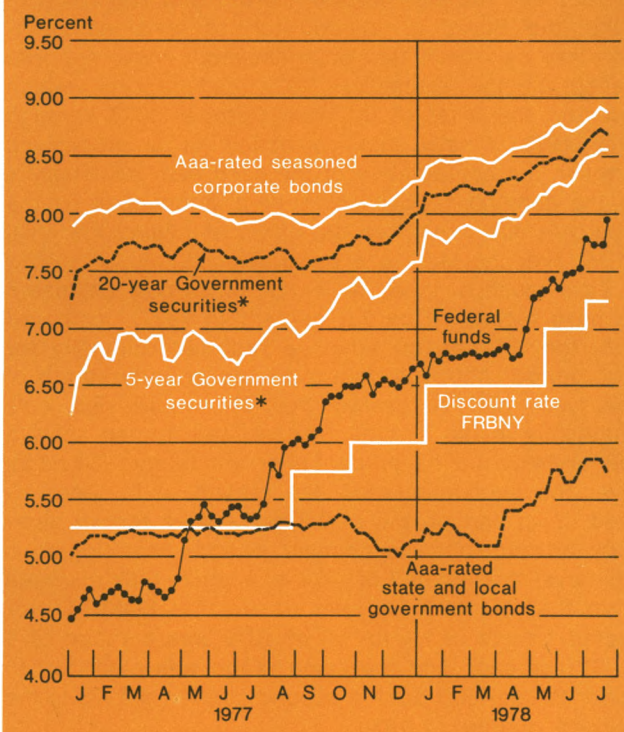
The analysis presented here focused on only one objective, the desire to spur business investment. From this vantage point, a capital gains tax reduction is likely to have a favorable impact on businesses' decisions to invest, but the channel through which this occurs is largely indirect and highly uncertain. Three other types of tax reduction were examined in terms of their ability to provide additional investment incentives at the least cost to the Treasury. Of these, a corporate tax rate cut is the least effective in providing additional investment incentives per dollar revenue loss to the Treasury. Shortening service lives for depreciation purposes and increasing the investment tax credit are better ways of achieving this goal.

Carl J. Palash

The financial markets Current developments

Chart 1

Recent Changes in Interest Rates



*These yields are adjusted to five- and twenty-year maturities and exclude bonds with special estate tax privileges.

Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, and Moody's Investors Service, Inc.

The combination of vigorous growth in economic activity, rising prices, and continued brisk credit demands put strong upward pressure on the monetary aggregates in the spring and early summer. As the Federal Reserve resisted those pressures on the money stock, virtually all interest rates moved up noticeably over the April-July period, after changing little on balance since the start of the year.

Money market instruments experienced the largest increases in rates in recent months (Chart 1). The Federal funds rate, which had hovered close to the 6¾ percent level since early January, started to rise in late April, when the Federal Reserve began to limit the availability of reserves relative to demand in response to sharp increases in the monetary aggregates. As monetary growth continued above the Federal Reserve's longer run objectives, the System gradually tightened its provision of reserves further, and toward the end of July Federal funds were trading around 7⅞ percent. At times, the advance in other short-term rates moved out of step with the upturn in the Federal funds rate, but near the close of July most other money market rates were also about 1⅛ percentage points or so above their early-April levels. On two occasions during the second quarter, the Board of Governors of the Federal Reserve System eventually approved actions by the Federal Reserve Banks to raise the discount rate. Increases were approved for the majority of the Reserve Banks, including New York, of ½ percentage point to 7 percent on May 11, and an additional ¼ percentage point to 7¼ percent on June 30. (The remaining Federal Reserve Banks quickly followed suit.) In announcing its approval, the Board stated that the actions were taken in recognition of

increases that had already occurred in other short-term rates.

The advance in money market rates over the spring and early summer has been spurred in part by strong demands for short-term credit. Reflecting the second-quarter rebound in the economy and increased purchases of automobiles and other consumer durables, consumer instalment loans have shown unusually large gains over the past several months. To service their consumer as well as business customers, finance companies, in turn, have stepped up their borrowing in the commercial paper market, and bank holding companies and their subsidiaries have been issuing sizable amounts of commercial paper to finance their nonbanking operations. Nonfinancial firms have also begun to show renewed interest in the commercial paper market as a source of short-term credit. Indeed, after remaining virtually flat since the summer of last year, the volume of nonfinancial commercial paper outstanding in the second quarter posted its largest increase in nearly four years.

The rise in business borrowing at commercial banks so far this year has also been unusually brisk. Over the first half of 1978, bank lending (excluding bankers' acceptances) to commercial and industrial firms advanced at an annual rate of more than 20 percent, up from the already rapid increase of 14 percent registered in 1977. Even business loan demand at the major New York City banks, which has been abnormally weak in the current recovery, has shown some signs of a modest pickup over the past several months, although recent gains remain well below those experienced at other commercial banks. To help finance strong loan demand in 1978, banks in general have been issuing substantial amounts of large-denomination time deposits, which are not subject to Regulation Q interest rate ceilings, while borrowing more heavily from nonbank sources in the markets for Federal funds and repurchase agreements. As the cost of raising short-term funds increased over the spring and early summer, most major banks boosted their prime lending rate in four ¼ percentage point steps to 9 percent by early July.

While rates on most short-term market instruments advanced by more than a percentage point over the April-July period, increases in long-term yields ranged from about 30 to 75 basis points. Within the long-term sector, municipal yields posted the largest gains. Unusually heavy borrowing by state and local governments—in part attributable to a surge in advance refundings prior to a Treasury ruling restricting these political units from setting up sinking funds invested in higher yielding taxable securities—put upward pressure on yields in that market. The smaller increases in long-term versus short-term rates over recent months largely reflect the fact that market participants had previously come to expect some gradual rise in money market rates over the spring and summer, and so these expectations were already incorporated into the yield structure at the start of the second quarter. But, subsequently, investors in long-term securities began to revise upward their expectations of the future course of interest rates in response to strong credit demands and continued sharp increases in prices.

The acceleration in monetary growth in the second quarter, coupled with several recent upward revisions to the monetary aggregates data, also weighed on market sentiment in the long-term sectors. Although each revision by itself was modest, the cumulative effect was to add significantly to the pace of monetary expansion from what was reported originally. In late March, the Board of Governors announced revisions to incorporate bench-mark adjustments for domestic nonmember banks, based on call reports for December 1976 and for March, June, and September 1977, as well as revised seasonal factors. The effect of these revisions was to raise slightly the level of M_1 in 1977 and the first two months of 1978. Then in mid-June, the Board announced further revisions incorporating new estimates of nonmember bank deposits based on the December 1977 call reports, which boosted the level of M_1 from October 1977 through May 1978. Finally, the correction of a processing error in the computation of the cash item adjustments to the demand deposit component, announced by the Board in late June, had the effect of raising the level of M_1 over the May-June period.

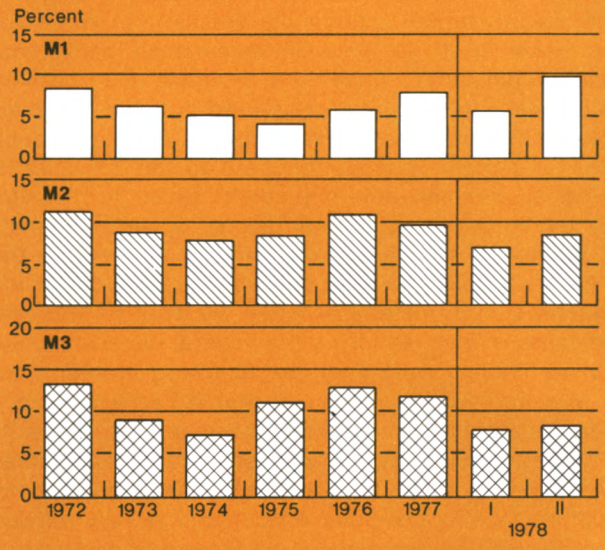
As a result of these revisions, M_1 is now estimated to have increased by 7.9 percent in 1977, compared with the 7.4 percent advance reported originally for that period. Although data available in early March of this year had suggested that M_1 would rise only sluggishly in the first quarter, revised figures show a moderate gain of 5.6 percent at an annual rate (Chart 2). Over the second quarter, the growth of M_1 accelerated to an annual rate of 9.5 percent—a record quarterly advance for the postwar period—resulting in a gain over the first half of 1978 as a whole little changed from that of 1977. By comparison, the FOMC's projected growth of M_1 for all of 1978 was a range of 4 to 6½ percent, and the same range was extended to cover the period from the second quarter of 1978 to the second quarter of 1979.

Although revisions to the broader monetary aggregates have also had the effect of boosting their growth from previous estimates, the recent expansion of these aggregates has remained well within the FOMC's longer run objectives. Over the first half of this year,

Chart 2

Growth of Monetary Aggregates

Seasonally adjusted



The annual growth rates represent the percentage change from the fourth quarter of one year to the fourth quarter of the next. The quarterly growth rates represent the percentage change from the preceding quarter, expressed at annual rates.

M_2 advanced at an annual rate of 7.7 percent, while M_3 rose by 7.9 percent. These compare with the FOMC's yearly growth ranges for M_2 and M_3 for 1978 (and also for the four-quarter period ending in the second quarter of 1979) of 6½ to 9 percent and 7½ to 10 percent, respectively. Like M_1, the broader monetary aggregates expanded more rapidly in the second quarter than in the first, but this was accounted for entirely by the acceleration in growth of the M_1 component. With market rates generally above regulatory ceiling levels on comparable maturities of savings and small-denomination time deposits at banks and thrift institutions, inflows into these deposits over the quarter as a whole continued at a moderate pace.

To provide more flexibility for banks and thrift institutions to compete for funds so as to assure an adequate flow of credit into housing and to meet other borrowing needs, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Federal Home Loan Bank Board in a joint action, effective June 1, allowed their member institutions to begin offering two new types of time certificates. The new instruments are: a six-month money market certificate with a ceiling interest rate for new deposits that changes weekly with changes in the average rate on new issues of six-month Treasury bills and an eight-year certificate with a fixed maximum rate of interest. Both new certificates allow banks and thrift institutions to offer higher yields on deposits with comparable maturities than previously permitted. Maximum rates on the money market certificates, which must be issued in denominations of $10,000 or more and are nonnegotiable, are determined by the average auction rate on new six-month Treasury bills at the regularly weekly auction, normally held on a Monday. Commercial banks may pay a rate starting on the issue date of the bills, normally the following Thursday, not to exceed the most recent auction average on a discount basis (*e.g.*, 7.425 percent in the week beginning Thursday, July 27), while savings and loan associations and mutual savings banks may pay up to ¼ percentage point more.[1] By comparison, the highest rates permitted on other time deposits with maturities of ninety days to one year are 5½ percent at commercial banks and 5¾ percent at thrift institutions. On the eight-year certificate, which must be issued in denominations of $1,000 or more, commercial banks can offer a maximum rate of 7¾ percent, while thrift institutions can pay up to 8 percent. Under previous regulations, yields on certificates with maturities of six years or more at banks and thrift institutions were limited to 7½ percent and 7¾ percent, respectively.

So far the money market certificates appear to be attracting considerable buying interest, while the new long-term certificates seem to be less popular. Insured commercial banks issued an estimated $2.1 billion in money market certificates over the first twenty-eight days of June. Thrift institution sales were apparently even stronger, reflecting the rate ceiling differential and their more intense promotion. Data collected by the Federal Home Loan Bank Board from a sample of large savings and loan associations (holding among them 40 percent of industry-wide deposits) show that these institutions issued about $2.5 billion of money market certificates in June and an additional $1.3 billion over the first ten days of July. As of July 10, the volume of money market certificates at these institutions comprised about 2.3 percent of their total outstanding deposits. Surveys conducted by the National Association of Mutual Savings Banks of large mutual savings banks (holding more than 90 percent of total savings bank deposits) show sales of about $1.5 billion over the first twenty-eight days of June and $700 million more over the subsequent week. By July 5,

[1] Compounding the return on a daily basis, as is done by many banks and thrift institutions, results in higher annual rates.

the amount of money market certificates at these institutions represented about 1.5 percent of their total deposits.[2] Respondents to the savings and loan association survey estimate that about 40 percent of the dollar volume of money market certificates issued so far represents new funds raised, with the balance coming from transfers from existing savings and time deposits within the same institution. Mutual savings bank respondents estimate a smaller proportion—about 25 percent—of new funds raised, probably because these institutions have a much higher percentage of their deposits in passbook accounts which can be shifted quickly without any interest rate penalty.

The surveys by themselves do not provide very strong evidence on whether the new money market certificates have enabled thrift institutions as a whole to attract more deposits than they would otherwise. On the one hand, even new funds raised at one institution could represent transfers from existing accounts at others; on the other hand, deposits transferred from an existing account to a money market certificate might otherwise have been withdrawn in the absence of the availability of the new certificate. Other information, however, suggests that the new money market certificates have indeed enabled thrift institutions to attract or to retain deposits. First, inflows of total deposits to thrift institutions strengthened somewhat in June from May's pace, despite a further rise in market yields. Also, investments in money market mutual funds, an increasingly important substitute for thrift deposits, showed less growth in June than in earlier months.

[2] Data on sales of the new eight-year certificates are available only for large mutual savings banks. They show an estimated $357 million of these certificates was outstanding as of July 5.

In addition to establishing new types of time certificates, the Board of Governors recently announced two other actions designed to improve the functioning of the financial system. In May, the Board amended its regulations to facilitate the participation of member banks in a newly announced Treasury program for the handling of its funds in commercial banks and other depositaries. Under the program, the Treasury will invest funds in interest-bearing notes of commercial banks and will compensate banks directly through fees for certain services rendered to the Treasury. It is hoped that the new procedure, which will be implemented following appropriations by the Congress of funds to cover the fee payments, will enable the Treasury to maintain reasonably stable balances at the Reserve Banks, thereby reducing the need for frequent and massive intervention by the Federal Reserve's open market Trading Desk (see the following article). Also in May, the Board announced that it had approved a plan permitting member banks, beginning November 1, to offer their nonbusiness customers arrangements whereby funds could be transferred automatically from savings to checking accounts. The new service can be used to cover checking overdrafts or to maintain a minimum checking account balance, provided that arrangements by the bank and its customers are made in advance. In explaining the desirability of the move, the Board cited the resulting greater convenience and efficiency of savings accounts and the benefits due to a reduction in the number of checks written on accounts with insufficient funds. Depending on the charges imposed by banks and the degree of public participation, the new service could also have important implications for the interpretation of the monetary aggregates by further blurring the distinction between demand and savings deposits.

Treasury tax and loan accounts and Federal Reserve open market operations

Treasury management of its cash balances is significant for Federal Reserve open market operations because changes in the Treasury's balance at the Federal Reserve Banks directly affect the reserves available to the banking system. All participants in the financial economy find it necessary to maintain a cash balance, given the impossibility of achieving precise balance each day between receipts and expenditures. Unlike most other entities, however, when the Treasury pays out to or receives funds from the public, aggregate bank reserves are affected and not just the distribution of those reserves among banks.

The Treasury's working balance is maintained at the Federal Reserve Banks, the Government's fiscal agents, and most of the Treasury's expenditures are made through checks paid by the Reserve Banks. However, the Treasury receives most of its funds through transfers from commercial banks. These receipts must flow through the Treasury's balance at the Reserve Banks in order to reenter the banking system as expenditures. As funds flow from the public to the Reserve Banks, commercial bank reserves are reduced while Treasury expenditures from the Reserve Bank balances generate reserve increases. Without a procedure to neutralize the effects of these transfers, abrupt reserve adjustments would be forced on the banking system—leading to large-scale swings in credit availability and attendant volatility in the money and securities markets.

The Treasury tax and loan account system was designed as a mechanism for minimizing the dislocations on bank reserves and the money market arising out of the sizable and irregular transfers between the Government and the public. Under this system, Treasury funds remained in the banking system until needed for disbursement, and procedures were developed so that withdrawals to meet those disbursements were effected with minimum disturbance of bank reserves. For many years it was felt that the value of these deposits to the banks was roughly equivalent to the value of services which the banks provided the Treasury. In more recent years, however, the Treasury's average cash holdings rose as did the average level of interest rates, and following a reexamination of the tax and loan account system in 1974 it was found that the value of the balances to the banks—and implicit costs to the Treasury—far exceeded the value of the services provided.

After this study, the Treasury sought legislative authority to invest its operating cash in a way that would provide an appropriate return to the Treasury on its cash balances while at the same time making it possible for banks to be reimbursed for services performed for the Treasury. In the interim, the Treasury altered its cash management procedures, shifting the bulk of its balances to the Federal Reserve where a return could be obtained indirectly since net System earnings are turned over to the Treasury. The new legislative authority, enacted in October 1977, will once again permit Treasury funds to remain in the banking system. Depositaries will have the opportunity to retain Treasury funds at a market-based interest rate. Moreover, the new system should alleviate the scale and complexity of Federal Reserve open market operations—and perhaps reduce some market misunderstandings about those operations—that arose from the Treasury's interim procedure of holding the bulk of its balances at the Reserve Banks. The investment program will become effective following appropriation of funds by the Congress to cover the reimbursement to depositaries for

services deemed compensable—those provided specifically for the benefit of the Government.

Historical background

The system of special depositaries for Treasury funds originated during World War I, when the scale of the Government's financial operations was stepped up sharply. The principal purposes were to reduce the impact of the Government's growing operations on the banking system and to foster the distribution of the large loans necessary to finance the war. The first Liberty Loan Act of 1917 provided that banks purchasing securities issued under the terms of the act, for themselves or for account of their customers, could deposit the proceeds of such purchases in special accounts called war loan accounts. Payment for the securities was thus effected by debiting an account in a commercial bank and crediting an account of the Treasury at the same bank, with the Treasury holding the funds in that account until needed to pay Government checks. At that time, the Treasury arranged, through "call" procedures, for the transfer of funds into the Reserve Banks where checks would be presented and paid, thus returning the funds at once to the banking system. Destabilizing effects on bank reserves were thereby avoided, while the value of the deposits provided an incentive for banks to purchase and distribute new Treasury securities. Greater use of the war loan accounts was necessitated by the heavy financing needs of World War II. After the war, the Congress provided for wider uses of the system by authorizing the payment of certain taxes through the accounts and, from 1948 on, the kinds of taxes eligible for deposit in these accounts have been broadened. The war loan accounts were renamed tax and loan accounts in 1950, and today the bulk of the funds flowing through the accounts arises out of tax payments.

In using these accounts for the purposes of cash management, the Treasury sought to keep its balance at the Reserve Banks relatively stable and allowed the bulk of the variation in its balances to occur in the banking system. This involved some redistribution of reserves among banks but left the aggregate amount of reserves approximately steady. The Treasury accomplished this by calling from, or redepositing with, the depositaries funds sufficient to preserve a relatively stable Reserve Bank balance. Every incorporated bank and trust company and every United States branch of a foreign banking corporation authorized by the state in which it was located to transact commercial banking business could be designated as a special depositary and maintain a tax and loan account by applying for qualification at its district Reserve Bank and by pledging collateral, deemed acceptable by the Treasury, to cover its deposits. To facilitate the schedule of withdrawals from such accounts, banks were administratively divided into three groups (A, B, or C), based on the total deposits credited to their tax and loan accounts during the previous calendar year. Most banks were in Group A which included the smaller banks. Calls on these banks were the least frequent, and they were provided with the most advance notice of intended withdrawals. At the opposite end were the Group C banks, the largest in tax and loan account size but the smallest in number, on which calls were scheduled with the greatest frequency. These banks were also subject to accelerated calls or redeposits on same-day notice to provide the Treasury greater flexibility in dealing with unanticipated developments.

Over time, the view developed that the Treasury's cash balances in the commercial banks resulted in a subsidy to the banking system. This view led to several studies by the Treasury in the early 1960's in which it concluded that the earnings value to the banks of the tax and loan accounts approximately compensated the banks for the specific services they performed for the Federal Government, services for which no direct compensation was received. (After meeting demand deposit reserve requirements, the depositaries could invest the remainder of the balances in earning assets.) The Treasury studies found that the services provided by the banks—among others, for example, the handling of tax deposits or issuing and redeeming savings bonds—had a value similar to that of the interest-free deposits.

Reappraisal of the tax and loan account system

In 1974, the Treasury undertook another study of the tax and loan system and reached different conclusions, based on developments in the intervening years. In the ten years following the previous study, taxes flowing through the accounts had increased fourfold and the higher level of receipts and expenditures by the Government in the interim had also led to an increase in the size of the tax and loan balances. Moreover, interest rates had risen considerably, providing significantly greater earnings potential on tax and loan balances—earnings foregone by the Treasury. Finally, the Treasury found that fewer "compensable" services were being provided. As a result, the study concluded that the implicit costs to the Treasury of maintaining the accounts had risen substantially beyond the value to the Treasury of the applicable services provided by the banks. The Treasury estimated the excess of annual earnings value to the banks at $260 million. The study concluded that the system of maintaining temporary excess cash with the commercial banks was useful for money management and should be retained,

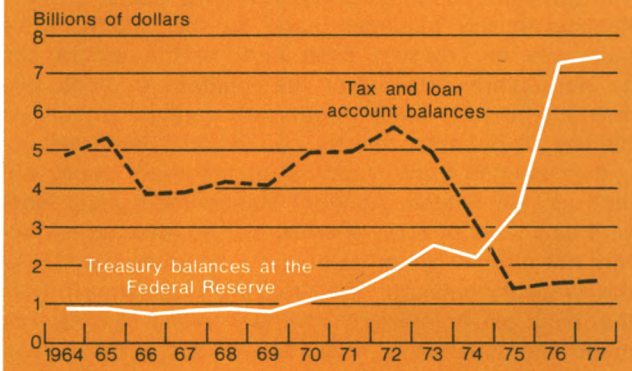
but in a way that would allow the Treasury to capture the return on the balances while reimbursing banks for certain services with fees from appropriations.[1]

Legal prohibition against payment of interest on demand deposits precluded the obvious way for the Treasury to realize a return on its balances with the banks. Yet time deposits were of little use since their minimum maturity is thirty days, compared with the average life of a tax and loan deposit of about ten days. The Treasury concluded that the best solution would be to invest excess balances on a day-to-day basis in some kind of short-term money market instrument, preferably with the banks holding the tax and loan balances to minimize churning in the money market that would result from actually entering the market to invest balances of the magnitude involved. Congressional legislation authorizing this investment technique was required, however.

As an interim solution to the problem of earning a return on its working balances, the Treasury began in 1974 to reduce its tax and loan accounts at commercial banks while at the same time increasing its balances at the Federal Reserve. This had the effect of reducing commercial bank income on the tax and loan balances and at the same time increasing Federal Reserve Bank income and, eventually, Treasury income. This followed since the Federal Reserve earns a return on the securities acquired to offset the reserve-draining impact of the higher Treasury balance and since the Federal Reserve turns over the great bulk of its net earnings to the Treasury. From the survey data compiled in connection with the 1974 study, the Treasury calculated that a reasonable equilibrium between the value of balances at commercial banks and the value of services would be achieved by an average balance of about $1.5 billion or so in the tax and loan accounts. Since mid-1974, the Treasury has followed a policy of making calls on its accounts in a manner that would result in approximately that level (chart).

Distribution of Treasury Cash Holdings

Annual averages



Source: United States Department of the Treasury.

Average Weekly Change in Treasury Balance

In millions of dollars

Year	At the Federal Reserve	At the Federal Reserve and in tax and loan accounts
1967	177	1,074
1968	172	1,434
1969	222	1,493
1970	124	1,360
1971	241	1,346
1972	329	1,592
1973	478	1,781
1974	533	1,623
1975	1,416	1,915
1976	2,018	2,496
1977	2,110	2,601

Source: Board of Governors of the Federal Reserve System.

Impact of swings in Treasury cash on reserve management

While the interim arrangement described above, in effect, served the purpose of providing the Treasury with income on its balances and avoided any possibility of a "windfall" to the banks, it considerably complicated the execution of monetary policy. Frequent and sizable System open market operations became necessary to offset the sharp fluctuations in bank reserves that would otherwise have resulted from the variations in

[1] Report on a study of tax and loan accounts, Department of the Treasury, June 1974.

Treasury balances at the Reserve Banks. Substantial changes in the balances arise from the concentration of expenditures, tax collections, and debt operations in certain months and on certain days of each month. For example, social security payments cause a sharp decline in the balances early in the month, while increases in Treasury cash later in the month can be particularly large after the fifteenth of each tax-payment month. Such large cash swings amount to billions of dollars over the course of a few days.

In managing bank reserves for monetary policy objectives, the System Account Management must work with estimates of how reserves will be affected by factors not directly under its control, including the size of the Treasury balance. The Treasury's decision to hold the bulk of its balance at the Reserve Banks has made the balance a dominant—and the most volatile—factor. The exact timing of receipts to and expenditures from the Treasury's balance is not known in advance, of course, and dealing with the size and timing of Treasury balance fluctuations has been the principal complication in the management of bank reserves. The magnitude of the fluctuations has been very large, not only from week to week but also within a week, and predicting their impact on bank reserves has been difficult and prone to error. The large weekly changes in the Treasury balance (table) have been accompanied by a substantial rise in the System's average weekly provision or absorption of reserves, from around $300 million in 1967 to around $2 billion in 1977. The scale of these operations has added a highly cumbersome dimension to the execution of monetary policy. The successful implementation of the Treasury's new investment authority should lead to a material improvement of this situation.

The new cash management procedures

The intent of the new legislative authority—Public Law 95-147 of October 1977—is to permit the Treasury to earn interest by the investment of its operating cash and to pay fees for certain services which were not previously compensable. The enabling legislation provides that "the Secretary of the Treasury is authorized, for cash management purposes, to invest any portion of the Treasury's operating cash for periods of up to ninety days in (1) obligations of depositaries maintaining Treasury tax and loan accounts secured by a pledge of collateral acceptable to the Secretary of the Treasury as security for tax and loan accounts, and (2) obligations of the United States and of agencies of the United States". In addition to incorporated banks and trust companies, the legislation makes certain savings and loan associations and credit unions eligible to participate in the tax and loan account system.

Treasury tax and loan account depositaries will administer their accounts under either a note option or a remittance option. The sources of deposits in the tax and loan accounts represent payments of certain Federal taxes and payments for United States savings bonds. Both options require that balances be secured by the pledge of acceptable collateral. Under each option, depositaries may have interest-free use of the funds for one business day (although balances on this interest-free day are subject to demand deposit reserve requirements). Thereafter, the accounts will function differently, depending on the option selected.

The Treasury will invest funds in obligations of depositaries selecting the note option. Such investments will take the form of open-ended interest-bearing notes reflected on the books of the district Reserve Bank. Under this procedure, the depositary will, as of the first business day after crediting deposits to its tax and loan account, debit the tax and loan account in the amount of these deposits and simultaneously credit the note. The Federal Reserve Board has exempted note balances of member banks from reserve requirements and interest rate ceilings under the provisions of Regulations D and Q, respectively. A note option depositary may also be allowed to add directly to its note balance payments made for allotments on tenders and subscriptions for new United States Treasury securities when so provided in Treasury offering circulars. In addition, other funds from the Treasury's operating cash will be offered directly to certain note option depositaries. These direct investments, analogous in concept to former redeposits, will provide an important degree of flexibility for managing Treasury cash balances in a way that prevents undesirable fluctuations in the balance at the Reserve Banks from the standpoint of reserve management.

Note balances are payable on demand without previous notice. In practice, the Treasury expects that the timing and amount of call actions for the withdrawal of funds will follow a regular pattern reflective of the intramonthly and monthly patterns of its cash flow. The A, B, or C group classifications will be retained for note option depositaries.

The notes will pay interest equal to the weekly average effective Federal funds rate published by the Federal Reserve less 25 basis points,[2] a formula which gives recognition to costs of alternative collateralized

[2] Interest is payable monthly by charges to the depositary's reserve account or through the reserve account of a member bank correspondent. The amount of interest due will be computed by applying the weekly interest rate factor to the daily average amount of the note balance in each week of the reporting cycle. A reporting cycle begins on the first Thursday of each month and ends on the Wednesday preceding the first Thursday of the next month.

borrowings by banks and to the depositaries' short-term investment potential for such funds. Each depositary may establish a ceiling on the amount of Treasury funds held by providing written notice to its district Reserve Bank. Note balances in excess of the specified ceilings will be automatically transferred immediately to the Treasury's account at the Reserve Banks. It is expected that such maxima would be set in relation to the depositaries' collateral-pledging ability.

Depositaries that do not wish to hold Treasury funds may select the remittance option, in effect acting as channeling agents in the tax collection system. Under this procedure, deposits credited to the tax and loan account will be automatically withdrawn by the district Reserve Bank immediately on receipt of the credit advices supporting such deposits. Depositaries electing this option will be subdivided into two classifications: Class 1 depositaries are those with $1.5 million or more in credits to their tax and loan accounts during the preceding calendar year, while Class 2 depositaries are those whose credits were less than $1.5 million. To limit the interest-free use of the funds to one business day, remittance option depositaries will be subject to assessments on advices received after designated cutoff times, with the method of assessment based on the applicable classification.

Each depositary is subject to the requirements of the option it has selected. Changes in options will be permitted after appropriate notice to the Reserve Bank, a provision intended to afford depositaries with an opportunity to change options on an occasional basis.

All depositaries will be reimbursed for services deemed compensable. The Treasury will compensate depositaries for Federal taxes at a uniform fee of 50 cents for each Federal tax deposit form processed, a fee intended to cover the costs of maintaining the account as well as the handling of Federal tax deposits. Reimbursement to qualified agents for the issuance of savings bonds will be made for each savings bond issued during a calendar quarter. The fee schedule depends on the method of issuance and inscription and ranges from 10 cents to 70 cents per bond. Paying agents will receive reimbursement of 30 cents for each bond redeemed during the calendar quarter.

Concluding observations

The Treasury's investment authority may be viewed as the natural outgrowth of a trend more actively pursued by financial institutions, corporations, and state and local governments generally: the productive employment of cash balances and use of explicit service pricing. The new program will be implemented following appropriation by the Congress of funds to cover the fee payments. From the Treasury's viewpoint, the implementation of the program will satisfy its need for obtaining a satisfactory return on its balances, while also allowing incentive for depositaries to participate in the system. From the perspective of both the Treasury and the Federal Reserve, facilitating the execution of monetary policy is a major goal of the program. Under the new investment authority the Treasury will directly obtain a return presently achieved indirectly via net Federal Reserve earnings, without the current operational complications to Federal Reserve open market operations. In addition, since the Treasury will earn a return on balances held by the depositaries in excess of one business day, the Treasury will be able to capture a return on funds in transit between the depositaries and the Reserve Banks not previously available.

For the depositaries, the new facility provides an opportunity to acquire the temporary use of Treasury funds at a money market-based rate. Presumably, each bank or other depositary will make its selection of options dependent on whether the funds can be employed profitably. In turn, this will hinge on the relationship of the Federal funds rate to alternative borrowing costs and investment opportunities, as well as on the adequacy of existing collateral. Most large banks are expected to elect the note option. On the fee side, each depositary will be compensated on an individual basis in direct proportion to the volume of services it provides, in contrast to the current practice of reimbursement through balances which are not directly related to the volume of services.

Conclusions on the impact of the program will have to await the test of time. For the depositaries, spreads between short-term interest rates may, at times, make it advantageous to enlarge collateral holdings in order to retain Treasury funds for profitable investment. Individual depositaries may sometimes find it cost effective to use holdings of United States Government securities as collateral for Treasury funds rather than for use in repurchase agreements. It is questionable, however, whether these substitutions would be of such magnitude as to affect rate levels in the RP market generally. This market has become an efficient and attractive source of funds to banks (see *Quarterly Review,* Summer 1977) while meeting the short-term investment needs of their customers. Similarly, there could be an impact on flows in the Federal funds market. The retention of Treasury funds by many depositaries could lead to a reduction in net demands in the Federal funds market, but there could also be a reduction in the volume of reserves provided by the Federal Reserve. Thus, although some impact on flows in the Federal funds market could develop, it is not clear that

rate levels would be affected. The source of reserves to the banking system would be different than at present but not necessarily the overall supply of such reserves.

For the Federal Reserve, once the extent of participation in the note option is known, experience will be needed in projecting the rate of remittance flows and their impact on reserves. The ceilings set by the note option depositaries may complicate the task of putting reserves back on course, at least initially. As observed above, note balances in excess of the specified maxima will be automatically transferred immediately to the Reserve Banks. Since these ceilings will vary among depositaries and will be approached at different times by different depositaries, experience also will be needed in monitoring the pattern of these flows and their reserve impact. It is hoped that this would be only a transitory impediment to reserve management since, from the Federal Reserve's standpoint, the success of the program will be diminished or negated if the present difficulties in managing reserves are merely supplanted by other complications.

No doubt, there will be some uncertainties during the transition period, while the Treasury, the Federal Reserve, and the depositaries gain experience with the new program. In recognition of this, the Treasury plans to follow a gradual approach in reducing its balances at the Reserve Banks.

Joan E. Lovett

A New Supervisory System for Rating Banks

The commercial banking system which serves the United States is a very diverse one. Its nearly 14,500 banks range from single-office institutions, with less than $1 million in assets and serving a limited market area, to the international banking giants with hundreds of offices located in the world's financial centers and with assets which total many billions of dollars. Federal supervision of such a diverse banking system is necessarily a complex and demanding task for the three agencies that share responsibility for seeing that the banking system is safe and sound and serves the financial needs of the nation. While all three Federal agencies have approached the analysis of bank condition in a somewhat similar way, past differences in bank rating procedures and techniques used by the agencies had complicated the task of evaluating the condition of the banking system as a whole. In May, the Federal Reserve System, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation (FDIC) announced adoption of a uniform system for rating the condition of the nation's commercial banks.

The new rating system gives senior officials at the supervisory agencies a capsule summary of the condition of individual banks as well as an indication of the health of groups of banks or the overall banking system. The ratings are intended as a tool to focus attention on real and potential problems and to permit the effective allocation of supervisory resources among the banks. Federal law gives primary supervisory responsibility for the nation's 4,700 national banks to the Office of the Comptroller of the Currency. The Federal Reserve System exercises direct supervisory authority over about 1,000 banks that are chartered by state banking authorities and that are members of the Federal Reserve System. The FDIC provides Federal supervision over more than 8,700 insured, state-chartered commercial banks that are not members of the Federal Reserve System. In addition, the Federal Reserve System is charged with primary responsibilities for supervising the more than 2,000 bank holding companies in the United States with one or more commercial bank subsidiaries.

The new Uniform Interagency Bank Rating System will help ensure consistency in the way the Federal bank supervisors' view individual banks within the banking system. The new rating system has two main elements:

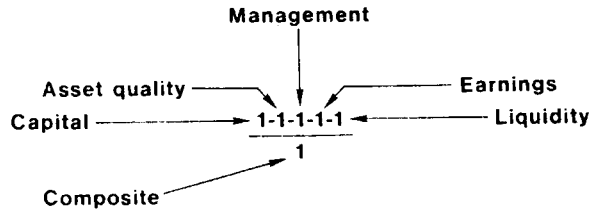
(1) An assessment by Federal bank examiners or analysts of five critical aspects of a bank's operations and condition. These are adequacy of the bank's capital, the quality of the bank's assets (primarily its loans and investments), the ability of the bank's management and administration, the quantity and quality of the bank's earnings, and the level of its liquidity.

(2) An overall judgment incorporating these basic factors and other factors considered significant by the examiners or analysts, expressed as a single composite rating of the bank's condition and soundness. Banks will be placed in one of five groups, ranging from banks that are sound in almost every respect to those with excessive weaknesses requiring urgent aid.

The new rating system builds upon the foundation of earlier systems used by the three agencies. These rating systems date back to at least as early as 1926 when the Federal Reserve Bank of New York used a simple system to categorize over 900 member banks then in the Second District.[1] Each of the three Federal banking supervisors adopted its own rating system in the mid-1930's after extensive interagency discussion. These systems tended to be very complex and attempted to combine subjective judgments and quantitative standards.[2] Probably because of their rigidity and complexity, coupled with improvements in the strength and stability of the nation's economy and banking system, these rating systems began to fall into disfavor in the 1940's as simplified approaches were sought. In 1952, the Federal Reserve System and the Office of the Comptroller of the Currency agreed on the basic structure of a rating system. That system, like the new uniform system, provided for separate ratings for capital adequacy, asset quality, and management and included an overall judgment of the bank's condition.[3]

The Federal Reserve's responsibility for supervising the activities of the nation's registered bank holding companies created particular interest in the design of an improved system for rating banks which could be used by all three Federal bank regulatory agencies. The new uniform system was designed, in large part, by a group headed by Eugene A. Thomas, vice president of the Federal Reserve Bank of San Francisco, working under the direction of the Federal Reserve Bank Presidents' Conference Committee on Regulations, Bank Supervision, and Legislation.

Under the new system, each performance characteristic and the composite is rated on a scale from one to five, which indicates the extent of the bank's strength or weakness. A rating of "1" indicates strength; "5" indicates a degree of weakness requiring urgent corrective actions. Thus, the strongest possible rating for a bank would be:



On the other hand, a rating of $\frac{4\text{-}5\text{-}4\text{-}5\text{-}3}{4}$ would indicate a bank with critical problems with asset quality and earnings and an overall condition that is less than satisfactory. Close supervisory attention and financial monitoring would be indicated by such a rating.

The examiner-analyst in using the new system evaluates each of the five elements of a bank's condition and the composite rating independently according to specifically defined standards. (See box for the definitions of each composite rating and the description of each performance zone as agreed upon by the three agencies.) While the five performance dimensions are somewhat interdependent, each is rated separately. Similarly, the composite is not determined by calculating an average of the separate components but rather is based on an independent judgment of the overall condition of the bank. Other factors, such as local economic conditions and prospects, trends in financial performance, and affiliation with a bank holding company, are evaluated by the examiner-analyst and incorporated into his overall assessment of the bank's condition.

Arriving at a six number representation of a bank's condition is an exercise which requires sound analytical judgment. It is admittedly an attempt to reduce to quantified terms a very complex judgmental evaluation process. A single ratio or group of ratios cannot fully or accurately describe all the underlying factors that influence a bank's past, present, or future performance. Thus, consistency in the new system depends not, for example, on rigid definitions of what constitutes adequate earnings but rather on an appreciation by the examiner-analyst of the several roles earnings play in making a bank sound and the matching of the bank's particular and peculiar situation to the agreed-upon definitions.

The first of the five performance dimensions—*capital adequacy*—gives recognition to the role that capital plays as the foundation supporting business risks within the bank. The greater the risks faced by a bank, the greater is its need for a strong capital base. In appraising these risks, the Federal supervisors review the risk "mix" of the asset portfolio as well as the skill

[1] This rating system went by the name of MERIT. Based heavily upon management and asset quality in relation to capital, a rating of M was assigned for banks in good condition, E for satisfactory condition, R for fair, I for unsatisfactory, and T for serious.

[2] One system "scored" six characteristics—management, loans, securities, capital account, deposit growth, and earnings—and combined these numeric scores with a series of weighting factors. Judgmental inputs on factors not specifically measured were not permitted, making the resulting score difficult to interpret either as an absolute measure of condition or even in its relationship to other scores.

[3] The Federal Reserve and the Comptroller of the Currency have used what is essentially this rating system almost continuously since it was originally adopted. The specific definitions used in that system were included in former Governor Robert Holland's testimony before the Committee on Banking, Housing, and Urban Affairs, United States Senate (February 6, 1976).

I. Composite Rating

The five composite ratings are defined as follows:

Composite 1
Banks in this group are sound institutions in almost every respect; any critical findings are basically of a minor nature and can be handled in a routine manner. Such banks are resistant to external economic and financial disturbances and capable of withstanding the vagaries of the business cycle more ably than banks with lower composite ratings.

Composite 2
Banks in this group are also fundamentally sound institutions but may reflect modest weaknesses correctable in the normal course of business. Such banks are stable and also able to withstand business fluctuations well; however, areas of weakness could develop into conditions of greater concern. To the extent that the minor adjustments are handled in the normal course of business, the supervisory response is limited.

Composite 3
Banks in this group exhibit a combination of weaknesses ranging from moderately severe to unsatisfactory. Such banks are only nominally resistant to the onset of adverse business conditions and could easily deteriorate if concerted action is not effective in correcting the areas of weakness. Consequently, such banks are vulnerable and require more than normal supervision. Overall strength and financial capacity, however, are still such as to make failure only a remote possibility.

Composite 4
Banks in this group have an immoderate volume of asset weaknesses, or a combination of other conditions that are less than satisfactory. Unless prompt action is taken to correct these conditions, they could reasonably develop into a situation that could impair future viability. A potential for failure is present but is not pronounced. Banks in this category require close supervisory attention and monitoring of financial condition.

Composite 5
This category is reserved for banks whose conditions are worse than those defined under Composite 4. The intensity and nature of weaknesses are such as to require urgent aid from the shareholders or other sources. Such banks require immediate corrective action and constant supervisory attention. The probability of failure is high for these banks.

II. Performance Evaluation

The five key performance dimensions—capital adequacy, asset quality, management-administration, earnings, and liquidity—are evaluated on a scale of one to five defined as follows:

Rating No. 1 indicates *strong* performance. It is the highest rating and is indicative of performance that is significantly higher than average.

Rating No. 2 reflects *satisfactory* performance. It reflects performance that is average or above; it includes performance that adequately provides for the safe and sound operation of the bank.

Rating No. 3 represents performance that is flawed to some degree; as such, is considered *fair*. It is neither satisfactory nor marginal but is characterized by performance of below-average quality.

Rating No. 4 represents *marginal* performance which is significantly below average; if left unchecked, such performance might evolve into weaknesses or conditions that could threaten the viability of the institution.

Rating No. 5 is considered *unsatisfactory*. It is the lowest rating and is indicative of performance that is critically deficient and in need of immediate remedial attention. Such performance by itself, or in combination with other weaknesses, could threaten the viability of the institution.

with which management plans ahead and minimizes risks. The vitality of a bank's market area is also included in the analysis. The examiner-analyst also reviews the bank's capital-to-risk assets relationship, its trend, and a comparison of the bank's ratio with other banks of similar size and doing similar types of business.

An appraisal of the quality and collectibility of a bank's loans and investments has traditionally been one of the key parts of a Federal supervisory examination. The *asset quality* performance rating is largely based upon data on the overall quality of the assets held by the bank as developed during a supervisory examination. The new system, like earlier ones, relies heavily upon the classification of the bank's credits into loss, doubtful, and substandard categories ac-

cording to the likelihood of the bank's actually absorbing a loss on a credit.[4] Loan and investment policies, the adequacy of valuation reserves, and management's demonstrated ability to collect problem credits would also be considered by the examiner-analyst in coming to a judgment regarding overall asset quality.

The third element in the rating evaluates the quality of a bank's corporate *management* including its board of directors. Management's technical competence, leadership, and administrative ability are evaluated along with the internal controls and operating procedures that have been installed. The bank's compliance with banking laws and regulations is another factor in the appraisal, as are the provisions for management succession. Judgments regarding management's willingness and ability to serve the legitimate banking needs of the community are also considered.

The strength of the bank's *earnings* is the fourth element in the performance rating. Here, a judgment is rendered on the adequacy of earnings to provide a sufficient return to the bank's stockholders, to generate sufficient cash flows for the normal needs of borrowers, and to provide for the future needs through the development of capital. The "quality" of earnings is also analyzed, with particular attention paid to the adequacy of the bank's additions to valuation reserves and to the tax effects on net income. Peer-group comparisons and trends in earnings provide additional quantitative evidence for the rating.

The *liquidity* rating is based upon the bank's ability to manage its assets and liabilities in such a way as to ensure that it can meet the demands of both depositors and borrowers without undue strain. Among the factors considered in evaluating liquidity are the availabilty of assets readily convertible into cash, the bank's formal and informal commitments for future lending or investment, the structure and volatility of deposits, the reliance on interest-sensitive funds including money market instruments and other sources of borrowing, and the ability to adjust rates on loans when rates on interest-sensitive sources of funds fluctuate. The examiner-analyst will review the frequency and level of borrowings and include judgments of the bank's ability to sustain any level of borrowings over the business cycle or to attract new sources of funds. These judgments also include analyses of the bank's present and future access to traditional money market sources of funds and other domestic and foreign sources. The bank's average liquidity experience over a period of time, as well as its liquidity position on the examination date, would be considered. For Federal Reserve member banks, the use of the discount window is also reviewed to determine if borrowings are for other than seasonal or short-term adjustment purposes.

After analyzing the five key factors, the examiner-analyst arrives at a *composite rating* which summarizes the agency's overall view of the bank's condition and reflects the level of continuing supervisory attention which the bank's condition seems to warrant. A composite "1" rated bank would receive little supervisory attention between examinations, while a composite "5" bank would be subject to constant monitoring and a corrective action program developed by the bank's management and directors and accepted by its Federal supervisors.

The new rating system provides a uniform structure for use by the three Federal supervisory agencies in evaluating the condition of the nation's commercial banks. This uniformity of approach is expected to lead to more consistent and even-handed supervisory treatment. It should also enable more informed judgments regarding trends in the condition of the banking system as a whole.

George R. Juncker

[4] The usual rule of thumb used for interpreting these classifications is that all credits classified loss will indeed represent eventual losses, 50 percent of aggregate credits classified doubtful will be charged off, as well as 20 percent of substandard classifications. Of course, actual loss experiences vary from credit to credit and bank to bank depending upon a wide variety of circumstances.

February-April 1978 Interim Report
(This report was released to the Congress and to the press on May 31, 1978.)

Treasury and Federal Reserve Foreign Exchange Operations

In late 1977-early 1978, the United States dollar had come under generalized selling pressure in increasingly disorderly exchange market conditions. Among the steps taken by the United States authorities to counter the disorder, the Federal Reserve's foreign exchange Trading Desk had shifted in early January to a more open and forceful intervention approach, utilizing the resources of both the Federal Reserve and the United States Treasury. These operations, in coordination with the intervention by the trading desks of foreign central banks, helped restore a sense of two-way risk to the market and dollar rates settled somewhat above their earlier lows. On January 31, swap drawings in German marks on the Bundesbank had reached $1,251.2 million equivalent by the Federal Reserve and $407.4 million equivalent by the United States Treasury. The Federal Reserve had also drawn $18.9 million equivalent of Swiss francs under the swap arrangement with the Swiss National Bank to finance intervention in that currency.

Despite these actions, market psychology remained extremely bearish toward the dollar. Abroad, economic growth continued to fall short of official expectations, holding out little promise of an early reduction in the United States trade and current account deficits through a demand-induced expansion in our exports. In the United States, the Administration's energy bill, designed to curb the rise in oil imports over time, remained bottled up in the Congress. Moreover, both a prolonged coal strike and the fierce winter weather raised uncertainties over the near-term outlook for the domestic economy and the trade balance. And, of growing concern to the market, the pace of inflation was quickening in the United States even as price increases in other major countries continued to moderate.

These concerns underlay the heavy selling pressure on the dollar, which reemerged toward mid-February. As the markets again became unsettled, the United States authorities together with those of other major countries continued to intervene forcefully. The Federal Reserve Bank of New York operated on ten trading days between February 10 and 28, selling a total of $714.5 million equivalent of marks. These sales were split evenly between the Federal Reserve and the Treasury and were financed by drawings on their respective swap lines with the Bundesbank. The Federal Reserve also sold a further $50.1 million of Swiss francs, financed by drawings on its swap line with the Swiss National Bank.

By late February the dollar had declined generally, falling as much as 5 percent against the German mark and 9 percent against the Swiss franc. The Swiss authorities then imposed harsh new exchange controls

A report by Alan R. Holmes and Scott E. Pardee.
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Table 1

Federal Reserve Reciprocal Currency Arrangements

In millions of dollars

Institution	Amount of facility April 30, 1978
Austrian National Bank	$ 250
National Bank of Belgium	1,000
Bank of Canada	2,000
National Bank of Denmark	250
Bank of England	3,000
Bank of France	2,000
German Federal Bank	4,000*
Bank of Italy	3,000
Bank of Japan	2,000
Bank of Mexico	360
Netherlands Bank	500
Bank of Norway	250
Bank of Sweden	300
Swiss National Bank	1,400
Bank for International Settlements:	
Swiss francs-dollars	600
Other authorized European currencies-dollars	1,250
Total	$22,160*

* Increased by $2,000 million effective March 13, 1978.

Table 2

Federal Reserve System Drawings and Repayments under Reciprocal Currency Arrangements

In millions of dollars equivalent; drawings (+) or repayments (−)

Transactions with	System swap commitments January 31, 1978	February through April 30, 1978	System swap commitments April 30, 1978
German Federal Bank	1,251.2	+592.6 −136.1	1,707.8
Swiss National Bank	18.9	+ 50.1	69.0
Total	1,270.1	+642.8 −136.1	1,776.8

Because of rounding, figures may not add to totals.
Data are on a transaction-date basis.

Table 3

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

In millions of dollars equivalent

System swap commitments January 31, 1978	February through April 30, 1978	System swap commitments April 30, 1978
470.1	−88.2	381.9

Data are on a transaction-date basis.

Table 4

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

In millions of dollars; drawings (+) or repayments (−)

Banks drawing on Federal Reserve System	Outstanding January 31, 1978	February through April 30, 1978	Outstanding April 30, 1978
*Bank for International Settlements (against German marks)	147.0	+148.0 −295.0	-0-
Total	147.0	+148.0 −295.0	-0-

Data are on a value-date basis.

* BIS drawings and repayments of dollars against European currencies other than Swiss francs to meet temporary cash requirements.

Table 5

United States Treasury Securities, Foreign Currency Series Issued to the Swiss National Bank

In millions of dollars equivalent; issues (+) or redemptions (−)

Amount of commitments January 31, 1978	February through April 30, 1978	Amount of commitments April 30, 1978
1,118.0	−123.4	994.6

Data are on a transaction-date basis.

which went so far as to induce actual liquidations of nonresident investments in their country. With the exchange rate for the German mark approaching $0.50 (DM 2.00 to the dollar), some traders feared that a clear breach of that level would lead to the broader use of exchange controls or of protectionist measures to contain the flow out of dollars. To the extent that such measures might trigger a snap back in dollar rates, some dealers were hesitant to take on new short positions at those levels and a few moved to cover short positions taken earlier. Consequently, although the mark rate rose briefly above $0.50 in early March, it soon settled back without intervention by the Federal Reserve.

During March, some of the market's more basic concerns began to ease. Once the coal strike was settled and the weather improved, the United States economy showed signs of renewed vigor. Following his confirmation as Chairman of the Federal Reserve Board, Mr. Miller argued that in view of the economy's underlying strength the focus of economic policy should be shifted toward curbing inflation. Moreover, both President Carter and Chancellor Schmidt indicated that new consultations on economic and financial policy were under way between the two governments. With this sense of movement on the policy front, some bidding for dollars emerged.

On March 13, following their discussions, the United States and German authorities issued a joint statement. Among the elements of agreement, both sides reaffirmed that continuing forceful action would be taken to counter disorderly conditions in the exchange markets and that close cooperation to that purpose would be maintained. The swap line between the Federal Reserve and the Bundesbank was doubled to $4 billion. Moreover, the United States Treasury announced that it was prepared to sell $730 million equivalent of special drawing rights (SDRs) to Germany and, if necessary, to draw on its reserve position at the International Monetary Fund to acquire currencies which might be needed for intervention. Some dealers had anticipated more far-reaching provisions, however, and immediately following release of the statement the dollar came under a heavy burst of selling pressure. On that day and the next, this Bank, in coordination with the Bundesbank, again intervened forcibly selling a further $372 million equivalent of marks financed through equal swap drawings by the System and the Treasury. Once the initial reaction passed, however, the market came into better balance.

Toward the month end the dollar briefly came under pressure following announcement of a record $4.5 billion United States trade deficit for February and in the backwash of heavy flows into the Japanese yen. The New York Federal Reserve Bank intervened on two days, selling a total of $120.2 million of marks. Of that total, $98.7 million equivalent was financed by equal drawings by the System and the Treasury on swap lines with the Bundesbank and the rest came from balances. The swap drawings raised the combined mark indebtedness of the United States authorities to a peak of $2,844 million equivalent, of which $1,844 million equivalent was drawn by the Federal Reserve and $1,000 million equivalent by the Treasury.

In April, further policy developments in the United States helped generate a better tone for the dollar. President Carter announced a series of proposals against inflation and pressed the Congress to move ahead on energy legislation. For its part, the Congress scrapped some legislative items which were considered particularly inflationary and intensified its efforts toward a compromise on the energy bill. Also, as data on the monetary aggregates came in very strong, the Federal Reserve shifted to a less accommodative stance in the domestic money market, leading to a firming of interest rates. Both the exchange market and the United States stock market reacted favorably to these changes. The United States Treasury's announcement of its intention to sell gold in a series of monthly public auctions beginning in May was also well received. In all, by end-April, the dollar had moved well away from its lows against most major currencies, rising by 4 percent against the German mark.

With the markets generally more orderly and the dollar now more resilient to selling pressures, central bank intervention tapered off. The Federal Reserve Bank of New York intervened on only one further occasion in April, selling $3.9 million equivalent of marks out of balances on April 27. Otherwise, the Federal Reserve and the Treasury purchased mark balances from correspondents and in the market to begin to liquidate swap debt. By April 30, the Federal Reserve had repaid $136.1 million of drawings, reducing the amount outstanding to $1,707.8 million equivalent, and the Treasury had repaid $88.9 million equivalent, cutting its debt to $911.1 million of marks.

In addition, the Federal Reserve and the United States Treasury continued with the program agreed to in October 1976 for an orderly repayment of pre-August 1971 franc-denominated liabilities still outstanding with the Swiss National Bank. The Federal Reserve liquidated $88.2 million equivalent of special swap debt with the Swiss central bank, leaving $381.9 million equivalent of indebtedness still outstanding as of April 30. These repayments were financed with francs purchased directly from the Swiss National Bank mainly against dollars, but also against marks and French francs. The United States Treasury's Ex-

change Stabilization Fund used Swiss francs purchased directly from the Swiss central bank to repay $123.4 million equivalent of franc-denominated securities, leaving $994.6 million equivalent of these obligations still outstanding as of April 30.

* * * *

From time to time in public discussions and academic literature reference has been made to foreign exchange profits and losses of the Federal Reserve and the United States Treasury. The Federal Reserve reports its realized net foreign exchange profits each year as part of its annual statement of earnings and expenses. The Exchange Stabilization Fund, which handles the foreign exchange operations of the United States Treasury, reports its net earnings on a quarterly basis, in the *Treasury Bulletin.* Table 6 recapitulates figures on realized gains and losses on an annual basis from 1961, when the United States authorities resumed foreign exchange operations.

For the period 1961-70, a single figure is given for each institution, reflecting profits or losses arising from operations undertaken at the time. For 1971 to date,

Table 6

Net Profits (+) and Losses (−) on United States Treasury and Federal Reserve Foreign Exchange Operations

In millions of dollars

Year	Net profits (+) and losses (−)	
	Federal Reserve	Exchange Stabilization Fund
1961		+ 0.2
1962	+ 0.3	+ 1.5
1963	+ 0.3	+ 0.9
1964	+ 0.1	− 0.1
1965	+ 1.0	+ 3.5
1966	+ 1.4	+ 3.2
1967	+ 1.3	+ 1.5
1968	+ 8.1	+ 2.2
1969	+ 6.4	− 1.0
1970	+ 3.0	−20.7
Total 1961-70	+21.9	− 8.8

Year	Net profits (+) and losses (−) related to current operations		Net profits (+) and losses (−) on liquidations of foreign currency debts outstanding as of August 15, 1971	
	Federal Reserve	Exchange Stabilization Fund	Federal Reserve	Exchange Stabilization Fund
1971	+ 3.7	+ 3.7	− 11.9	+ 14.1
1972	+ 1.4		− 54.5	−160.3*
1973	+ 1.3		− 47.5	−231.5*
1974	+ 4.1		− 37.7	− 11.6*
1975	+ 8.0		−250.2†	− 0.1*
1976	+ 6.2		− 34.0	− 13.8
1977	+ 4.6		−148.2	−113.0
Total 1971-77	+29.3	+ 3.7	−583.9	−516.2
January-April 1978	− 8.1	− 2.8	− 77.5	−107.5

Because of rounding, figures may not add to totals. The net profits and losses for the Federal Reserve are on a calendar-year basis. These figures may differ slightly from data reported in the Federal Reserve Board annual reports, in which net profits and losses realized in the last days of some years were reflected in the Income Statement for the following year.

* Indicated net losses reflect revaluations of foreign currency liabilities to take account of the two dollar devaluations, except for $84.5 million in 1972 and $61.6 million in 1973 which were realized on repayments of debts.

† Of which $250.0 million reflects revaluations of foreign currency liabilities to take account of the two devaluations of the dollar.

the figures on current operations are shown separately from those on liquidations of foreign currency debts outstanding as of August 15, 1971, when the United States suspended convertibility of the United States dollar into gold. Although current exchange market operations in recent years have continued to yield net profits, intervention by the United States authorities has been conducted with the objective of countering disorderly conditions in the exchange market, not of aiming for profits. Indeed, the experience has been that in the first instance, when the dollar is declining in a one-way market, swap debt mounts and the United States authorities face possible losses on outstanding swap contracts. But once the market settles down and positions in the market are unwound, the dollar rates rise, providing the opportunity for the United States authorities to cover their debt at a reduced loss or even a profit. As a matter of policy, however, the United States authorities have chosen to repay debt as quickly as market conditions permit so as to maintain the short-term nature of the swap facilities rather than to wait for profits. The swap repayments in late April were at a loss, which is reflected in the figures for January-April 1978.

With respect to the net losses on foreign currency debt outstanding as of August 15, 1971, it must be remembered that the debt was incurred under a regime in which officially held dollars were convertible into gold, held by the United States Treasury. These financing techniques were among the many adopted by major countries to reduce the use of gold while providing the holder of the debt with protection against exchange risk. After the suspension of dollar convertibility in 1971, the dollar was formally devalued twice, in 1972 and 1973, and was floated in 1973. As recounted in this series of reports on Treasury and Federal Reserve operations, the debt has been repaid by a variety of means, but in fulfilling the contractual responsibility on exchange risk the United States authorities have absorbed the losses set forth in the table. To the extent that the United States gold stock was in fact conserved by the original operations, the increase in value of that gold at current market prices would be well in excess of the losses actually taken.

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