



A BUSINESS AND FINANCIAL REVIEW BY THE FEDERAL RESERVE BANK OF CHICAGO

May/June 1979

ISSN 0164 - 0682

**ECONOMIC**

# PERSPECTIVES

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May/June 1979, Volume III, Issue 3  
**ECONOMIC PERSPECTIVES**

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# Subsidized housing—costs and benefits

William R. Sayre

Federal money has been used for more than 40 years to help a growing number of American families obtain better housing than they could otherwise afford. Now, more than 3 million of the country's 76 million households benefit from housing subsidies that total \$4 billion a year. Ten years ago, 800,000 households benefited from programs that cost \$400 million a year.

Housing subsidies expand as fast as federal funds are made available. Maybe as many as 30 million households—two out of every five—are eligible under existing programs for assistance in meeting housing costs. If fully funded, these programs could cost more than \$50 billion a year.

Housing subsidies have been provided under a bewildering variety of programs, most of which are more or less still active. The first major program, authorized in 1937 and still the largest, was low-rent public housing. Rent supplements, loan guaranties, and interest rate subsidies for rental and owner-occupied units have all been tried in various forms.

The fastest growing program today is "Section 8." Under this program, as much as 90 percent of the rent of a high-grade apartment can be paid by the government.

All the housing programs have been attacked at some time or other for high costs and mismanagement. In some areas, units have deteriorated from abuse or neglect to the point that rehabilitation has been impracticable. In other areas, programs have worked reasonably well.

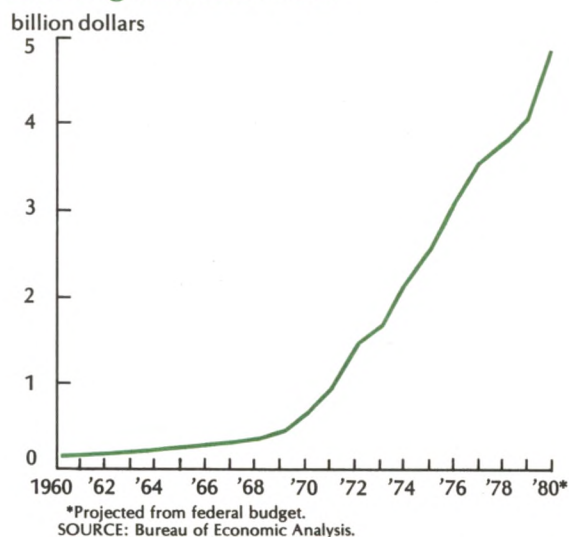
Problems in subsidized housing have brought reforms, modifications to programs, and new approaches. But Congress has con-

tinued to cite the objective enunciated in 1949—"a decent home and a suitable living environment for every American family."

## Public housing—a noble experiment

More than 1.1 million households are quartered in public housing projects—9,000 of them. The first projects were started in the late 1930s. From 1939 to 1942, some 270,000 units were built. After a lull during the Second World War, when federal attention shifted to defense housing, the program picked up again. New authorizations continued until January 1973, when operating problems brought a moratorium on new public housing projects as well as other subsidized programs beset with similar failings. When authori-

## Federal outlays for housing subsidies soar



zations were resumed in 1974, the public housing program had been scaled down and guidelines had been revised.

Public housing projects are owned and operated by local housing authorities (LHAs) set up by state and local governments. Federal assistance was limited originally to “annual contributions” to pay debt service charges on bonds and notes issued by LHAs to finance construction. These contributions eventually were supplemented by additional subsidies to help cover the costs of operating projects.

Because returns on securities issued by LHAs are exempt from federal income taxes and the securities themselves are guaranteed by the federal government, interest rates on notes and bonds issued by LHAs are low. New issues by groups of housing authorities are periodically offered at auction under HUD auspices. About \$14 billion of these securities are now outstanding. The federal government contributes about \$1.2 billion a year to service this debt.

Public housing is intended to provide suitable quarters for households too poor to pay the full market cost. Eligibility for public housing is determined by individual LHAs under federal guidelines.

Eligibility in the 1930s was limited to families with incomes no more than five times the rent, including utilities. Income was defined as gross cash receipts, less nonrecurring income, with allowances for the number of people in the family and large medical expenses.

Because rents were expected to cover operating costs, families with very low incomes were generally excluded. As a result, most tenants were the “working poor,” households with at least one member employed, but at a low wage.

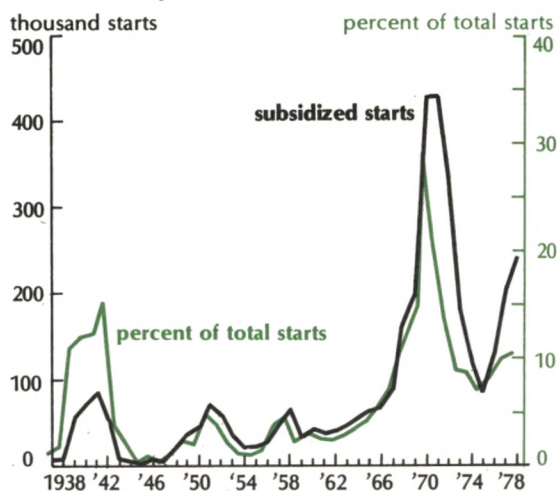
After the Second World War, Congress asserted the principle that public housing should be available to people that could not rent adequate private housing, no matter how low their incomes. With changes in the program made in the 1960s, more and more tenants were elderly, disabled, and chronically unemployed. Many were families headed by welfare mothers.

## Problems multiply

The President’s Committee on Urban Housing reported in 1968 that millions of families were too poor to pay even the low rents charged for public housing. Many tenants were said to be paying more than half their incomes in rent. To hold down rent increases many local housing authorities were delaying repairs and cutting back on maintenance. As a result, the National Housing Act was amended the next year to provide additional federal subsidies to help meet operating costs of projects, provided LHAs held rents to 25 percent of tenants’ incomes. These operating subsidies have risen from \$31 million in fiscal 1970 to \$280 million in fiscal 1973 and to almost \$700 million in 1979.

Meanwhile, tenants in public housing projects have been plagued increasingly with vandalism, assaults, and robberies. Problems have been especially severe in high-rise elevator buildings built on redeveloped land in inner cities. Conditions have become so bad in some projects that vacancies have soared despite the low rents. Some structures have become uninhabitable and been demolished.

## New subsidized housing remains well below the level reached in the early 1970s



To ease some of the problems in public housing, several policy changes were made in 1974. Most new projects since then have been smaller, lower, and scattered through more neighborhoods. Some 11,000 of these new units were started in 1978, and 25,000 are due to be started in fiscal 1979.

Basic problems still remain, however. Many buildings are still poorly maintained, overcrowded, and dangerous. Last year, according to HUD, 400 projects were in serious financial trouble. Operating costs—especially fuel, utilities, and maintenance—continued to outrun rents. Public housing seems to have become a permanent part of the housing subsidy picture. Any future expansion, however, is apt to be modest. Emphasis has shifted to subsidizing tenants in buildings privately owned and managed.

### **Subsidies for home ownership**

As problems of public housing became more evident in the 1960s, support grew for other types of subsidies, including programs to encourage home ownership. Problems of inadequate maintenance and vandalism, it was argued, would be reduced if underprivileged families could acquire equity interests in their shelter.

Section 235 of the Housing Act of 1968 inaugurated interest-rate subsidies combined with FHA insurance to help lower income families obtain mortgage loans. Subsidies initially reduced annual interest costs to as little as 1 percent, provided the families used at least 20 percent of their incomes for mortgage amortization payments, insurance, and taxes. They did not include the cost of maintenance and utilities, which were also the responsibility of the owners.

To be eligible for this subsidy, a family could not have an income that was over 35 percent more than the income that would make them eligible for public housing. Downpayments were nominal, as low as \$200. This was against the downpayments of 10 to 20 percent required for conventional loans.

Subsidized home ownership under Section 235 was pushed rapidly. From 1968

through 1972, about 400,000 new and existing homes had been purchased under the program. Most of the new owners, however, had no experience with owning real estate, and many had never before lived in a single-family home equipped with modern facilities.

It was apparent by 1972 that the Section 235 program was in trouble. Investigations showed widespread mismanagement and fraud. Many homes, especially older homes that had been rehabilitated, had substantial defects that had been deliberately concealed. Appraisals were often inflated, intentionally or through ignorance. Buyers found themselves with mortgages that substantially exceeded market value of the property and monthly payments that were too heavy. Many houses were not maintained. Some houses were abandoned, as owners with little or no equity interest in their houses took the easy way out from untenable financial arrangements. Left vacant, houses were often vandalized.

New authorizations under Section 235 were suspended in January 1973. But HUD has not given up on the subsidized home ownership program. Section 235 was revised in 1975. And to prevent a recurrence of earlier problems, inspection procedures were tightened, minimum downpayments were raised, and maximum subsidies were reduced.

The upper limit on family income was raised to 95 percent of the area median. To prevent concentration, no more than 40 percent of the houses in a subdivision could be subsidized. Purchases of existing homes could be approved only if they were thoroughly rehabilitated.

About 15,000 single-family homes are expected to be started under Section 235 this year. That will be about twice as many as last year but not nearly as many as supporters of the program would like to see and only a tiny fraction of the number of families eligible for this subsidy.

Several factors other than the limits imposed on the size of the program have limited activity. One is interest rates. The maximum subsidy now reduces effective interest cost to

the homeowner to 4 percent, instead of 1 percent, and that is not enough to help many lower-income families. Another is the downpayment. Now 3 percent of the purchase price, the downpayment eliminates some buyers. Most important, however, is the mortgage limit. At \$38,000 for a three-bedroom home, even the largest mortgage is not enough to finance many homes that would qualify at current prices.

### **Section 502 for rural homes**

Section 235 had a forerunner in Section 502 of the Housing Act of 1949. Designed to help rural families, Section 502 is administered by the Farmers Home Administration (FmHA). The program provided assistance originally only for isolated farmers, but borrowers in rural towns (not in metropolitan areas) as large as 20,000 can now qualify for FmHA loans.

Under this program, FmHA makes loans directly to homeowners and then sells the mortgages to investors, currently the Federal Financing Bank. FmHA insures and services the loans to low and moderate-income families. Low income is defined as up to \$11,200 a year. Moderate is \$11,200 to \$15,600.

Adjusted from time to time, statutory interest rates are currently 9 percent, which is well below the market rate. Low-income families can receive subsidies called "interest credits" to bring effective interest rates down to as little as 1 percent, the objective, as with Section 235, being to keep housing costs to within 20 percent of income.

Altogether, more than 850,000 loans have been made under Section 502. That is about twice as many as under Section 235. About 20 percent of the Section 502 loans were delinquent in 1978. That is compared with delinquencies of 1 or 2 percent on conventional loans made by S&Ls. (FmHA does not publish information on foreclosure rates.) Despite high delinquencies, the 502 program has not come under the same critical fire as Section 235, however. Along with other subsidy programs, the 502 program was suspended for a while in 1973, but it has since picked up vigorously again.

### **Aid to private apartments**

The federal government has provided rental supplements for almost 15 years to help the poor, elderly, and disabled rent suitable housing units. A major effort was launched through Section 236 of the Housing Act of 1968, providing subsidies for privately owned apartment buildings. More than 400,000 new units have been built under this program, and 50,000 existing units have been rehabilitated.

Subsidies to apartment owners can reduce interest costs to as little as 1 percent. As with Section 235 of the same act, eligibility was restricted to families with adjusted incomes not exceeding the local limits for public housing by more than 35 percent. Subsidized tenants must pay at least 25 percent of their incomes in rent. If rent in a building is more than that, tenants may be eligible for rental subsidies under other programs.

Again as with Section 235, under pressure to get moving with Section 236, officials allowed many irregularities that later plagued the program. Reports have charged inaccurate projections of cost and revenue, shoddy construction, mismanagement, and fraud. And like public housing, 236 projects have suffered vandalism.

More than 100,000 units were started under this program in both 1970 and 1971. Authorizations slowed in 1972, however, as investigations turned up problems. And the general moratorium placed on subsidized housing programs in early 1973 was never lifted from the Section 236 program.

Some 14 percent of the Section 236 mortgages have been foreclosed. And the financial situations of many other projects are reported to be precarious. Most of the failures have been in projects operated by nonprofit organizations or cooperatives, usually without experienced managers in charge. Even when grosser problems have been kept in check, operating costs have continued to rise faster than tenant incomes.

To prevent more failures, large sums have been used from other federal programs to support Section 236 projects. Outlays on these projects in fiscal 1978 totaled about \$800

million. That included \$600 million under Section 236, \$100 million under rent supplements, and \$100 million under Section 8.

### Section 8—the chosen instrument

The newest, fastest growing federal housing subsidy program is styled Section 8, an amendment to the 1937 Housing Act. Enacted in 1974 after the unsatisfactory results of other programs had been examined at length, Section 8 provides subsidies for tenants in buildings, new or existing, that often are owned and financed privately.

Activity under Section 8 built slowly through 1976, but has since picked up. By the end of 1978, more than 660,000 households were receiving subsidies under this program. Of these, 580,000 were renting previously existing units. In many cases, tenants continued to live in the units they occupied before they were covered by Section 8.

Renters under Section 8 pay no more than 25 percent of their incomes in rent. Certified landlords are paid “fair market rents” determined by annual HUD surveys. HUD pays the subsidy—the difference between tenant payments and the fair market rent—directly to the landlord.

HUD-determined fair market rents are intended to approximate the rent (including utilities) on comparable private apartments. The apartments must be of modest design and meet HUD standards.

What are considered fair market rents vary with size, location, and age of the apartment. HUD adjusts rent allowances annually to reflect changes in property taxes, insurance premiums, utility costs, maintenance charges, and other operating expenses. The allowable rent for new two-bedroom elevator apartments varied last year from \$262 a month in Salt Lake City, to \$435 in Chicago, to \$631 in San Francisco. The allowance for a four-bedroom unit in New York could be well over \$800.

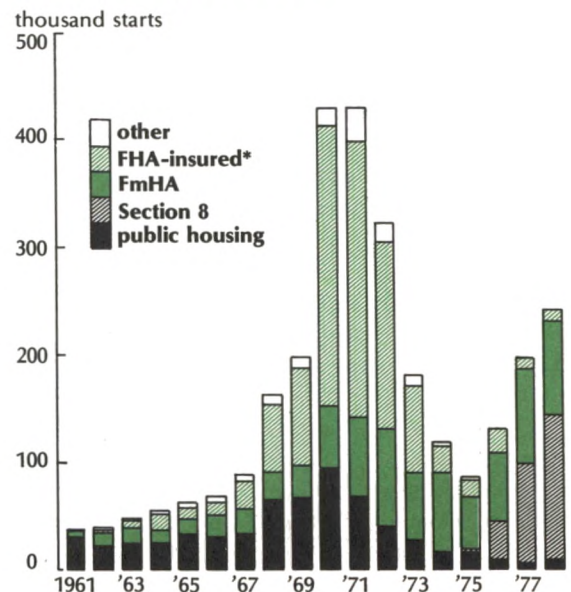
A family may be eligible for Section 8 assistance if its income, adjusted for family size, is no higher than 80 percent of the area

median. Theoretically then, 40 percent of the families in an area are eligible for assistance. Thirty percent of the units in new buildings subsidized under Section 8 must be set aside for families with very low incomes. Defined as incomes up to 50 percent of the area median, “very low income” describes a fourth of the families in an area.

Families seeking Section 8 assistance must apply to their local LHA. As the number of families that can be certified is limited by the availability of funds, waiting lists are long. Once certified, however, a family can use its subsidy to lease any apartment in the LHA jurisdiction, provided the rent is no more than what HUD has set as the fair market rent. About half the certificate holders remain in the apartments they were in when they were certified. For these families, the subsidy is equivalent to an unrestricted income supplement.

Unlike previous rent subsidy programs, Section 8 does not limit assistance for building new units to any particular type of ownership or financing. Section 8 projects can be owned by public agencies or private individuals.

### Upswing in subsidized housing starts led by Section 8



\*Mainly Section 235 and Section 236 starting in 1969.

Financing can involve tax-exempt bonds issued by state housing finance agencies, below-market federal loans, GNMA tandem securities, or conventional loans with mortgage insurance from either FHA or private insurers.

Of the 300,000 Section 8 units started since 1975, about a third have been financed by state housing finance agencies that can issue tax-exempt bonds and lend the proceeds for Section 8 construction—at below-market rates. Another 50,000 Section 8 starts have received subsidized financing through a Government National Mortgage Association (GNMA) “tandem plan.” Under the tandem plan, GNMA buys FHA-insured Section 8 loans made at below-market rates and sells the loans at market yields, absorbing the loss as a subsidy. About 25,000 Section 8 starts have been financed by HUD with Section 202 loans for multifamily housing for the elderly and disabled. The interest rate on Section 202 loans is set slightly above the average yield on outstanding Treasury obligations.

New Section 8 projects take longer to build than comparable private projects. This is because developers have to comply with a variety of government regulations that have much less effect on most private projects. These include environmental impact evaluations, local zoning approvals, federally approved wage scales, equal employment opportunity rules, and HUD minimum property standards. Time spent documenting compliance and waiting for approval adds to construction costs, discouraging some developers from undertaking Section 8 projects.

Operating costs also tend to be higher in Section 8 projects than in private projects. Like public housing projects, Section 8 projects have incurred additional expenses for budget counseling, day-care centers, special facilities for the elderly and handicapped, certification of tenant incomes, and additional maintenance.

To compensate for the extra expense of Section 8 construction and operations, HUD allows the rent in some projects to go up to 20 percent higher than what it has considered

fair market rent. Units that are vacant earn subsidies of 80 percent of full rent for up to 60 days. After that, the debt service attributed to a vacant unit can be subsidized for up to a year.

Some developers try to attract investors to proposed Section 8 projects by emphasizing favorable provisions in the tax code relating to the construction of subsidized rental units. Interest and taxes can be written off during construction, and rules for recapturing excess depreciation are not as strict for subsidized buildings as for buildings that are not subsidized.

### **Some Section 8 problems**

Construction and operation of new Section 8 projects involve risks for both HUD and the developers. The determination of fair market rents, for example, is very tricky. These are ceiling rents. If they are too high, there is more potential for waste and abuse. If they are too low, either projects will not be undertaken or operating losses can develop, leading to deferred repairs and maintenance.

Although what was fair as rent may have been properly determined when a project was built, subsequent increases may have been excessive or they may not have been enough to cover the rise in operating costs. Some potential investors in Section 8 projects are afraid the program might fall from favor and that annual increases might be limited or deferred. The results, they fear, could be large deficits and failures, such as those in many public housing and Section 236 projects in the early 1970s.

Subsidies for vacant units are hard to administer. To be eligible for the subsidy, developers must accept any eligible applicants, a requirement that may limit an operator's ability to attract and hold good tenants. A project could attract an influx of undesirable tenants, such as vandals and drug addicts. The operator's prerogatives in evicting undesirable tenants is limited because evictions must be approved by the LHAs.

Questions have been raised about the distribution of Section 8 subsidies.



### Subsidized Housing Programs (1978)

	Housing units occupied	Average annual subsidy	Average annual household income
<b>Rental subsidies</b>			
Public housing	1,173,000	\$1,530	\$4,640
Rent supplement	172,000	1,370	3,870
Section 236	545,000	1,140	6,330
<b>Section 8</b>			
New construction	85,000	3,000	4,400
Existing housing	581,000	1,340	3,940
<b>Homeownership subsidies</b>			
<b>Section 235</b>			
Original	250,000	350	8,150
Revised	12,000	970	12,330
FmHA Section 502	854,000	n.a.	10,020

Differences in market rents often reflect differences in location, for example, with the result that families in more desirable locations can receive larger subsidies than families with the same income in less desirable locations. Families moving into new apartments can receive larger subsidies than families in used apartments. And subsidized families can be living in more expensive apartments than families that do not receive subsidies—even many middle-income families.

Long waiting lists for eligibility for Section 8 subsidies reflect both the limited funds available for Section 8 and the liberal income standards. Millions of households paying their own way have incomes less than 80 percent of the area median. Provision of funds for expansion of the program to all eligible households would involve enormous cost. Outlays exceeded \$800 million in fiscal 1978 and are expected to exceed \$1.3 billion in fiscal 1979. But even that will be only a small fraction of potential outlays.

A typical new unit built with Section 8 assistance rented for about \$4,000 in 1978. This unit was occupied by a family with an income of about \$4,400. The family paid about \$90 a month in rent and received a subsidy of \$240, or \$2,900 a year. In New York, where fair market rents were as high as \$800 a month, a family with an income of \$4,400 could receive a subsidy of \$710, or \$8,500 a year.

Under current rules, 40 percent of the country's 76 million households are potentially eligible. If every eligible household received a subsidy of \$100 a month, the cost would exceed \$35 billion a year. At \$200 per month, the cost would be \$70 billion. To put these figures in perspective, consumer spending on rent (including the implicit rent on owner-occupied homes) was about \$200 billion in 1978.

### Subsidies in perspective

Federally provided housing subsidies are just one of many types of income support available for lower-income families—including many families well above the poverty level. These supports consist of subsidies for medical care, food, utility bills, and cash payments that can be spent as the recipient chooses.

Other subsidies available to families of all income groups include, for example, public education and public transportation. As home owners are not required to pay taxes on the imputed rental value of their homes, even the deduction of interest and property taxes for income tax purposes can be viewed as a form of subsidy.

The 40-year record of federal housing subsidies has been marked with great difficulties and many sorry failures. But the principle of decent, affordable housing for all households is firmly entrenched as national policy. These subsidy programs have powerful political support, not only from those that want to help the poor, but also from the building industry, construction unions, promoters, and financial institutions.

Housing subsidies have undoubtedly greatly improved the living standards of many families, with resulting benefits in a healthier, more stable environment. Unfortunately, however, these vast programs, removed from the discipline of the free market, place a heavy strain on the administrators responsible for maintaining equity, integrity, and cost-effectiveness.

# Midwest—leading export region

Jack L. Hervey

Exports from the United States continue to increase. They totaled \$140 billion last year, and this year they are running at an annual rate of \$165 billion.

In dollar terms, exports have expanded sevenfold since 1960. Much of the increase is due to inflation. But there has also been a marked increase in real terms—an expansion by nearly three times since 1960.

As a proportion of the country's production of goods, exports have more than doubled, advancing from 7.5 percent in 1960 to 15.4 percent in 1978.<sup>1</sup> Most of this increase has occurred since 1970.

Shipments from states of the Seventh Federal Reserve District—Illinois, Indiana, Iowa, Michigan, and Wisconsin—have contributed substantially to this increase.

## Agricultural exports

The United States is the world's largest exporter of agricultural commodities, and U.S. shipments of farm commodities also make up a large part of the nation's total exports. Agricultural shipments accounted for 20 percent of the U.S. goods exported in 1977 and about 21 percent in 1978. The agricultural share of exports in 1970 was about 17 percent.

<sup>1</sup>Exports of merchandise as a percentage of the output of goods (final sales of durable and nondurable goods adjusted for changes in business inventories) provides a measure of the importance of exports to the economy. Output makes a better base for this measure than the commonly used gross national product (GNP). Output excludes from the base services and construction, sectors that while accounting for more than half of GNP, do not enter into merchandise exports. The output of goods accounted for only 44 percent of GNP in 1978, compared with 50 percent in 1960. The use of GNP, on the other hand, as a base for measuring the dependence of the country's producers and consumers on imports is more meaningful than output, since it reflects the proportion of total income going into imports.

Agricultural production for export is fairly well concentrated, and the concentration is increasing. Ten states produced 61 percent of the value of U.S. farm exports in 1978. That compared with 56 percent in 1968.<sup>2</sup>

Illinois and Iowa ranked first and second in the value of farm exports in 1978. Indiana ranked sixth. Together, these three district states produced 23 percent of the dollar value of farm exports in 1978. With Michigan and Wisconsin, the five-state district area pro-

Ranking of major agricultural exporting states (fiscal 1968 and 1978)

State	1978			1968		
	Exports (million dollars)	Percent of total	Rank	Exports (million dollars)	Percent of total	Rank
Illinois	\$ 2,770	10.1	1	\$ 585	9.3	1
Iowa	2,115	7.7	2	392	6.2	4
Texas	2,074	7.6	3	551	8.7	2
California	1,927	7.1	4	413	6.5	3
Minnesota	1,485	5.4	5	226	3.6	10
Indiana	1,408	5.2	6	251	4.0	8
Kansas	1,360	5.0	7	296	4.7	6
Nebraska	1,332	4.9	8	229	3.6	9
Missouri	1,069	3.9	9	174 <sup>1</sup>	2.8	12
Ohio	1,056	3.9	10	194 <sup>1</sup>	3.1	11
Ten largest exporting states	16,595	60.8	—	3,564 <sup>1</sup>	56.4 <sup>1</sup>	—
Seventh District states	7,167	26.3	—	1,380	21.9	—
U.S. total	27,298	100.0	—	6,315	100.0	—

<sup>1</sup>In 1968, North Carolina ranked fifth with estimated export shipments of \$366 million (5.8 percent of the U.S. total). Arkansas ranked seventh with estimated export shipments of \$255 million (4.0 percent of the U.S. total). North Carolina and Arkansas data are included in "ten largest" total in place of Missouri and Ohio data.

SOURCE: Department of Agriculture.

<sup>2</sup>Agriculture exports cannot be identified by state of origin. Farm commodities are mixed as they move along the marketing chain, some shipments going to markets at home, others abroad. In estimating a state's export of a commodity, the USDA multiplies the proportion of the crop grown in that state by the dollar value of the commodity exported during that period. The result is export figures that represent state shares of the exports of various commodities. It makes little difference how much of the production from a particular state is actually consumed in foreign or domestic markets. The strength of export demand affects all producers, regardless of where their crops are finally consumed.

duced 26 percent, some four percentage points more than in 1968.

The increased importance of district states as a source of agricultural exports has been due mainly to changes in foreign demand for U.S. farm commodities.<sup>3</sup> Foreign demand for feed grains and soybeans has increased in recent years, making these commodities important relative to total agricultural exports.

Exports of feed grains reached a near-record \$5.9 billion in 1978 to account for about a fifth of all exports of U.S. produced farm commodities. Though down slightly from export shares of the previous three years, feed grain exports were up in both value and export share from the late 1960s and early 1970s. In 1968, for example, the value of U.S. feed grain exports totaled \$923 million. As a share of all agricultural exports that year, feed grain shipments were about 15 percent.

Exports of soybeans—and to some extent, other oil seeds—have increased similarly. Exports of soybeans rose from \$810 million in 1968 to \$5.2 billion in 1978. That was an increase from 13 percent of all farm exports to nearly 18 percent.

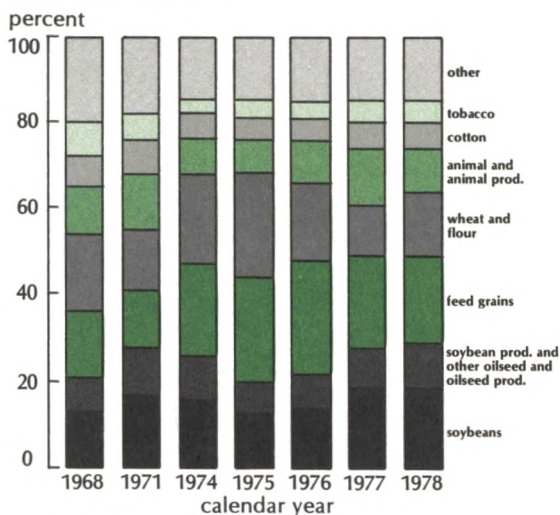
The disproportionately rapid growth in exports of feed grains and soybeans resulted from Japan, Western Europe, the Soviet Union—and some developing countries—increasing the protein content of their diets either directly through consumption of high-protein oilseed products or indirectly through expanded production of livestock.

The growth in demand for U.S. farm commodities came, then, from increases in income in these importing countries and tendencies of people to increase their intake of protein, especially meat, when basic dietary requirements have been met.

As farmers in the Seventh District are major producers of feed grains and oil seeds, these shifts in demand overseas have increased the relative importance of district

<sup>3</sup>Measured in terms of cash receipts from farm marketings nationwide, the proportion of agricultural production accounted for by Seventh District states has varied little since the mid-1960s. Farmers in these five states accounted for 22.3 percent of the cash receipts in 1965, 21.7 percent in 1970, and 22.5 percent in 1976.

## Composition of U.S. agricultural exports shifts toward soybeans and feed grains

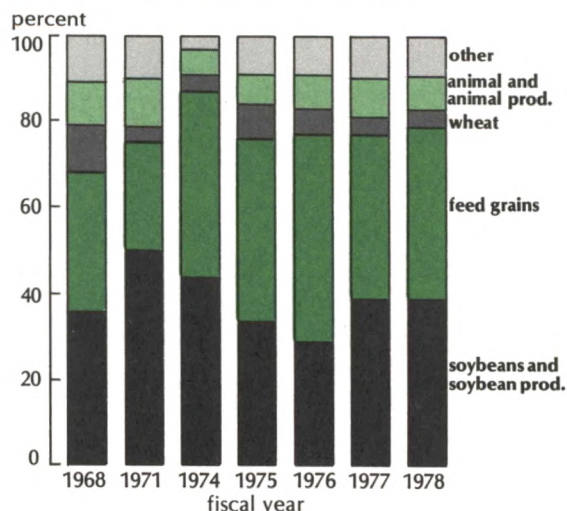


SOURCE: Department of Agriculture.

states as sources of agricultural exports. The five district states accounted for 48 percent of the feed grains produced for export in fiscal 1978 and 39 percent of the soybeans, oil seed, and protein meal products.

Within the district, feed grains and soybeans and soybean products account for

## Soybeans and feed grains make up large proportion of Seventh District agricultural exports



SOURCE: Department of Agriculture.

most of the agricultural production grown for export. (Soybeans are the only oil seeds of significance grown in the district.) More than three-quarters of the agricultural exports from district states were feed grains (mostly corn) and soybeans and soybean products. Feed grains accounted for 40 percent of the exports from the district, and soybeans and soybean products accounted for an additional 39 percent. Wheat, though a major export commodity for the country as a whole, is of little importance to production and exports in district states.

The importance of agricultural production to U.S. exports is only half the picture, however. The other half is the vital dependence of U.S. agriculture on the foreign demand for farm products. For the

**Agricultural exports as percent  
of cash receipts from farm  
marketings—major agricultural states  
(1978)<sup>1</sup>**

State	Cash receipts	Exports <sup>2</sup>	Percent
	<i>(million dollars)</i>		
Illinois	\$ 6,303	\$ 2,770	43.9
Iowa	8,209	2,115	25.8
Texas	7,307	2,074	28.4
California	10,393	1,927	18.5
Minnesota	4,894	1,485	30.3
Indiana	3,447	1,408	40.8
Kansas	4,249	1,360	32.0
Nebraska	4,608	1,332	28.9
Missouri	3,597	1,069	29.7
Ohio	3,068	1,056	34.4
Ten largest exporting states	56,075	16,595	29.6
Seventh District states	23,709	7,167	30.2
U.S. total	110,221	27,298	24.8

<sup>1</sup>The states' shares for exports are based on the fiscal year October 1, 1977, through September 30, 1978. Cash receipts from farm marketings are for calendar year 1978. Calendar year 1978 exports were somewhat greater than for the fiscal year—\$29.4 billion compared with \$27.3 billion, respectively. As a result, the "export share of cash receipts" in the table is somewhat understated. For the total U.S. where comparable time period data are available the "exports share of cash receipts" for calendar 1978 was 26.7 percent as compared to 24.8 percent reported in the table.

<sup>2</sup>The value of agricultural exports includes some dollar value added associated with transportation and processing.

SOURCE: Department of Agriculture.

country on the whole, it has been estimated that as much as a fourth of the cash receipts from marketing farm-produced commodities came from export markets in fiscal 1978. Because of the composition of agriculture in the Seventh District, these five states are especially dependent on foreign demand. About 30 percent of their receipts from farm marketings were derived from exports. Exports accounted for more than 40 percent of the receipts from farm marketings in Illinois and Indiana.

These figures could be overstated slightly because the value of agricultural exports includes some nonfarm value added, such as the costs of shipping and in some cases processing. Most of the agricultural exports produced in the district, however, contain comparatively little nonfarm value added because of the nature of the products.

### Output of manufactured goods

Most of the country's manufacturing is also concentrated geographically. An extensive transportation net, ready access to raw materials, and large concentrations of population have made the Seventh District and surrounding states the nation's industrial heartland. Of the ten largest manufacturing states in 1976, four were in the Midwest—three in the Seventh District.<sup>4</sup> Ohio ranked second, Illinois third, Michigan fourth, and Indiana ninth. These four states accounted for nearly a fourth of the manufactured goods shipped that year (shipments valued f.o.b. at the plant). The three top district states, along with Wisconsin, which ranked 11th, and Iowa, which ranked 17th, accounted for nearly 22 percent of the total value added in manufacturing and more than 22 percent of the dollar value of manufactured shipments.<sup>5</sup> The

<sup>4</sup>California, Ohio, Illinois, Michigan, Texas, New York, Pennsylvania, New Jersey, Indiana, and North Carolina.

<sup>5</sup>Value added refers to the incremental contribution to the dollar value of a product made in the district. Only where a product is manufactured totally within the district (from extraction of raw materials to the final product) does the value added equal the value of shipments.

largest ten manufacturing states accounted for 58 percent of the value added and 59 percent of the manufacturing shipments.

## Exports of manufactured goods

Foreign demand for U.S. manufactured goods has increased faster in recent years than domestic demand, boosting the proportion of manufactured goods shipped to export markets, from a national average of 4 percent in 1966 to 7 percent in 1976. The proportion of manufactured goods shipped abroad from the ten largest exporting states increased from 4.1 percent of total shipments of manufactured goods in 1966 to 7.5 percent in 1976. The increase from the five largest exporting states was even larger, from 3.1 percent to 7.7 percent. For states of the Seventh District, the increase was from 4.5 percent of total manufactured shipments to 7.6 percent.

The magnitude of the export market shows even more in data for individual states and industries. The data also show wide variations in the importance of exports as a source of demand for manufacturing output. The export share of shipments from the largest manufacturing states cluster around the national average. Michigan, for example, had 8.6 percent of its manufacturing shipments going into exports in 1976, com-

## Ranking of major manufacturing states (1966 and 1976)

State	1976			1966		
	Exports (million dollars)	Percent of total	Rank	Exports (million dollars)	Percent of total	Rank
California	\$ 8,072	9.7	1	\$ 1,786	8.4	3
Michigan	6,888	8.3	2	1,568	7.4	5
Illinois	6,660	8.0	3	1,869	8.8	1
Ohio	5,794	7.0	4	1,670	7.8	4
New York	5,320	6.4	5	1,838	8.6	2
Texas	5,201	6.3	6	1,100	5.2	7
Pennsylvania	4,706	5.7	7	1,542	7.2	6
Washington	3,235	3.9	8	602 <sup>1</sup>	2.8	11
Indiana	2,828	3.4	9	661	3.1	9
New Jersey	2,660	3.2	10	980	4.6	8
Ten largest exporting states	51,364	61.8	—	13,634 <sup>1</sup>	64.0 <sup>1</sup>	—
Seventh District states	20,085	24.2	—	5,055	23.7	—
U.S. total	83,098	100.0	—	21,299	100.0	—

<sup>1</sup>In 1966, Wisconsin ranked tenth with estimated exports of \$620 million (2.9 percent of the U.S. total). Wisconsin data are included in the "ten largest" total in place of Washington for that year. In 1976, Wisconsin ranked twelfth with estimated exports of \$2,209 million (2.7 percent of the U.S. total).

SOURCE: Department of Commerce.

pared with 7 percent for the nation. California had 7.9 percent, New York 7.0 percent, and New Jersey 5.8 percent.

Washington, on the other hand, though not a major manufacturing state, ranked eighth as an exporter of manufactured goods, with 17.2 percent of its shipments going into export channels. Especially important to manufacturing in Washington were exports of transportation equipment (reflecting the dominance of U.S.-made aircraft in world air transportation) and wood products. The largest proportion of manufacturing shipments going abroad, 23.5 percent, was from Alaska, a state with a narrow industrial base—mainly fisheries processing and lumber and wood products—and, largely because of its geographical separation from the contiguous states, comparatively little domestic demand for its products. The smallest, proportion, 1.2 percent, was shipped from Wyoming, also a state with a narrow industrial base, but one almost entirely oriented toward domestic consumption—foods and stone products.

The export share of a state's manufacturing shipments depends heavily on the mix of the industries in the state. The greater the concentration of the more export-oriented industries, the greater the dependence of production and employment on foreign markets.

## Manufacturing exports as percent of manufacturing shipments—major manufacturing states (calendar 1966 and 1976)

State	1976			1966		
	Shipments (million dollars f.o.b. plant)	Exports	Percent	Shipments (million dollars f.o.b. plant)	Exports	Percent
California	\$102,041	\$ 8,072	7.9	\$ 39,495	\$ 1,786	4.5
Michigan	80,327	6,888	8.6	40,558	1,568	3.9
Illinois	82,351	6,660	8.1	41,324	1,869	4.5
Ohio	83,599	5,794	6.9	41,645	1,670	4.0
New York	76,087	5,320	7.0	48,231	1,838	3.8
Texas	77,120	5,201	6.7	21,330	1,100	5.2
Pennsylvania	71,919	4,706	6.5	38,164	1,542	4.0
Washington	18,843	3,235	17.2	6,965	602 <sup>1</sup>	8.6
Indiana	45,181	2,828	6.3	21,647	661	3.1
New Jersey	45,711	2,660	5.8	24,941	980	3.9
Ten largest exporting states	683,279	51,364	7.5	332,554 <sup>1</sup>	13,634 <sup>1</sup>	4.1
Seventh District states	264,058	20,085	7.6	111,776	5,055	4.5
U.S. total	1,185,695	83,098	7.0	538,737	21,299	4.0

<sup>1</sup>In 1966, Wisconsin had an estimated \$620 million in exports (4.1 percent of manufacturing shipments by firms in the state). Wisconsin data are included in the "ten largest" total in place of Washington for that year. In 1976, Wisconsin had exports estimated at \$2,209 million (6.2 percent of manufacturing shipments).

SOURCE: Department of Commerce.

Industries depending most on exports are electrical and nonelectrical machinery and transportation equipment—a dependence that has increased substantially in recent years. In Illinois, for example, 25 percent of the nonelectrical equipment shipped in 1976 went into exports markets. That was compared with about 15 percent in 1966. In Indiana, about 11 percent of the nonelectrical machinery shipped in 1976 went into exports, compared with 8 percent in 1966. For states of the Seventh District taken together, the increase was from 11 percent in 1966 to about 19 percent in 1976. For the nation as a whole, the increase was from 10 percent in 1966 to 18 percent in 1976.

About 10 percent of the electrical machinery and transportation equipment produced in the Seventh District was exported in 1976. That was more than twice the export share of shipments in 1966.

Machinery, food processing and transportation equipment are the dominant types of manufacturing industries in the United States. Together, they accounted for more than two-fifths of the manufacturing shipments in 1976. In the Seventh District, they accounted for 56 percent. These industries are an even more dominant propor-

tion of U.S. exports. Nationwide they accounted for 61 percent of manufactured exports in 1976 and in the Seventh District they made up three-quarters of manufactured exports.

Even with the dominance of these industries, there is considerable variation in their importance from state to state. In Iowa, for example, more than 17 percent of the manufactured exports in 1976 were from food industries, 63 percent from machinery industries, and only 1 percent from transportation industries. Comparable figures for Michigan were 3 percent, 18 percent, and 52 percent and for Illinois 12 percent, 59 percent, and 6 percent.

### Exports and employment

Often lost in considerations of international trade is the importance of the export market to employment. Jobs lost to imports seem to get more play than jobs created by exports. It has been estimated that nearly 1.2 million jobs were related to the export of manufactured goods in 1976. That is a significant number of jobs by any measure.

The effects of exports on employment vary from state to state. Typically, the propor-

### Manufacturing shipments by industries (1976)

Share of manufactured shipments by state and by manufacturing category

Category	Illinois	Indiana	Michigan	Wisconsin	Iowa	Seventh	California	Ohio	New York	Total U.S.
						District				
(percent)										
Food	17.4	9.8	6.3	23.4	43.4	15.6	18.4	9.5	10.6	15.3
Chemicals	7.8	6.3	4.4	2.6	7.5	5.8	5.3	7.1	6.8	8.7
Primary metals	8.9	20.5	7.9	3.9	3.2	9.5	3.3	14.1	6.4	7.1
Fabricated metals	9.0	7.5	9.8	8.1	4.0	8.5	6.2	11.5	4.7	6.5
Machinery— nonelectrical	15.7	8.0	9.7	18.2	18.4	13.1	7.8	11.3	10.4	8.9
Machinery— electrical	9.2	12.3	2.1	5.8	6.2	6.9	8.5	6.8	8.7	6.1
Transportation equipment	4.8	14.7	46.7	12.7	2.9	20.1	15.9	16.3	5.6	11.6
Other	27.2	20.9	13.1	25.3	14.4	20.5	34.6	23.4	46.8	35.8
Total shipments	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Department of Commerce.

## Manufacturing exports by industries (1976)

Share of exports by state by manufacturing category

Category	Illinois	Indiana	Michigan	Wisconsin	Iowa	Seventh District	California	Ohio	New York	Total U.S.
	(percent)									
Food	11.7	4.5	2.6	5.5	17.5	7.3	8.9	4.9	1.9	7.1
Chemicals	6.7	10.6	6.1	2.4	5.6	6.5	6.0	5.7	9.0	11.1
Primary metals	2.8	7.2	9.5	7.2	1.6	5.4	1.4	4.2	3.2	3.2
Fabricated metals	3.6	3.9	6.9	5.0	3.1	4.9	3.3	7.7	4.2	4.4
Machinery— nonelectrical	48.6	14.5	14.7	49.5	49.7	32.4	18.9	25.6	25.5	22.9
Machinery— electrical	10.0	18.4	3.3	11.7	12.9	9.3	18.6	11.8	18.0	10.9
Transportation equipment	6.1	32.4	52.1	14.4	1.3	26.1	25.5	28.4	5.7	19.7
Other	11.5	8.5	4.8	4.3	8.3	8.1	17.4	11.7	32.5	20.7
Total exports	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Department of Commerce.

tion of manufacturing employment associated with exports is somewhat lower than the proportion of manufacturing that goes into exports. Of total manufacturing employment in 1976, 6.3 percent of the workers were associated with the export market. But of total manufacturing

shipments, 7.0 percent of those shipments went to the export market.

This indicates the mix of manufactured goods from the United States takes fewer workers for the dollar value of the production than goods manufactured for the home market. Put another way, the dollar value of

## Exports as a percentage of total manufacturing shipments by industry<sup>1</sup> (1976)

Category	Illinois	Indiana	Michigan	Wisconsin	Iowa	Seventh District	California	Ohio	New York	Total U.S.
	(percent)									
Food	5.4	2.9	3.5	1.4	2.9	3.6	3.8	3.6	1.3	3.2
Chemicals	6.9	10.6	11.9	5.6	5.4	8.5	9.0	5.5	9.3	8.9
Primary metals	2.5	2.2	10.2	1.2	3.6	4.3	3.3	2.1	3.5	3.2
Fabricated metals	3.2	3.2	6.1	3.8	5.6	4.4	4.3	4.6	6.2	4.8
Machinery— nonelectrical	25.1	11.4	13.0	17.0	19.5	18.8	19.1	15.7	17.2	18.1
Machinery— electrical	8.8	9.4	13.3	12.7	15.1	10.3	17.3	12.0	1.4	12.4
Transportation equipment	2.8	13.9	9.6	7.0	3.3	9.9	12.7	12.1	7.1	11.9
All exports	8.1	6.3	8.6	6.2	7.2	7.6	7.9	6.9	7.0	7.0

<sup>1</sup>Table interpretation: For the state of Illinois, for example, exports of nonelectrical machinery accounted for 25.1 percent of shipments of nonelectrical machinery manufactured in Illinois.

SOURCE: Department of Commerce.

goods made for export is higher, per worker, than goods made for domestic markets. Put still another way, labor productivity is higher for goods produced for exports than for the mix of goods produced for domestic consumption.

The value of export shipments per export-related worker in 1976 has been estimated at \$71,000. For domestic shipments, the figure was about \$63,000. Comparable figures for the ten largest exporting states were \$73,000 and \$65,000. The difference was even greater in states of the Seventh District. The per-worker value of output for export in the five-state area averaged \$79,000 in 1976, compared with a value of \$70,000 for domestic shipments. These figures indicate that the export demand was for higher valued goods than domestic demand, which covered a much wider value-array of goods.

Export demand for manufactured goods has become increasingly important for employment in recent years. In 1976, total employment in manufacturing was down about 6 percent from the level of the late 1960s. Employment in export-related manufacturing was up about 50 percent, however, increasing the proportion of manufacturing employment in export-related industries from about 4 percent in 1969 to more than 6 percent in 1976. Seventh District states and other major export industry states contributed significantly to the shift. More than half of the 400,000 new jobs created in export-related manufacturing between 1969 and 1976 were in the ten largest exporting states. About a sixth of the additional employment was in district states.

California, the leading manufacturing export state, had the largest number of workers in export-related manufacturing. Estimates show nearly 124,000 or 7.7 percent of the state's employment in export-related manufacturing.

Illinois, the third largest exporting state for manufacturers, was next with an estimate of nearly 87,000 employed in export-related manufacturing. That was 6.9 percent of the state's manufacturing employment.

Four other states, Ohio, New York, Penn-

### Estimated employment associated with exports as a percentage of manufacturing employment

State	Manufacturing employment		Export-related employment		Percent of total	
	1976	1969	1976	1969	1976	1969
	(thousands)		(thousands)			
Illinois	1,256	1,408	87	67	6.9	4.7
Michigan	1,050	1,169	74	59	7.0	5.0
Indiana	677	744	40	28	5.9	3.7
Wisconsin	520	524	32	23	6.2	4.4
Iowa	231	219	20	11	8.6	5.0
District total	3,734	4,063	253	187	6.8	4.6
Ten largest states <sup>1</sup>	10,436	11,825	702	499	6.7	4.2
U.S. total	18,753	20,037	1,173	779	6.3	3.9

<sup>1</sup>The states with the largest export values in 1976 and 1969 were: California, Michigan, Illinois, Ohio, New York, Texas, Pennsylvania, Washington, Indiana, and New Jersey.

Note: Figures for Seventh District states may not equal the total due to rounding.

SOURCE: Department of Commerce.

sylvania, and Michigan, had more than 70,000 in export-related manufacturing jobs.

Just as the importance of manufacturing exports relative to total manufacturing varies from state to state, so does the importance of export-related employment relative to total employment. In states with little manufacturing, exports and export-related employment tend to be of little consequence. In Montana and Wyoming, for example, where there is little manufacturing in the first place, less than 2 percent of manufacturing employment is related to exports. There are exceptions, however. In Alaska, where there is also little manufacturing, nearly 23 percent of the manufacturing employment is export related, mostly in the lumber and wood products industry. In Washington, ranking eighth among the exporting states though it does not count as one of the big manufacturing states, more than 12 percent of the manufacturing jobs in 1976 were in export industries, particularly in lumber and transportation.

### Conclusion

Exports are often seen as fairly unimportant to an economy with a GNP of more than \$2 trillion. Exports amount to significantly less than a tenth of GNP. Viewed in terms of the value of goods produced, however—excluding services and structures—exports take on new importance. They accounted for 15 percent of the output last year. And in the disaggregation of exports—their breakdown



by type of industry and location—they take on still more significance.

Sources of exports are not spread evenly across the country or across industries. Locations of export industries tend to be concentrated in only a few areas. Most of the exports tend to come from only a few industries.

Agricultural exports account for about a fifth of the U.S. total, but most of these exports come from comparatively few states, including states of the Seventh District. In addition, agricultural exports make up a large part of the cash receipts from farm marketings in some states, which again include those in the Seventh District.

Manufacturing for export is also heavily concentrated. Comparatively few states—and comparatively few industries—make significant contributions to the export total. As a result, industrial production and manufacturing employment in those states depend

heavily on export markets.

In the Seventh District, where exports take nearly a fifth of the nonelectrical machinery and a tenth of both the electrical machinery and transportation equipment and where export-related employment accounts for 7 percent of the manufacturing employment, conditions that promote a healthy, growing export market are vitally important to the economic wellbeing of the region. Continuation of the substantial expansion in exports last year—and the first part of this year—is certain to be reflected in increases in income and employment in district states.

These states may seem to be a long way from markets in Europe and the Far East, but an examination of the importance of the overseas markets to businesses and workers of the Midwest indicates that in economic terms the distance is not at all that great. These markets are, in fact, getting very close.

# Cattle cycles in perspective

Gary L. Benjamin

Cattle cycles are measured from one cyclical low in inventory numbers to the next. The physiological requirements of cattle production give cycles considerable consistency. But because of economic factors—and other factors, such as changes in tastes and technology—cycles also vary considerably.

The last cycle was different in several respects. It started in 1967 and was the longest since the 16-year cycle that ended in 1928. The cyclical downturn, which began in 1975, has been the sharpest on record.

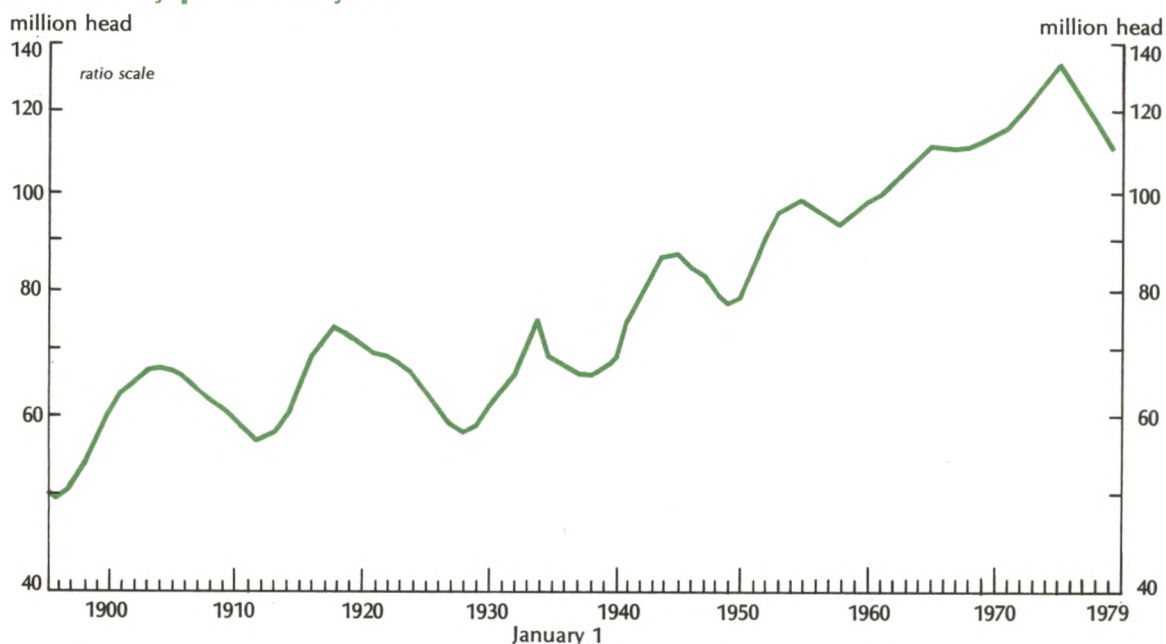
This unparalleled contraction underlies the past two years of decline in beef production. And even though cattle numbers now appear to be rising, a study of previous cycles shows beef production could be down for another year or two.

## Cycles since 1896

Estimates of the January 1 inventory of all cattle—including calves—are available back to 1867. Cattle numbers doubled between 1867 and 1890 and then declined nearly a fifth over the next six years. Since there is no data to mark the beginning of that cycle, however, the first fully measurable cattle cycle starts from the low reached in 1896.

There have since been seven cycles. They have averaged 12 years in duration, encompassing seven years of expansion and five years of contraction. During expansion phases, cattle numbers have risen an average of 28 percent. During contractions, numbers have declined an average of 12 percent. When the recent cycle began in 1967, the cat-

## In the past four years cattle numbers declined faster than in any previous cycle



tle inventory was about 109 million head. By 1975, the number had climbed to 132 million, an increase of about 21 percent. By the beginning of 1979, however, the inventory had declined 16 percent from the peak to less than 111 million head.

### **Nature of cattle cycles**

Most livestock and poultry commodities have a production cycle. But, because of physiological differences, cattle cycles are the longest.

Cows ordinarily produce only one calf a year. Gestation takes nine months and twins are rare. By contrast, a sow produces 16 to 20 offspring a year. This reflects at least two pregnancies, each lasting less than four months, plus multiple births, and the increasing practice of farrowing pigs in confinement to protect them from the weather. A hen serves in the hatchery supply flock about ten months of a year, producing around 150 eggs. The eggs hatch after three weeks in an incubator.

It also takes longer to raise a calf to a mature age for breeding or slaughter. A heifer produces its first calf at two years of age. The lag from birth to first offspring is ten months for a gilt and six months for a hen.

Raising a calf to slaughter weight requires about 18 months, including five to eight months in a feedlot. A pig is ready for market in six months, a chicken in less than two.

In addition to physiological factors, there are also economic forces that govern cattle cycles. These forces are initiated at the retail meat counter, where beef is priced relative to consumer demand and the availability of other meats. Beef prices high enough to make live cattle profitable encourage production, and vice versa.

Feedlot operators—who feed cattle high protein diets designed to produce high quality carcasses—are the first to react to beef prices. As prices change they adjust the number of feeder cattle brought into the feedlots. In turn, the number of cattle moving through feedlots affect cow-calf operators, who control the cattle breeding stock and

supply feeder cattle to feedlots.

Except for the few that die otherwise, all calves are eventually slaughtered for meat. However, there are differences governed by economic considerations in when they are slaughtered. A calf can be killed for veal. Or it can be raised to spend some time in the breeding herd. Or it can be raised specifically for slaughter, either on grass or in feedlots. The choices of feedlot operators directly or indirectly affect the number of head that move through each channel, with the result that decisions of these operators have important short-run implications for beef supplies. But longer-term shifts in beef production are more closely tied to the decisions of cow-calf operators. The decisions of cow-calf operators, although not unrelated to the actions of feedlot operators, largely determine the momentum and the turning points in cattle cycles.

The economic conditions during the two or three years around the low of a cattle cycle reflect tightening supplies and rising prices of beef. But high beef prices also boost prices for fed cattle, in turn, strengthening demand for feeder cattle. Incentives to slaughter calves for veal are lessened. And opportunities are increased for building breeding herds and raising calves that will meet the growing demand of feedlot operators.

Breeding herds can be rebuilt only through less culling and more diversion of heifers from slaughter to breeding herds. Rebuilding herds temporarily aggravates the already short supply of beef. But over a period of three or four years, stronger markets provide the basis for increased beef production.

As herds are rebuilt and the increase in offspring eventually moves into slaughter channels, the supply of beef comes into better balance with demand. Because of the long physiological delay required to increase cattle production, it is hard for producers to anticipate the timing of equilibrium conditions. Decisions that accommodated the catchup in beef supplies cannot usually be changed fast enough to keep the balance from tipping to excess supply. The results are low fat-cattle prices (relative to production

costs) and reduced demand for feeder cattle.

As cow-calf operators begin losing money, they start liquidating their herds. And that, in turn, swells beef supplies for a while, further depressing cattle prices and aggravating the loss situation already plaguing cattlemen. Not until the herd has been reduced to the point that beef supplies turn short, again triggering profits, do cow-calf operators begin rebuilding their herds.

This economic scenario is, of course, generalized. But it shows the nature of the problem. Because of the time required to produce cattle, equilibrium between the demand for beef and the supply of cattle is hard to maintain. And because decisions of cow-calf operators to cull or rebuild their breeding herds exaggerate fundamental conditions of the beef market, year-to-year changes in beef production do not always coincide with the trend in cattle numbers.

### **Changing tastes and technology**

In addition to physiological and economical factors, changing tastes and technology also affect cattle cycles. The rapid spread of feedlots after the 1940s brought a major change in the way cattle are raised. Supported by abundant supplies of feed grains, feedlots provided a quick, efficient way of converting beef on the hoof to hanging carcasses. As feedlot capacity expanded in the 1950s and 1960s, there was a marked up-trend in the production of beef.

Meanwhile, as eating away from home became more popular after the 1940s, the old preference for grain-fed beef over grass-fed beef was reinforced by the availability of better cuts of beef that had been fattened in increasingly efficient feedlots.

The changing composition of the cow herd has also affected cattle cycles. The cow herd is made up of dairy animals and beef animals. Each is a distinct element of the herd, but because both produce meat, they are closely related.

The composition of the herd has been shifting since the Depression. Two out of three cows in the 1930s were dairy cows. The

number of dairy cows peaked, however, in the mid-1940s at 28 million and has since trended steadily downward. Growth in total cow numbers since has been entirely in beef animals. When the number of all cows peaked last in 1975, at 57 million head, four out of five were beef cows.

Effects of this continuing shift in the cow herd have affected cattle cycles from both the production and consumption side. Dairy cows accounted for a disproportionately large share of the overall cow herd liquidations that accompanied the cyclical downturns in the 1940s, 1950s, and the 1960s. But in the downturn of the 1970s, beef cows declined relatively more than dairy cows.

Where the 1950s and 1960s were marked by growth in demand for fed beef, the 1970s were marked by growth in demand for convenience foods and lean beef—the type usually obtained from imports and from cows and grass-fed cattle. This shift was accommodated by the rise in fast-food chains and probably extended the liquidation phase in the last cycle longer than would have otherwise been the case.

### **Comparisons of past cycles**

For all their similarities, cycles have varied considerably in both their expansion and contraction phases. Expansion phases of the seven cycles that can be studied have lasted from six to eight years. The relative expansion, however, has varied widely, as has the rate of expansion.

In the past two cycles (1958-67 and 1967-79) the expansion from trough to peak has been roughly 20 percent. In the previous five cycles, the relative expansion varied from 26 percent to 36 percent.

Not only was growth in the past two cycles less, but the rate of increase was also slower. In both the last two cycles, the compound annual rate of increase in cattle numbers was about 2.5 percent. In previous cycles, the rate ranged from 3.8 percent to 4.6 percent.

Despite the relatively small increase in cattle numbers during the expansion phase of

### Selected characteristics of past cattle cycles

Cycle*	Expansion phase			Contraction phase		
	Length in years	Percent increase		Length in years	Percent decline	
		Total	Annual rate		Total	Annual rate
1896-1912	8	35.0	3.8	8	-16.2	-2.2
1912-28	6	31.2	4.6	10	-21.5	-2.4
1928-38	6	29.7	4.4	4	-12.3	-3.2
1938-49	7	31.1	3.9	4	-10.2	-2.7
1949-58	6	25.7	3.9	3	-5.6	-1.9
1958-67	7	19.5	2.6	2	-0.2	-0.1
1967-79	8	21.4	2.5	4	-16.0	-4.3

\*The cycles extend from one cyclical low point in inventory numbers to the next. The inventories are determined as of January 1.

the last cycle, the growth that did occur was from a base that had been virtually unaffected by the nominal contraction that ended the previous cycle. As a result, when the inventory peaked in 1975, cattle numbers were abnormally high compared with previous peaks, causing some concern about the financial implications of an overbuilt inventory.

Cycles have varied more in the contraction phases than in the expansion phase. Up until this last cycle, contractions have lasted two to ten years. The declines in inventory numbers had ranged from as little as 0.2 percent in the downturn of the 1960s to 21.5 percent in the downturn of the 1920s. The compound annual rate of decline has ranged from 0.1 percent (in the 1960s) to 3.2 percent (in the 1930s). The contraction phase of the last cycle lasted four years, producing a relative decline of 16 percent and a compound annual rate of decline of 4.3 percent.<sup>1</sup> The relative decline has been the largest since the 1912-28 cycle. And the rate of decline has been by far the sharpest for any downturn.

<sup>1</sup>It is not yet clear whether 1979 will mark the fifth year of contraction in the last cycle or the first year of expansion in the next cycle. But for all practical purposes, it would appear that cattle numbers have bottomed out. Deletions from the cattle inventory this year (through slaughter and death losses) will probably about match inventory additions (through the 1979 calf crop and net imports). Hence, the January 1, 1980, inventory estimates will probably be virtually the same as at the beginning of this year or perhaps slightly higher. If lower, but only by a negligible amount, the compound annual rate of decline over the five-year contraction phase of the cycle would still be 3.5 percent.

### Extent of the recent downturn

Several factors contributed to the sharpness of the recent downturn. Major factors, however, were drought and disruption in the long-term growth of commercial feedlots in the first half of the 1970s.

The number of cattle in feedlots, based on January 1 inventories, rose almost without interruption after the Korean War, increasing 70 percent in both the 1950s and the 1960s. The pace of that buildup helped reduce the effects of the contraction phases of the 1949-58 and 1958-67 cycles by sustaining a growing demand for feeder cattle. This growth in demand short-circuited much of the cyclical rise in cow and heifer slaughter that usually accompanies downturns in cattle numbers.

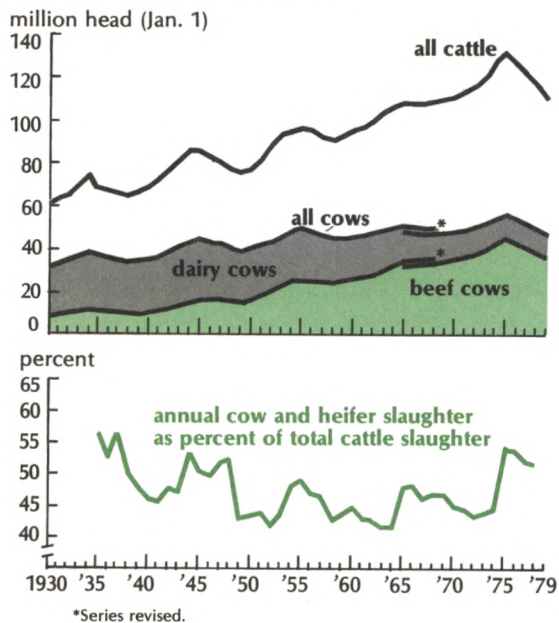
Feedlot inventories continued to rise in the early 1970s, peaking in 1973 at 14.4 million head. Over the next two years, however, the number of cattle on feed plunged 30 percent to a ten-year low. And although inventories later moved higher, the 13.3 million head in feedlots at the beginning of 1979 was about the same as at the beginning of the decade.

Interruption of commercial feeding has made the recent contraction more intense than downturns in the 1950s and 1960s. With the sharper drop in demand for feeder cattle, losses spread quickly to cow-calf operators, who responded by liquidating their herds and cutting back on heifers held for breeding.

On top of that, pastures suffered in the drought of the mid-1970s and forage became less available, boosting the costs of feeding and keeping cow herds. Cow and heifer slaughter rose sharply, accounting for 52.5 percent of the annual cattle slaughter since 1974. That is the highest proportion since the downturn from 1934 to 1938, and compares with averages of about 47 percent during the liquidation phases of the 1949-58 and 1958-67 cycles.

Several factors combined to disrupt commercial feedlot activity in the 1970s. Imposition of controls on meat prices in the spring of 1973—and announcement that summer that controls would soon be lifted—generated expectations of higher prices once controls

## Beef cows accounted for a large share of cow herd liquidation in the 1970s downturn



were removed. Producers responded by delaying their marketings. And consumers responded—despite a publicized “beef boycott”—by stockpiling beef.

When controls were removed, cattle markets were quickly glutted. Large marketings put downward pressure on cattle prices, and the pressure was reinforced by a lackluster demand for beef as consumers ate into their hoards. This, coupled with rising feed prices that came with suddenly much larger grain exports, brought losses to feedlot operators.

These losses were compounded the next summer when the rise in feed costs was further escalated by weather problems that sharply reduced supplies of feed. The movement of cattle into feedlots slowed even more, extending losses to cow-calf operators. And about the same time, the general economy turned down, bringing a further curtailment in consumer demand for beef that stretched on into 1977.

These developments coincided with the approaching peak in cattle numbers. Liquidation

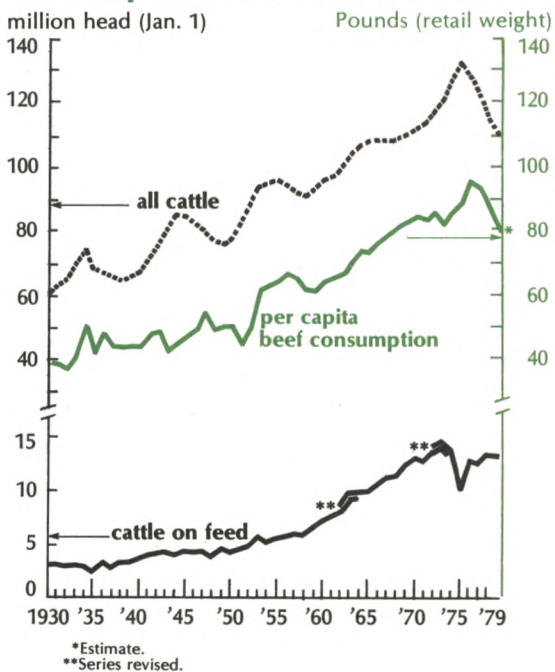
of the cow herds, evident in late 1974, became intense in 1975 and continued high throughout much of 1978. As a result, annual cattle and calf slaughter for 1975-77 averaged 22 percent above the average for the first half of the decade.

Beef supplies were swelled for a while. But the liquidation led to an over correction that produced the first evidence of shortages in 1978 and prospects that supplies could remain tight for another year or two. Per capita beef consumption has swung wide. From a peak of 95.7 pounds (retail weight) in 1976—13 percent above the annual average for the first half of the decade—per capita beef consumption will probably decline to 79 pounds in 1979. That will be the lowest level of beef consumption in a decade.

The extent of contraction is striking in several respects.

- The inventory of all cattle is down 16 percent—and so is the inventory of cows. This is the biggest decline in any contraction since

## Interruption in the growth of feedlot activity contributed to the sharp downturn in the 1970s



the one that ended the 1912-28 cattle cycle.

- The number of beef cows is down 19 percent—the largest drop since the contraction of the 1934-39 cycle, when the number fell 21 percent.

- Last year's calf crop, at 43.8 million head, was 14 percent less than the 1974 record and the smallest crop in 11 years. In the four previous cycles, the decline in the annual crop ranged from 1 percent to 10.6 percent. And with fewer cows now, this year's crop could be down another million head, possibly marking a 16-year low.

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The extent of the contraction points, of course, to the possibility that the worst of it could be behind us. Recent evidence suggests that the contraction phase has ended. In the fourth quarter last year, for example, cow slaughter was down 27 percent from the same period a year earlier. In the first quarter, this year, the margin widened to 33 percent. This was the smallest first-quarter slaughter since 1972.

These changes come too late, however, to offer any hope of increasing beef supplies before 1982.