

# ECONOMIC PERSPECTIVES

MARCH/APRIL 1993  
A review from the  
Federal Reserve Bank  
of Chicago

**Consumer debt and  
home equity borrowing**

**1993 Bank Structure  
Conference program  
highlights**

**Assessing global auto trends**

**Trends and prospects  
for rural manufacturing**

FEDERAL RESERVE BANK  
OF CHICAGO

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# Consumer debt and home equity borrowing

Francesca Eugeni



Consumer debt ratios are important analytical tools because they allow economists and business people alike to evaluate households' financial conditions and forecast consumer spending, which is a crucial component of our economy. Because consumer spending represents two-thirds of the United States' gross domestic product, fluctuations in households' consumption affect the economy's output. Typically, rising levels of personal consumption expenditures stimulate the economy, while slower growth or declines in this component have a dampening effect on economic growth.

In general, individuals base their spending decisions on several factors, including the level of their existing indebtedness and their disposable income. Therefore, we need to measure household debt appropriately in order to forecast consumer spending behavior. To evaluate consumer indebtedness and consumer liquidity, analysts often use debt to income ratios, which measure the ability of consumers to cover outstanding obligations with income.

The analyst's most difficult task when calculating debt to income ratios is to choose the debt measure that can best reflect the full weight of consumer indebtedness. If the measure of debt is too narrow, the resulting debt to income ratio will understate the true magnitude of consumer debt, while a debt measure that is too broad will inflate the real level of indebtedness. In either case, the resulting forecast of consumer spending behavior will be inaccurate.

For example, the most commonly used measure of consumer indebtedness, the ratio of consumer installment credit to disposable personal income, has been declining consistently since the beginning of 1990, reaching a seven year low in the second quarter of 1992. It has been widely suggested that the recent decline in this commonly used ratio indicates that consumers finally have strengthened their balance sheets by lowering the level of their indebtedness, and will be able to sustain rising levels of spending in the future. However, a close look at the major components of household debt indicates that, over the last six years, consumers have been substituting home equity borrowing for other types of credit. Moreover, a recent increase in auto leases suggests that consumers also have been replacing traditional automobile loans with less costly auto leasing agreements. One of the results of these substitution trends is a decline in consumer installment credit outstanding which, in turn, causes the ratio of installment credit to disposable personal income to overstate the true change in consumer indebtedness. Because consumer borrowing behavior has changed over time, we need to adjust our gauging tools accordingly and find a debt measure that can best reflect such changes.

This article proposes more comprehensive debt to income ratios that take into account the

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substitution of home equity borrowing for consumer installment credit. The analysis indicates that, when total home equity lending is included in the measure of consumer indebtedness, the consumer debt ratio has not declined consistently during the last two years, and it is much higher than the ratio of consumer installment credit to disposable personal income. Moreover, the analysis indicates that the substitution of auto leasing for automobile loans causes an understatement in the real magnitude of automobile credit outstanding.

The evidence presented in this article suggests that the recent restructuring of consumers' balance sheets may not have been as significant as the traditional debt ratio indicates, and that the apparent improvement mostly reflects a reclassification of consumer liabilities among the different components of household debt. Furthermore, although the rate of growth of household debt has slowed in the early 1990s, the analysis indicates that the more appropriate measure of consumer credit has not declined dramatically since 1989, which also suggests that households might not be able to sustain higher levels of spending in the near future.

### **The components of household debt**

The two major components of household debt are consumer credit and home mortgage debt. As of the third quarter of 1992, consumer credit represents approximately 19.3 percent of total household debt, and it consists of installment credit and noninstallment credit. Noninstallment credit represents only 7 percent of total consumer credit and consists mostly of short term credit, such as charges on credit cards that require payment in full within the billing cycle. Because noninstallment credit is such a small component of consumer debt, it is normally excluded when calculating debt to income ratios. Clearly more important, consumer installment credit represents 93 percent of total consumer credit, and it is comprised of automobile loans, revolving credit, and "other" installment credit.<sup>1</sup> Total household debt as measured by the Federal Reserve Board<sup>2</sup> also includes "all other" debt (tax exempt debt, other mortgages, bank loans n.e.c., and other loans) which currently represents 10.3 percent of total household debt. In the remainder of this article, household debt will include only its two major components, home mortgages and consumer credit.

Home mortgage debt currently represents 70.4 percent of total household debt, and it consists of all loans secured by one-to-four family residential properties, including home equity loans and home equity lines of credit, which are loans secured by the equity in the borrower's primary residence. Home equity loans are traditional closed end loans that require scheduled monthly repayments of principal and interest for a predetermined period of time. Home equity lines of credit are revolving accounts (open end lines) that allow borrowers to make withdrawals against an approved dollar amount.

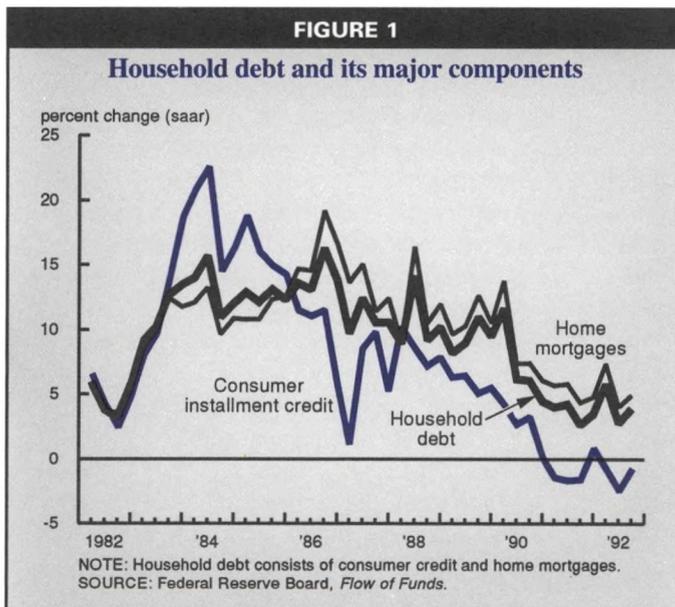
Separate data on total home equity lending are not available, as loans secured by residential property are all grouped together in the all inclusive category of home mortgages. However, data on home equity lines of credit outstanding at commercial banks and thrifts are available in the *Report of Condition*, which summarizes balance sheet data of insured depository institutions.<sup>3</sup> Moreover, because of the increased popularity of home equity lines of credit during the last six years, different entities have been publishing survey data on home equity lending since 1987.<sup>4</sup> Nevertheless, none of these sources offers complete historical data on both home equity loans and lines of credit for the lending industry as a whole. Therefore, the data on home equity lending used in this article to calculate adjusted debt to income ratios are estimated.

### **The shift to home equity borrowing**

As shown in Figure 1, during the last ten years, household debt (consumer credit and home mortgages) grew rapidly until 1990, when the rate of growth, although still positive, started to slow down. However, from the second half of 1983 to the end of 1985 total debt growth was boosted mainly by sharp increases in consumer installment credit, while from 1986 to the present the growth in total debt has been fueled mostly by home mortgages.

In fact, home mortgages, including home equity lending, grew at an average seasonally adjusted annual rate of 15 percent from 1986 through 1987, compared to 11 percent in 1984. On the other hand, the growth in consumer installment credit slowed to an average 8 percent rate from 1986 through 1987, compared to 19 percent in 1984.

In the early 1990s, the accumulation of both home mortgage debt and consumer installment credit slowed down considerably compared to



the 1980s. Installment credit actually declined 0.9 percent in 1991, and 1.2 percent in 1992.<sup>5</sup> On the other hand, home mortgage debt continued to rise during the last three years, although at an average annual rate of approximately 6.5 percent.

Typically, when the level of home mortgage debt increases, we expect home sales to rise accordingly, especially when nominal mortgage interest rates are declining. However, home sales were relatively weak from 1987 to 1991. Part of this anomaly can be explained by the fact that home mortgage debt does not consist exclusively of acquisition mortgages. Other components, such as home equity borrowing, are included in home mortgage debt and changes in these items are not correlated with changes in home sales.

Home equity lending, and especially lines of credit, became extremely popular between 1986 and 1988, soon after the enactment of the Tax Reform Act of 1986. "Surveys of Consumer Attitudes," conducted in 1987 and 1988 by the University of Michigan, show that 11 percent of homeowners had home equity loans in the second half of 1988, compared to 6.8 percent in 1983. Moreover, 76 percent of all the lines of credit in existence at the time of the surveys were opened in 1986 or 1987, compared to only 3 percent in 1983.<sup>6</sup>

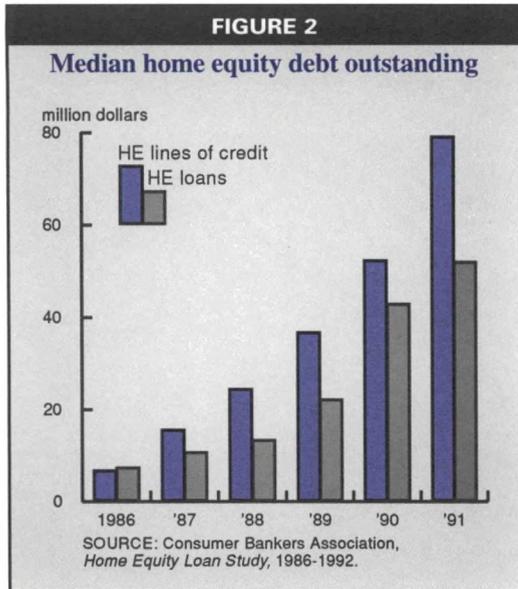
The Tax Reform Act of 1986 phased out personal interest expense on nonmortgage loans as a tax deduction over a five year period (reaching zero deductibility in 1991). This meant that the tax deductibility of personal interest on credit cards, auto loans, and personal loans disappeared

gradually while mortgage interest remained deductible. Because home equity loans (closed end loans) and lines of credit (open end lines) are secured by a lien on residential property, they are classified as mortgage loans, therefore allowing almost full deductibility of interest expense. The only restriction is that the amount of home equity debt on which the interest is deductible may not exceed the lesser of the home's true equity (home's fair market value less acquisition debt) or \$100,000.

It is clear, therefore, that most of the initial surge in home equity lending, from 1986 through 1988, occurred as consumers were trying

to take advantage of the interest deductibility on mortgage loans, and were using home equity borrowing as a substitute for other types of credit and as a source of funds to repay more expensive outstanding debt. This view is also supported by the fact that the initial slowdown in consumer installment credit coincided with the first surge in home equity lending in 1986. In 1987, total consumer installment credit outstanding grew at one-third the average pace of 1984 and 1985. The growth in automobile loans started to slow down in 1987, and "other" credit was negative at the end of 1986 and remained considerably weak thereafter. At the same time, survey data show that the median debt outstanding under home equity lines of credit at the typical lender rose from \$6.8 million in 1986 to \$15.6 million in 1987, a jump of 130 percent. Debt outstanding under closed end loans rose from a median of \$7.4 million in 1986 to \$10.7 million in 1987, a gain of 44 percent (see Figure 2).<sup>7</sup>

Although mortgage interest expense remained deductible on both closed end loans and open end lines of credit, the Tax Reform Act of 1986 initially had a stronger impact on home equity lines of credit, as shown in Figure 2. This phenomenon can be attributed to the way homeowners originally used these two forms of home equity borrowing. Because home equity lines of credit are structured as simple revolving accounts, initially they were considered the closest substitute for more expensive types of consumer credit, while traditional closed end loans contin-



ued to be used mostly for home improvements. As Table 1 shows, in 1987, of the amounts borrowed under open end lines, 53 percent were used for debt consolidation, 19 percent for expenditures on consumer goods and services, and 25 percent for home improvements. In the same year, of the amounts borrowed under closed end loans, only 35 percent were allocated to debt consolidation, 16 percent were used for expenditures on goods and services, and 45 percent for home improvements. While the difference between the uses of closed end loans and open end lines was very pronounced in 1987, this difference narrowed somewhat in 1991, which seems

to indicate that consumers recently have been using home equity loans also as a substitute for traditional consumer loans. As Table 1 shows, in 1991, 43 percent of closed end loans were used for debt consolidation, and 26 percent were allocated to expenditures on goods and services. In the same year, 36 percent of open end lines were used for debt consolidation, and 32 percent were allocated to expenditures on consumer goods and services.

Overall, home equity lines of credit have become extremely popular over the last six years for the many tax and nontax advantages they offer to consumers compared to other forms of credit. For example, the interest rate charged on open end lines (approximately 2 percentage points over the prime rate) is usually much lower than interest rates on credit cards, car loans, and personal loans. Also, borrowers can use lines of credit on a need-only basis by means of checks, credit cards, and automatic teller machines. Usually, the amounts approved under open end lines are larger than closed end loans and are based on loan to value ratios ranging from 70 percent to 90 percent. For example, in 1991, the most common loan amount approved at the typical lender was \$28,000 under a revolving account, and \$19,000 under a closed end loan commitment.<sup>8</sup> Finally, repayment methods under lines of credit are more flexible than the monthly repayment schedules of principal and interest under closed end loans. Although minimum monthly payments usually are required under lines of credit, lenders offer different

methods of repayment. Some lenders require minimum monthly payments calculated as a fixed percentage of the outstanding balance. Other lenders require only interest payments for the duration of the loan, which typically is between 5 and 10 years, and one "balloon" payment when the loan matures.

After the initial surge from 1986 through 1988, home equity lending, and especially lines of credit, continued to increase steadily. As shown in Figure 2, in 1991, the typical lender had a median of \$79 million open end lines outstanding, and \$52 million closed end loans, compared to approximately \$7 million in 1986 for each type of

**TABLE 1**

**Uses of home equity debt**  
(percent of totals)

	1987		1991	
	Open end	Closed end	Open end	Closed end
Debt consolidation	53	35	36	43
Home improvements	25	45	28	29
Autos	4	5	11	10
Education	3	1	9	7
Investments	3	4	4	2
Other	12	10	12	9

NOTE: "Other" includes medical expenses, vacations, tax payments, major purchases, and business expenses.

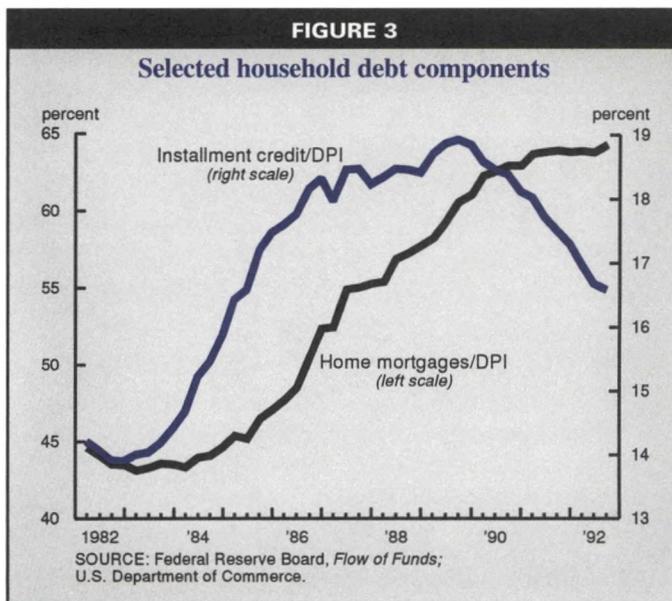
SOURCE: Consumer Bankers Association, *Home Equity Loan Study, 1989 and 1992*; Canner, et. al., *Federal Reserve Bulletin, 1988 and 1989*.

home equity lending.<sup>9</sup> At the same time, as shown in Figure 1, growth in consumer installment credit slowed considerably from 1987 to 1990 and declined in 1991 and 1992.

Although replacing other kinds of consumer loans with home equity borrowing might have no effect on the total stock of household debt, it causes consumer installment credit outstanding to decline. For example, expenditures on automobiles, consumer goods, and services that are made with funds borrowed under home equity programs increase the home mortgage component of household debt instead of consumer installment credit. Similarly, the use of home equity loans for debt consolidation might cause consumer credit outstanding to decline as existing liabilities are reclassified on the balance sheets of consumers. In fact, when consumers repay their outstanding debts with home equity loans and lines of credit, they do not reduce the total level of their liabilities. Instead, the amount of the original debt is shifted from consumer installment credit outstanding to home mortgages, where home equity borrowings are included. Although the total amount of household debt has not changed on the balance sheets of consumers (assuming that the new home equity loan equals the original debt), we understate the true magnitude of consumer indebtedness if we continue to use only consumer installment credit to calculate debt ratios.

### Consumer debt ratios

Consumer installment credit as a percent of disposable personal income is the debt ratio most often used to assess consumer liquidity, as it matches disposable personal income with short and medium term obligations. As Figure 3 shows, this debt to income ratio increased considerably throughout the 1980s, reaching an unprecedented level of 18.9 percent in the second quarter of 1989. However, from the peak in 1989, the ratio has declined consistently, falling to a seven year low of 16.7 percent in the second quarter of 1992, and to 16.6 percent in the third quarter of 1992. After over two years of declines in the most popular measure of household



debt, some might conclude that consumers finally have restructured their balance sheets by appreciably reducing their liabilities.

However, other broader measures of household debt clearly show that, although the overall accumulation of debt has slowed down since 1990, the true weight of consumer debt has not declined considerably during the same period. In fact, the debt to income ratio calculated using home mortgages continues to increase in the early 1990s (see Figure 3). In the third quarter of 1992, the ratio stood at 64.3 percent, which is almost 20 percentage points above its level in 1980. Therefore, while the debt measure using installment credit fell 2.3 percentage points from the third quarter of 1989 to the third quarter of 1992, the ratio of home mortgages to disposable personal income increased approximately 4 points over the same period. The end result is an increase of 1.1 percentage points in the ratio of household debt (consumer credit plus home mortgages) to disposable personal income over the same time period.

However, we have to be careful in the choice of a more comprehensive measure of consumer indebtedness. Including home mortgages in our measure of debt would actually cause the debt to income ratio to overstate the real magnitude of consumer liabilities. This is because home mortgage debt includes acquisition mortgages, which are long term commitments where only a small portion of the total debt has to be repaid each month. For example,

if we were to divide the entire amount outstanding of a 30 year mortgage loan by annual amounts of disposable personal income, clearly we would be inflating our debt measure.

On the other hand, although home equity borrowing is classified as mortgage debt, it differs from acquisition mortgages for two main reasons: 1) its uses, which are mostly debt consolidation and expenditures on consumer goods and services, and 2) its maturity, which is typically much shorter than the average life of first mortgages. Because these differences increase comparability between home equity borrowing and disposable personal income when calculating debt to income ratios, debt outstanding under home equity loans and lines of credit should be included in measures of consumer debt.

### Home equity lending estimated

Before introducing adjusted consumer debt measures that take into account the substitution of home equity borrowing for consumer installment credit, it is useful to discuss the methodology used in this article to estimate the data on home equity loans and lines of credit. Estimation of the data was necessary for several reasons. First, although data on home equity lines of credit are available starting with the 1988 *Report of Condition* of most depository institutions (commercial banks, savings and loans, savings banks, and credit unions), data on home equity loans are often grouped together with first mortgages. Second, separate data on home equity lending at investment banks and finance companies are not available in the *Report of Condition*, and third, data on home equity lending at depository institutions are somewhat understated due to the recent increase in securitization of home equity loans and lines of credit.

In general, securitization is a transaction whereby assets of an institution, such as residential mortgages, credit card receivables, automobile loans, and, recently, home equity loans and lines of credit, are pooled together and repackaged into securities which are then sold to investors. When the seller of the securities transfers all risks and benefits associated with the assets to the purchaser, the sale is said to be without recourse, and the assets are removed from the balance sheet of the loan originator. Because securitization is almost always without recourse, home equity loans and lines of credit outstanding reported by depository institutions are understated by those amounts that are securitized and

eliminated from the balance sheets of the financial institutions.

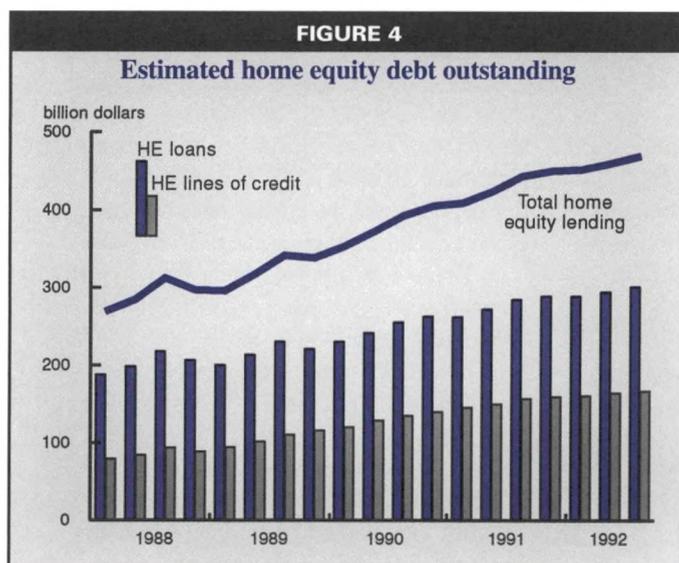
Although securitization of home equity loans and lines of credit is a fairly recent phenomenon, it has been growing at a very rapid pace since 1989. In 1991, new issues of securities backed by home equity loans and lines of credit reached an unprecedented \$10 billion, with 37 percent of home equity lines of credit securitized. This compares to \$2.7 billion in 1989, and \$5.6 billion in 1990.<sup>10</sup> In 1992, analysts estimate another \$10 billion in total new issues, with 42 percent of home equity lines of credit securitized.<sup>11</sup>

Available depository institution data on home equity lines of credit were first collected<sup>12</sup> and then total debt outstanding under home equity loans and lines of credit was estimated for the entire lending industry. The estimating process starts with the following findings from the 1987 and 1988 "Surveys of Consumer Attitudes:"<sup>13</sup> 1) insured domestic commercial banks had 40 percent of the home equity lending market at the end of 1987, and 2) home equity lines of credit represented approximately 30 percent of the total home equity loan portfolio of the typical lender in 1988.

The 40 percent market share was applied to home equity lines of credit outstanding at commercial banks to calculate a total for the industry in the first quarter of 1988 (\$32 billion/.40=\$80 billion). Then, data on lines of credit outstanding at commercial banks and thrifts were used to calculate a new market share (\$52 billion/\$80 billion=.65) which was used to estimate total lines of credit outstanding from 1988 to 1992. Then, since survey data show that lines of credit represented approximately 30 percent of total home equity lending in 1988, this proportion was used to calculate home equity lending for the industry as a whole from 1988 to 1992.

The estimated total home equity lending was then adjusted for the amounts of home equity loans and lines of credit securitized from 1989 to 1992. Finally, it is important to note that the understatement in depository institution data cannot be completely eliminated as information on whole loan sales and private placements of home equity loans and lines of credit are not available at this time.

As shown in Figure 4, the estimated total home equity lending increased 75 percent from 1988 to 1992, with increases of 110 percent for



open end lines and 60 percent for closed end loans during this same period. In the third quarter of 1992, total home equity lending reached an estimated \$469 billion, with 36 percent in home equity lines of credit. This compares to an estimated total of \$268 billion at the beginning of 1988, with 30 percent in open end lines of credit.

#### Adjusted consumer debt ratios

The foregoing analysis and survey data on home equity loans and lines of credit clearly show that home equity lending increased dramatically during the mid-1980s and continues to increase in the early 1990s. Because the substitution of home equity borrowing for other types of credit causes the traditional consumer debt ratio (installment credit to disposable personal income) to understate the true magnitude of consumer indebtedness, this article proposes three debt ratios that take into account this substitution trend. To develop an accurate formula for measuring debt, it is helpful to aggregate different components of debt and look at different ratios. For this reason, each of the three adjusted ratios presented in this article uses a different level of the estimated debt outstanding under home equity loans and lines of credit, ranging from a very conservative measure to a more inclusive one.

The three adjusted debt to income ratios shown in Table 2 all have disposable personal income (DPI) as the denominator, while each ratio has a different measure of consumer debt as the numerator. HE1CI/DPI uses the sum of total estimated home equity lines of credit and consumer installment credit. HE2CI/DPI uses the sum of consumer installment credit, total estimated home equity lines of credit, and the portion of estimated home equity loans that is used for expenditures on goods and services that typically are purchased with consumer credit. Finally, HE3CI/DPI uses the sum of total estimated home equity borrowing (total debt

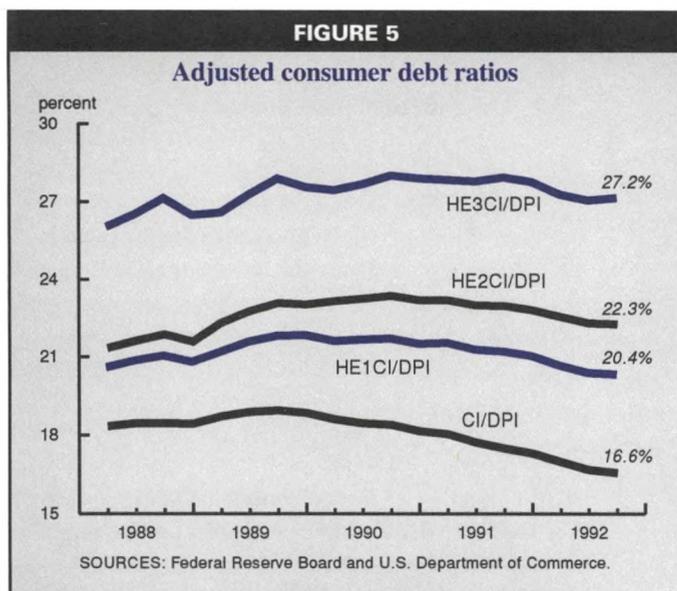
outstanding under loans and lines of credit) and consumer installment credit. Table 2 also shows CI/DPI, which is the traditional unadjusted ratio of consumer installment credit to disposable personal income.

The three adjusted ratios are graphed in Figure 5 together with the traditional consumer debt ratio (CI/DPI). HE1CI/DPI is the least inclusive of the adjusted measures of debt, accounting only for the substitution of home equity re-

**TABLE 2**  
**Adjusted consumer debt ratios**  
(percent of disposable personal income)

	(1) CI/DPI	(2) HE1CI/DPI	(3) HE2CI/DPI	(4) HE3CI/DPI
1989-Q1	18.7	21.3	22.3	26.6
1989-Q2	18.9	21.6	22.8	27.3
1989-Q3	18.9	21.9	23.1	27.9
1989-Q4	18.9	21.9	23.0	27.6
1990-Q1	18.6	21.7	23.2	27.5
1990-Q2	18.5	21.7	23.3	27.7
1990-Q3	18.4	21.7	23.4	28.0
1990-Q4	18.1	21.6	23.2	27.9
1991-Q1	18.0	21.6	23.2	27.9
1991-Q2	17.7	21.3	23.0	27.8
1991-Q3	17.5	21.2	23.0	28.0
1991-Q4	17.3	21.1	22.8	27.8
1992-Q1	17.0	20.7	22.6	27.3
1992-Q2	16.7	20.4	22.3	27.1
1992-Q3	16.6	20.4	22.3	27.2

SOURCE: Column (1), U.S. Department of Commerce and Federal Reserve Board. Columns (2), (3), and (4) are calculated by the author.



volving accounts for consumer credit, and it represents a very conservative adjustment of the traditional debt ratio. As shown in Figure 5, while CI/DPI fell 2.3 percentage points from the third quarter of 1989 to the third quarter of 1992, HE1CI/DPI fell only 1.5 points over the same period and has not declined since March 1992. Therefore, although HE1CI/DPI still is a very conservative measure of consumer indebtedness, it shows that the recent restructuring of the balance sheets of consumers has not been as dramatic as CI/DPI indicates, since HE1CI/DPI has not declined as much. Moreover, it is important to remember that HE1CI/DPI recently edged down because it accounts only for a portion of the total substitution of home equity borrowing for consumer credit. The most comprehensive adjusted measure of consumer leverage, HE3CI/DPI, will account for this phenomenon in its entirety.

HE2CI/DPI adds to home equity lines of credit that portion of home equity loans that is allocated to the purchase of consumer goods and to expenditures on services, such as education, vacation, and medical services, that typically are purchased with consumer credit. This portion represented 26 percent of total closed end loans in 1991, compared to 16 percent in 1987 (see Table 1). As Figure 5 shows, in the third quarter of 1992, HE2CI/DPI stood at 22.3 percent, which is much higher than the 16.6 percent level of CI/DPI, and only 0.8 percentage point below its level in the third quarter of 1989.

Therefore, both HE1CI/DPI and HE2CI/DPI, which account for only part of the substitution of home equity borrowing for other types of consumer credit, indicate that even with very conservative debt measures, consumer debt ratios have not declined significantly in the 1990s.

Finally, HE3CI/DPI, which is the most comprehensive adjusted measure of consumer debt, accounts for the substitution of all forms of home equity borrowing for consumer installment credit, and it shows a more complete picture of consumer indebtedness. Recall that evidence on the uses of home equity borrowing shows that consumer credit recently has been

replaced with both home equity loans and lines of credit. Therefore, the inclusion of both forms of home equity borrowing in our measure of debt is not likely to overstate the full weight of consumer indebtedness.

The debt to income ratio adjusted for total home equity lending (HE3CI/DPI) clearly shows that consumers have not been considerably reducing the true magnitude of their indebtedness, as the traditional debt ratio indicates. In fact, HE3CI/DPI has ranged between 27 percent and 28 percent for the past three years and stood at 27.2 percent in the third quarter of 1992, which is only 0.7 percentage points below its peak level in 1989 (see Figure 5). Moreover, in 1990 and 1991, HE3CI/DPI averaged 27.7 percent and 27.9 percent, respectively, compared to an average of 27.4 percent in 1989. For the three quarters of 1992, the ratio averaged 27.2 percent, which is virtually unchanged from 1989.

All of the adjusted debt measures discussed in this section show that the recent restructuring of consumers' balance sheets has not been as dramatic as the traditional measure suggests. HE3CI/DPI, the most inclusive ratio and consequently a more accurate representation of consumer debt, is the most dramatic, indicating that the true measure of consumer credit remains virtually unchanged in the 1990s.

#### Debt service payment ratios

Another important debt ratio used to evaluate consumer liquidity is the ratio of debt service

payments to disposable personal income, which measures the ability of consumers to meet scheduled repayments of principal and interest on their outstanding debts. One measure of this consumer debt service burden, estimated by staff of the Federal Reserve Board, indicates that the ratio of debt service payments on total outstanding debt to disposable personal income has been declining steadily since the beginning of 1991, reaching a six year low of 16.6 percent in the third quarter of 1992. As estimated by the Federal Reserve Board staff, debt service payments on both consumer installment credit and home mortgages relative to disposable income also declined over this period.

The recent reduction in these debt service ratios appears to conflict with the above conclusion that consumers have not substantially reduced their indebtedness and strengthened their balance sheets considerably. However, debt service payments on consumer installment credit outstanding do not include repayments on home equity loans and lines of credit, causing this ratio to understate the true size of consumers' current liabilities. Moreover, although debt service payments on home mortgages include servicing of home equity borrowings, most of the recent decline in mortgage repayments reflects heavy refinancing and repricing of outstanding mortgages at lower nominal interest rates.

After the Federal Reserve Board lowered the discount rate to 3.5 percent on December 20, 1991, and to 3 percent on July 2, 1992, borrowers started replacing their outstanding mortgages with new loan commitments at lower nominal mortgage rates, thereby reducing their monthly payments. In January and July 1992, mortgage applications for refinancings represented approximately 70 percent of all originations in both months, compared to about 30 percent for all of 1991.<sup>14</sup>

In summary, the recent reduction in debt service payments on consumer installment credit outstanding relative to disposable income seems to overestimate the apparent restructuring of consumers' balance sheets, as this debt measure does not include monthly disbursements on home equity borrowings. Moreover, although the ratio of total household debt service payments to disposable income is calculated using the most comprehensive measure of debt (including home equity borrowings), part of the recent decline in this ratio was due to lower nominal interest rates. Therefore, although this reduction in debt servicing obligations lessened the repayment burden of

consumers, it cannot be attributed entirely to a retrenchment of household debt.

### **The shift to auto leasing**

Another recent trend in consumer spending behavior is the substitution of auto leases for traditional automobile loans. In this case, the substitution phenomenon also causes an understatement in the real measure of consumer credit and should be taken into account when we evaluate the full weight of consumer indebtedness.

Auto leasing has become extremely popular during the last six years mostly because it allows consumers to lower their monthly payments of principal and interest on a new vehicle. This is possible because the individual who leases the vehicle (lessee) finances only a portion of the total value of the car. Then, at the end of the lease, the lessee can either purchase the car for a set residual price or simply return the vehicle to the lessor. Moreover, because of the favorable lease terms and rates, consumers often can lease a more expensive vehicle without considerably increasing their monthly disbursements.

Automotive leasing data collected by CNW Marketing/Research<sup>15</sup> show that 24 percent of total passenger cars delivered were leased in 1992. This compares to 12 percent in 1986, and to a projected 28 percent in 1997. Moreover, as Table 3 shows, the total value of the consumer lease fleet of passenger cars went from \$13.1 billion in 1986 to \$27.7 billion in 1992, an increase of over 100 percent. During the same period, the amount paid by consumers for new auto leases rose from \$8.3 billion to \$12.7 billion, a gain of 53 percent. This increase is remarkable especially if we consider that, in 1992, consumers financed only 46 percent of the total value of the lease fleet, compared to 63 percent in 1986. This decline in the lessee's debt exposure is mostly due to shorter maturities on new car leases in 1992 compared to 1986.

The increase in auto leasing during the last six years coincided with a slowdown in the growth of automobile credit. From 1987 through 1989, automobile credit outstanding grew at an average annual rate of 6 percent, while it fell at an average of 4 percent during the last three years. This compares to average annual increases of approximately 20 percent from 1984 through 1986. The earlier analysis of recent changes in consumer borrowing habits indicated that the use of home equity borrowings

TABLE 3

## Automobile leasing

	(1)	(2)	(3)	(4)	(5)
	Lessee's debt exposure	Value of lease fleet	Value of lease fleet cumulated	Ratio of consumer installment credit/DPI	Ratio adjusted for auto leases
	( ..... billion \$ ..... )	( ..... billion \$ ..... )	( ..... billion \$ ..... )	( ..... percent ..... )	( ..... percent ..... )
1986	8.3	13.1	13.1	18.3	18.7
1987	10.7	17.3	27.1	18.2	19.0
1988	13.2	21.0	40.5	18.4	19.5
1989	11.5	20.2	47.9	18.9	20.1
1990	10.0	17.8	47.8	18.1	19.3
1991	10.7	20.5	49.2	17.3	18.5
1992	12.7	27.7	57.0	16.6	17.9

NOTES: Amounts in column (3) are first amortized over four years and then cumulated. The ratio in column (5) is the sum of consumer installment credit and the cumulated value of the lease fleet in column (3) as a percent of disposable personal income.

SOURCE: Columns (1) and (2), CNW Marketing/Research, *Lease Trak Reports/8*, August 1992.

Columns (3) and (5) are calculated by the author. Column (4), U.S. Department of Commerce and Federal Reserve Board.

to purchase new autos and pay off more expensive automobile loans outstanding contributed in part to the recent slowdown in the growth of automobile credit. Here, the effects of the substitution of auto leases for traditional auto loans are evaluated and a measure of debt adjusted for such phenomenon is estimated.

First of all, it is necessary to express the value of the lease fleet in terms comparable to outstanding amounts of consumer installment credit. Table 3 shows the annual value of the lease fleet and the lessee's debt exposure from 1986 to 1992. For example, if the same cars were financed with traditional auto loans instead of leases, then consumers' debt exposure would equal the value of the lease fleet (assuming 100 percent financing of the vehicle total cost for a purchase). Moreover, the value of the leased vehicles should be cumulated, since auto loans typically are repaid in approximately four years. Also, only a portion of the total value of the lease fleet should be cumulated each year to allow for amortization of the auto loans over the four years. Therefore, the value rolled over each year is gradually reduced by one-fourth of its original amount to reach full amortization by the fifth year. Because at this time data on the value of leased vehicles are not available before 1986, the cumulated value of the lease fleet from 1986 to 1989 is not exactly comparable to the numbers cumulated for later years. However, the

purpose of these calculations is to give a general indication of the significance of the increase in auto leasing. At this point, the cumulated value of the lease fleet is added to consumer installment credit outstanding to obtain an estimated measure of debt adjusted for the shift to auto leases. As shown in Table 3, the new estimated measure is then used to calculate an adjusted debt to income ratio.

As Table 3 shows, although the ratio adjusted for auto leases has declined since 1989, it is much higher than the traditional ratio of installment credit to disposable personal income at any point. Moreover, the adjusted debt ratio does not take into account the substitution of home equity borrowing for other types of consumer credit, which causes installment credit to decline. Finally, if automobile loans outstanding are adjusted for the increase in auto leases, automobile credit fell only 7 percent from the third quarter of 1989 to the third quarter of 1992, compared to a 12 percent drop in the unadjusted measure of automobile credit during the same period.

The above analysis, once again, highlights the importance of choosing a measure of debt that takes into account the changes in consumer financing behavior and further suggests that even the most comprehensive adjusted debt ratio discussed earlier in this article (HE3CI/DPI) may still understate the full weight of consumer indebtedness.

## Conclusion

The evidence presented in this article shows that consumer borrowing patterns have changed during the last six years, as households have been taking advantage of less costly sources of credit. The substitution of home equity borrowing for other types of credit and the replacement of traditional auto loans with auto leases are clearly two important changes in consumer borrowing behavior.

One of the results of these substitution trends is a decline in consumer installment credit outstanding, which, in turn, causes the most commonly used debt ratio (consumer installment credit to disposable personal income) to understate the full weight of consumer indebtedness.

Therefore, to appropriately gauge consumer liabilities, we need to use a debt measure that is more inclusive, but not too broad, and more responsive to changes in consumer borrowing patterns. This article has proposed three consumer debt ratios that take into account the substitution of home equity borrowing for other types of credit. These adjusted debt to income ratios indicate that, although the rate of accumu-

lation of total household debt has slowed down since 1990, the real magnitude of consumer indebtedness has not been consistently declining during the last two years, as the traditional measure of consumer debt suggests.

Moreover, the recent substitution of automobile leases for traditional auto loans also causes an understatement in the true level of automobile credit, and its effects should be taken into account in assessing consumer indebtedness.

Finally, a fundamental result of this analysis is to suggest that the choice of an appropriate measure of debt can turn an overstated decline in consumer indebtedness into a virtually unchanged reality. In fact, in light of all the findings presented in this article it is reasonable to conclude that, although the burden of debt servicing has declined due to lower nominal interest rates, consumers have not significantly reduced their debt levels. This, in turn, seems to indicate that, after all, households might not be able to appreciably increase their level of spending in the near future.

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## FOOTNOTES

<sup>1</sup>"Other" installment credit includes mobile home loans, and secured and unsecured loans for education, boats, trailers, and vacations.

<sup>2</sup>Federal Reserve Board, *Flow of Funds Accounts*.

<sup>3</sup>The *Report of Condition* contains balance sheet and income statement information of insured commercial banks and thrifts. In general, insured depository institutions must file statements of condition and income with their respective federal government regulatory agencies on a quarterly or semiannual basis.

<sup>4</sup>The Consumer Bankers Association publishes annual *Home Equity Loan Studies*, and the American Bankers Association publishes annual *Home Equity Lines of Credit Reports*.

<sup>5</sup>Data for 1992 are through the third quarter, unless otherwise noted.

<sup>6</sup>Data from the 1987 and 1988 "Surveys of Consumer Attitudes" of the University of Michigan are from Canner, et. al. (1988) and (1989).

<sup>7</sup>The data are from the 1987 and 1989 Consumer Bankers Association's (CBA) *Home Equity Loan Studies*. Although the CBA's studies report both the mean and the median as measures of central tendency, in this article only the median will be used, as mean results can be at times skewed by

extreme observations. Moreover, Figure 2 seems to indicate that the typical lender maintains a higher portfolio of open end lines than closed end loans. Note, however, that Figure 2 plots only the middle results of the studies and that all of the respondents in the CBA's surveys offer both home equity lines and loans. Data from the *Report of Condition* indicate, however, that only 60 percent of commercial banks offer home equity lines of credit and that, overall, closed end loans represent a much larger share of the real estate loan market than open end lines.

<sup>8</sup>Consumer Bankers Association (1992).

<sup>9</sup>*Ibid.*

<sup>10</sup>Dean Witter Reynolds Inc. (1992); Duff & Phelps Credit Rating Co. (1992); and American Banker Bond Buyer (1992).

<sup>11</sup>Estimated total issues for 1992 are from David Olson Research Co., Columbia, MD.

<sup>12</sup>Federal Reserve Board database.

<sup>13</sup>Canner, et. al. (1988) and (1989).

<sup>14</sup>Mortgage Bankers Association (1992).

<sup>15</sup>CNW Marketing/Research, *Lease Trak Reports/8*, (1992).

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# FDICIA:

## *An Appraisal*

The Federal Reserve Bank of Chicago will hold its 29th annual Conference on Bank Structure and Competition at the Westin Hotel in Chicago, Illinois, May 5-7, 1993.

Attended each year by several hundred academics, regulators, and financial institution executives, the conference serves as a major forum for the exchange of ideas regarding public policy toward the financial services industry.

This year's conference will provide a broad based assessment of the merits and shortcomings of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991.

Among the highlights of this year's program will be:

- The keynote address by Federal Reserve Board Chairman Alan Greenspan.
- A panel discussion on the topic, "FDICIA: Renaissance or Requiem?" Prominent members of the academic, regulatory, and banking communities will discuss the impact of the new legislation.
- A luncheon address on banking reform by John G. Heimann, chairman of the Global Financial Institutions Group of Merrill Lynch & Company, Inc. and former superintendent of banks for New York State and Comptroller of the Currency.

- A panel discussion on the potential for systemic risk resulting from the rapid increase in over-the-counter trading of derivative and foreign exchange products. The panel will include leading experts on derivatives trading and interbank risk exposures.

- A luncheon panel, "The Outlook for Banking: Is the Crisis Over?," featuring L. William Seidman, former chairman of the Federal Deposit Insurance Corporation and currently chief commentator of CNBC; George M. Salem, first vice president of Prudential Securities; and Edward J. Kane, James F. Cleary Professor of Finance at Boston College.

As usual, our Wednesday sessions will showcase a wide array of more technical papers of primary interest to researchers in academia and government.

If you are currently not on our mailing list or have changed your address and would like to receive an invitation to the conference, please write or call:

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## Assessing global auto trends

**Paul D. Ballew and  
Robert H. Schnorbus**



The global automobile industry has gone through overwhelming restructuring during the last twenty years. This restructuring has produced, among other effects, massive downsizing and relocation for the Midwest, the birthplace of the mass production of vehicles. Assessment of current and future changes in the industry predict further adjustments, especially within the region. The factors prompting these adjustments are frequently depicted dramatically as emanating in large part from economic forces endemic to the U.S. market. Although this domestic emphasis is understandable, one subject that has received less attention is how the U.S. market has been impacted by the rapidly evolving global environment. For instance, the U.S. market constitutes only 25 percent of new vehicle sales in the world and its growth is slowing relative to the rest of the world. Indeed, an expanding portion of future economic growth and increases in consumer spending on autos is likely to originate abroad.

A current assessment of the domestic U.S. industry within this global marketplace indicates that the Big 3 (GM, Ford, and Chrysler) are almost exclusively concentrated in the North American and European markets. A sales dependency ratio for each of the Big 3 of North American sales to worldwide sales is presented in Figure 1. As indicated, Chrysler has the highest concentration in North America with a ratio of .96. This ratio has been increasing throughout the latter half of the 1980s, although the recent expansion of Chrysler in

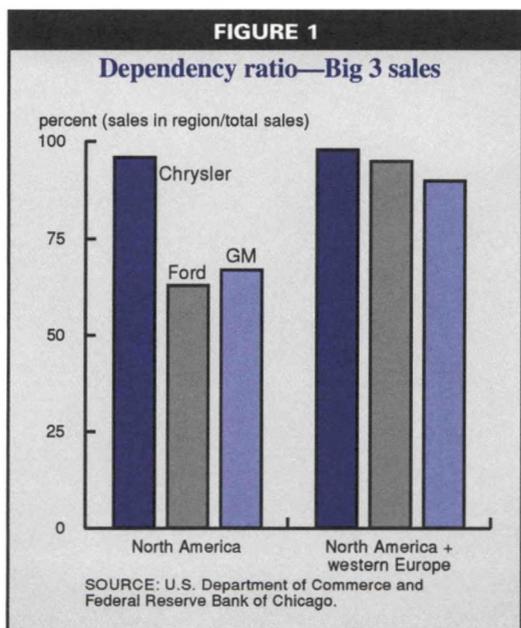
Europe should offset part of this concentration. Ford's North American ratio is .63, while GM's is slightly higher at approximately .67. Both of these levels are significant improvements over Chrysler. However, their North American and European to world sales ratios provide evidence of the degree of concentration and the dependency of Ford and GM in these markets collectively, with GM's combined ratio over .90 and Ford's combined ratio almost .95.

A major factor in this dependence is the limited presence of the Big 3 in developing markets, with the possible exception of Latin America. Of particular concern is the Big 3's absence in Asian markets where their combined sales are still less than 500,000 units annually. Eastern and central Europe are two potentially key emerging markets for the Big 3. However, competition from VW, Fiat, and, eventually, Japanese manufacturers will be intense. These markets are unlikely to achieve rapid growth in auto purchases before the end of the decade.

In an attempt to achieve an integrated analysis for the auto industry, this article analyzes each major and emerging market for

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vehicles first individually and then in aggregate. The purpose of this systematic approach is to reach some comprehensive insights and conclusions into the prospects for the U.S. nameplates in a marketplace where they must compete with foreign nameplates not only in their own backyard but also in markets throughout the world, most of which are less than hospitable. This article will also emphasize how these global developments impact auto producers in the Midwest, a region where the domestic industry is still highly concentrated.<sup>1</sup>

### Global demand for vehicles in perspective

Global sales of motor vehicles today are nearly 50 million units annually. In the last few years, sales have been approximately 4 to 5 million units below trend annually, with sales in the U.S. accounting for roughly half of this deficiency. This trend level of roughly 55 million units is well above the ten year average of 41.5 million units; and in fact, growth in the overall vehicle market has been significant in the last ten years, up almost 25 percent during the 1980s. Furthermore, market forecasts anticipate vehicle sales in excess of 60 million by the turn of the century.<sup>2</sup>

Currently, the market can be segmented into three mature markets and three important emerging markets. The mature markets collectively account for over three-quarters of the

world's production and sales of vehicles. Of these markets the U.S., Japan, and Germany are the most important. However, because of the degree of integration between the U.S. and Canada and among the seventeen major nations of western Europe, these markets have been grouped into U.S.-Canada, Japan, and western Europe. All three major markets are large producers with similar market shares. One difference is that Japan is export oriented, while U.S.-Canada and western Europe are domestically oriented. Western Europe and U.S.-Canada represent over 60 percent of all vehicle sales in the world, with Japanese domestic sales being significantly less, approximately 15 percent.

### U.S.-Canada

Among the mature markets, average light vehicle sales in the U.S.-Canada market over the past decade have reflected cyclical patterns as well as trend growth of the U.S. economy. Sales dropped significantly in 1981 and 1982 and rebounded to record levels in the 1984 to 1987 period. Since 1989, sales have declined as the U.S. and Canadian economies have slowed significantly, with combined sales declining to 16 million units in 1990 and bottoming out in 1991 with a decline to 14.5 million units. Furthermore, the sharp decline since 1989 had been preceded by a slow decline from the peak of 18 million units in 1986 toward a rate below the ten year average of just over 16 million units.<sup>3</sup>

The U.S.-Canada market has experienced significant competition over the last 20 years as foreign nameplates have eroded the stranglehold that the Big 3 once had on the market.<sup>4</sup> The market share for the Big 3 has steadily declined from over 90 percent to its current levels of 70 percent for light truck and cars combined and 65 percent for passenger cars. GM has been the biggest loser in the passenger car market with a loss in market share of more than 10 percent over the last decade. This erosion has been largely the result of market penetration of foreign nameplates, of which the Japanese brands have been most successful, with a market share today of approximately 25 percent in North America. This market share equals approximately 4 million units in annual sales.

Despite setbacks in the passenger car market, domestic nameplates have done extremely well in the growing light truck segment. This segment, increasingly dominated by Ford and Chrysler, represents, in large part, a shift in con-

sumer preference from cars to passenger light trucks, such as minivans and sports utility vehicles. During the past decade the number of light trucks sold annually has doubled, reaching almost five million in 1992. This growing market, along with product strength, traditional know-how of the segment, and trade restrictions, has allowed the Big 3 to maintain a market share of approximately 85 percent (even in 1991). Current vehicle introductions and redesigned versions have further stimulated sales at the expense of Japanese producers in particular. However, Japanese and domestic producers are responding to this growing demand with increased product development. For example, the recent introduction of Nissan's minivan, the Quest model, has been well received by auto critics. And Toyota has recently entered the mid-sized pickup truck market, perhaps as a stepping stone to the introduction of a full sized model.<sup>5</sup> Therefore, the continued dominance of even this segment by domestic producers is not guaranteed.

Expansion of foreign nameplates into luxury and sport cars as well as minivans and pickup trucks will continue to put pressure on domestic nameplates to retain market share.<sup>6</sup> Product development schedules are decreasing in length, price containment pressures are intense, and quality and safety improvements continue to accelerate. The pressure is intense for all producers and significant restructuring is prevalent even for Japanese nameplates. In fact, Isuzu has announced its intention to exit the light truck market in the U.S., and Mazda has delayed its entry into the luxury car segment by cancelling the Amati. The prospects for a North American free trade area or customs union may dampen some external competition due to domestic content requirements. However, it should foster intraregional competition, including transplant operations. Therefore, the U.S.-Canada market will likely continue to be one of the most competitive markets in the world, despite its relatively slow growth.

### ***Western Europe***

Unlike the U.S.-Canada market, the western Europe market—the second largest in the world—continues to have significant vehicle sales. Although sales declined slightly in the weaker economic environment in 1992, sales have trended steadily upward in the last 5 years. With access to central and eastern Europe, this market is rapidly becoming one of the most

important areas of growth in the industrialized world. With prospects for economic unification strong in the region, the presence of numerous firms, both local and foreign, continues to be a dominant character of the market. Thus, the key question concerns the consequences of economic integration for all auto manufacturers involved in western Europe.

Sales in the market, due primarily to a one time boost from German unification, were robust in 1990 and 1991. Sales in 1991 reached 15 million units and, although sales in 1992-93 are being depressed by the economic difficulties in Germany, the outlook is for sales of more than 15 million units annually into the late 1990s. Continued growth in certain European Community (EC) countries (notably Spain and Portugal) and the economic stimulus from further integration in the EC are expected to support these sales levels. Some of the demographics of a mature market that exist in the U.S., such as an aging population with modest income growth, are also present in Germany, the U.K., and France. However, these factors should be offset by further market integration and stronger economic growth.

Current sales in western Europe are divided among six major producers, with limited Japanese imports (approximately 12 percent), and a second tier of product or market specific manufacturers. Unlike other major markets, no producer has even marginal dominance of the western European market. Volkswagen, the market leader, comes closest with a western European market share of 17 percent, a stronghold in Germany (over 25 percent market share), and a significant share in every other market in Europe. Fiat and PSA (Peugeot-Citroen) are next with market shares of approximately 13 to 14 percent. Both producers are heavily concentrated in their domestic markets. PSA is more diversified than Fiat, but Fiat has increased its efforts in central Europe in recognition of this fact. A large portion of Fiat's dependency on the Italian market is due to the Italian government's decision to limit foreign imports.<sup>7</sup> Ford and GM both have significant sales presences in Germany and the United Kingdom and each has a market share above 12 percent. Both companies have been rapidly expanding in other markets; Ford in Italy and Germany and GM in Spain and the United Kingdom (a long time stronghold of Ford).

State owned Renault rounds out the major manufacturers with a market share of approximately 10 percent. The company focuses almost exclusively on the French market with only limited sales in other European markets. Recently, Renault has attempted to expand its reach through joint operating agreements, especially in Scandinavia.

A number of companies with significant market presences in specific markets recently have been acquired wholly or in part by larger firms. For instance, Saab has been partially acquired by GM, and Jaguar by Ford. Japanese manufacturers are also trying to increase their share of the market, but face a quota of 16 percent in the EC. Therefore, transplants have increased, although additional limits on these developments, labor costs, and other concerns may dampen this movement somewhat.

### *Japan*

Annual vehicle sales in Japan currently constitute the second largest single country vehicle market in the world. Sales in the late 1980s and in 1990 approached almost 8 million units a year. The continued growth of the market throughout the post-war era has resulted in per capita vehicle registration level comparable to the U.S. However, a variety of factors are currently reducing sales growth, including the current economic slowdown, an aging population, low population growth, parking and regulatory difficulties, and a maturing market.<sup>8</sup>

The domestic Japanese sales market is dominated by Toyota (35 percent), Nissan (20 percent), Honda (10 percent), Mazda (7 to 8 percent), and Mitsubishi (more than 5 percent), with other Japanese producers active in specific market segments. The bulk of the remaining market is comprised of foreign nameplates, although they have not reached any significant market penetration. In the past, trade restrictions limited foreign nameplate penetration. In recent years, other barriers, such as limited distribution networks and adaptation to local customers' tastes, have limited penetration. Annual sales volumes by foreign producers are still below 250,000 units (approximately 3 percent), and most of this activity is concentrated among European nameplates.

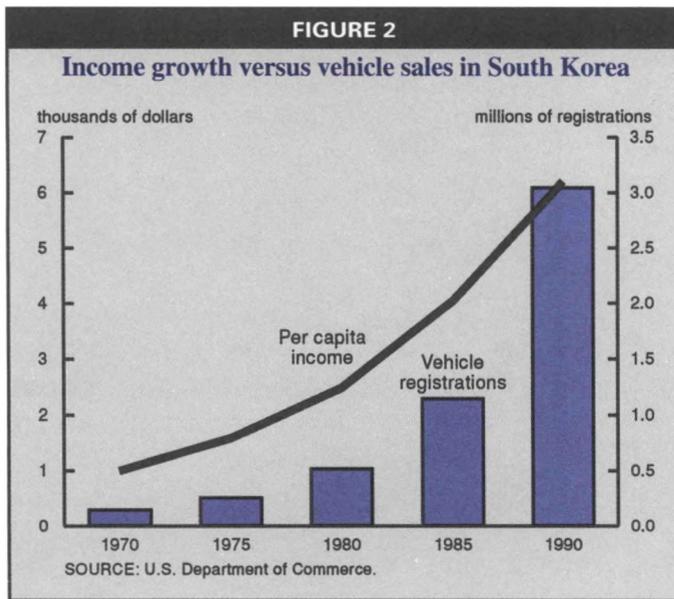
Overall, the market is currently in flux and the two dominant producers, Toyota and Nissan, have recently experienced significant sales setbacks. The current economic slowdown in a

mature and potentially stagnant market will continue to pose problems for these producers, although they will probably continue to dominate the market for the foreseeable future. Smaller Japanese manufacturers have experienced greater difficulty because they do not have the financial wherewithal to wage a competitive battle in multiple market segments.

### *Asia-Pacific region (excluding Japan)*

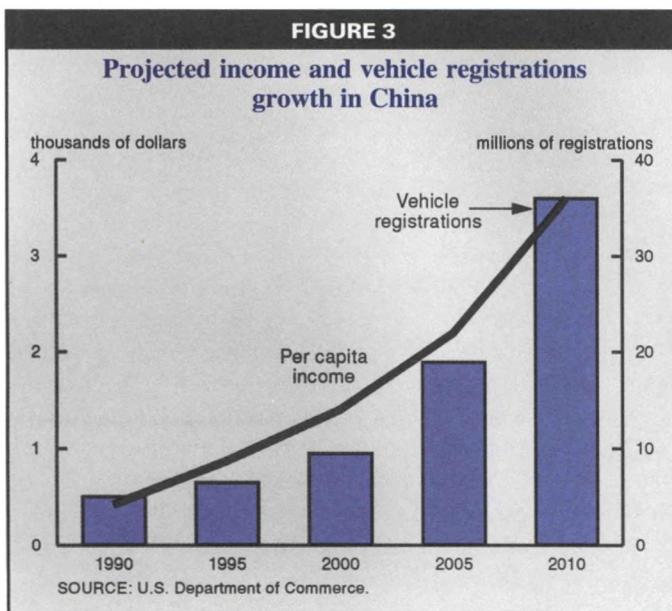
Overall sales in 1991 in the Asia-Pacific market, excluding Japan, were slightly less than 4 million units. This level is not significant relative to mature markets. However, the potential for growth is phenomenal. Sales in South Korea, for instance, are currently in excess of 1 million units and have more than doubled in last 15 years. Sales in Taiwan have also experienced strong growth in the 1980s: total vehicle sales annually are almost 500,000 units. Overall in the 1980s, non-Japanese sales in Asia grew in excess of 8 percent annually, a trend which is widely expected to continue in the 1990s. The remaining parts of the region represent an underserved, emerging market with strong income and population growth.<sup>9</sup> Additionally, economic reforms in the two most populous countries of the world, China and India, could potentially provide significant growth in consumer product sales.

In the early stages of development, consumers typically do not buy vehicles. However, gains in income eventually produce significant gains in vehicle purchases in underserved markets such as Asia. An estimate of these potential sales gains for China is indicated by Figures 2 and 3, which compare income levels and vehicle sales in South Korea during its phenomenal economic acceleration in the 1970s and 1980s to projected levels for China. As shown, growth in vehicle sales and all consumer durables in South Korea exploded once per capita income reached approximately \$3,500 a year. That is, at this level vehicle sales begin an upward swing which accelerated as income continued to gain. If China mirrors this trend, the gains in vehicle sales in the next twenty years may be surprisingly strong. For instance, if China's vehicle concentration is similar to the Korean experience, total vehicle registrations in China may approach 40 million units early in the next century. Current vehicle registrations in China are only 5 million.



Therefore, assuming some replacement, total sales could approximate 35 to 40 million units over the next 10 to 15 years, resulting in annual sales on average growing at four times their current sales rate.

If this growth seems unbelievable, it should be noted that mean income levels in the Guangdong Province in southern China, one of the most successful provinces, are currently estimated at above \$2,000 a year. Income growth is currently projected at more than 7 percent annually, with southern regions experiencing much more rapid growth. Furthermore, even



with this growth in sales the market will continue to be underserved, given an estimated population of 1.3 billion people by 2010. Consequently, future sales growth may be more rapid, although other constraints, such as space and regulations, may eventually set limits on the market.

Similarly, other nations in the region may achieve substantial growth in vehicle sales in the next few decades. For instance, per capita registrations in India are even lower than in China. Economic reforms are still in their infancy in this country, however, and remain a concern. Other Asian markets, principally Thailand, Indonesia, and Malaysia,

appear well on their way to reform and should boost sales of vehicles significantly in the years ahead.<sup>10</sup>

Market concentration is actually higher in some Asian markets than in the more established markets. The Korean market, for instance, is dominated by Hyundai Motors (over 50 percent), Kia Motors (over 20 percent), and Daewoo Motors (over 20 percent).<sup>11</sup> However, other markets are more diverse, with foreign nameplates active in Taiwan, where Ford has a strong market presence, and Thailand, where Toyota and other Japanese automakers are

active. One trend affecting market concentration is government activity. Besides trade barriers, many Asian markets have government sponsored companies or partnership programs that discourage market penetration. Japanese manufacturers have been the most successful at entering these markets through unconventional means. Partnerships as well as transplant facilities continue to provide Japanese manufacturers access to the market.

#### *Eastern and central Europe*

Perhaps the most important emerging market is in eastern and central Europe. This market currently is going through a massive restructuring phase with existing

state owned firms failing and/or being disassembled and western firms rapidly entering the market. Sales in the last decade have lagged due to limited income growth on the part of individuals. Overall the market is currently underserved with vehicle registrations well below western European levels. Pent up demand has been exhibited in many product markets since liberalization, as indicated by recent rapid sales growth.

While the near term sales outlook is somewhat bleak, with incomes falling and unemployment rising, the economic transformation is beginning to take shape and, as the recovery begins, higher income levels will result in increased demand in this underserved consumer market over the long term. Consequently, sales in Hungary, Czechoslovakia, Poland, and the Baltics should accelerate throughout the mid-1990s. Furthermore, the 280 million consumers in the Commonwealth of Independent States (CIS), a collection of former Soviet republics, will likely experience significant income gains in the late 1990s and, therefore, provide an added boost. These developments should significantly enhance the overall European market. A conservative estimate of vehicle sales of 6 million units annually seems likely by the end of the first decade of the next century, excluding a rapid economic transformation in the CIS. It is important to keep in mind that such a sales level would exceed annual sales in Germany. Furthermore, even given this sales level, the market will not be close to western standards.

#### *Latin America*

Latin America is another emerging market that is experiencing a significant economic transformation. Reform efforts have solidified growth in Mexico, Argentina, Chile, and Venezuela, and will eventually stimulate demand for durables in a market of 125 million consumers. Successful economic reform in Brazil and the Andean nations, which appears possible if not probable, could further stimulate the market. Although political instability is a major concern, democratic reforms and trade liberalization have increasingly solidified the gains made to date.

Current vehicle sales of almost 2 million units annually reflect the potential in the region. Given the economic hardship of debt restructuring and economic austerity programs, the current sales levels reflect positively on the de-

mand for vehicles in the region. The International Monetary Fund and World Bank estimate that the GDP of the region should continue to accelerate throughout the decade, averaging 4.5 to 5 percent annually. If the economies expand at such a rate, the recent annual sales growth in autos of over 20 percent may not be replicated, but growth should continue.

Potential growth in Latin America should boost Big 3 sales as well as European manufacturers' sales (especially Volkswagen), as these producers have significant presences in Mexico and Brazil. Recently, Japanese nameplates have begun to penetrate the market. However, the efforts have been limited. One wild card is the outcome of the various trade talks ongoing in the region. Modifications in domestic content restrictions and other trade barriers could significantly alter production and sales activity for various producers. The general effort to liberalize existing trade policies will likely accelerate investment, export activities, and domestic sales.<sup>12</sup>

#### **Current and future production activity**

Production activity mirrors sales activity within markets as well as export and relocation activities or producer trends. Changes in production activities in regions and between producers has been relatively dynamic in recent years. There has been continued movement toward lower cost production, an effort to close excess facilities in some market segments and expanded production in others in order to access new and growing markets. These trends are often a response to shifts in sales and competition among producers. To understand the future implications, it is important to understand the current production environment.

The global marketplace is comprised of 12 major manufacturers with annual production capacity above 1 million units and a second tier group comprised of manufacturers with production capacity below 1 million units, many of them specializing in specific market segments. The top six manufacturers account for over half of global production and the top 12 account for over three-quarters of all production. But in comparison to the 1960s and 1970s, the level of concentration is less and has become more geographically diverse. For example, GM is still the number one automaker, but its market share has fallen below 20 percent, Ford is sec-

ond with a 13 percent share, and Toyota is currently third with a 11 percent share.

Most manufacturers still have a core base in their traditional markets. Although one would not classify this core as stable, it still provides a degree of support and is a major consideration in most decisions affecting company operations. The major question for firms in the future may be whether or not they can maintain their position in their traditional market while at the same time penetrating new markets.<sup>13</sup>

#### *U.S. and Canada*

Production during the last decade has averaged approximately 12 million units annually in the combined U.S.-Canada market with significant growth occurring in two primary segments: light trucks and transplants. Light truck production, for instance, has more than doubled since the late 1970s and early 1980s.<sup>14</sup> Transplant production in the U.S. and, to a lesser extent, Canada, has also soared. Transplant production in 1982 was only a token level from Honda; by 1991 transplant production exceeded 1.6 million units annually and new capacity continues to be added, especially in light trucks.

Within this expansion of production there has been a change in mix of firms, led by the continued downsizing of GM, Ford, and Chrysler, especially in the U.S. By the mid-1990s, Big 3 employment will be more than 400,000 jobs lower than its level in 1980. Production by the Big 3 exceeded 11 million units in the mid-1980s, however, since that time, production has consistently headed downward, and is currently near 8 million units. GM is currently planning to close at least 4 assembly plants totaling over 1 million units of capacity. Gains in market share by foreigners coupled with the general competitive pressures to do more with less continue to shape the production decisions of the Big 3 as well. Future developments in production of units in North America should reflect the continued development of transplants, some additional downsizing of existing domestic nameplate operations in the U.S. and Canada, and some shifting of domestic nameplate production to foreign markets.

#### *Western Europe*

Western European production in the last five years has exceeded 13 million units. Capacity is currently estimated at more than 14 million units, with new facilities coming online. Current

production is concentrated in four principal countries: Germany, France, Italy, and the United Kingdom. Germany, where one in six jobs are linked to the auto industry, easily outstrips all other production areas, with production in excess of 5 million in 1991. French and Italian producers generally comprise a second tier of companies and are concentrated heavily in their domestic markets. British production increasingly involves U.S. and Japanese transplants or wholly owned subsidiaries, and production is mixed between domestic units and products exported to the continent.

Western Europe has six large firms and a second tier comprised of specialized and/or market specific firms, transplants, and imports. Volkswagen, PSA, GM, Ford, Fiat, and Renault are the top producers in this market representing 85 percent of production. The second tier is dominated by luxury car makers like BMW and Mercedes and single product firms like Volvo. Recently, mergers and consolidations have reduced the number of independent companies. Furthermore, competition has also redistributed market share among the largest firms, with GM and VW on the ascendancy<sup>15</sup> and Fiat and, to a lesser extent, Ford struggling somewhat. Non-U.S. transplant production initially involved Nissan's entry into Britain. However, Toyota and Honda have also recently established facilities. By the mid-1990s, Japanese transplant production capacity in Europe will exceed 500,000 units annually. A primary concern in these transplant locations is the continuing threat of trade retaliation and a stated EC policy to limit Japanese nameplates to a market share of 16 percent or less. (Current sales levels are still below this target.) The Big 3 have also added capacity due to stronger sales or, in the case of Chrysler, reestablishing a position in the market.<sup>16</sup>

#### *Japan*

Japan is the largest single country producer in the world in combined car and light truck production. Annual production levels by 1991 exceeded 13 million units annually. Almost 45 percent of this production (over \$65 billion a year) is exported and, consequently, Japan is the world's largest exporter of vehicles. Toyota, Nissan, Honda, Mazda, and Mitsubishi are the primary, but not necessarily the dominant, producers. Altogether, the domestic market actually is comprised of 10 manufacturers with pro-

duction above 500,000 units annually. Of greater significance is the fact that certain manufacturers, like Fuji and Daihatsu, have significant influence in important market niches.

In the extended outlook, Japanese production will be influenced by three primary trends. First, production of parts and some finished assembly are becoming more mobile, for example, moving toward offshore sites in Asia and other developing markets. Due to labor shortages and rising costs in Japan this trend seems inevitable as an alternative to domestic production. Additionally, offshore facilities provide a means of entry into an expanding global consumer market. Production can then include exports back to Japan, as well as some production for the local market. The potential growth of these non-Japanese Asian markets may be significant in the years ahead, and companies like Toyota and Nissan have attempted to anticipate their development.

Second, transplant operations in the U.S., Canada, and western Europe continue to increase capacity and plans for further expansion are in the works. Concern over political pressure, trade barriers, and economic considerations continue to push Japanese producers toward local production. As this trend continues, production in Japan will be reduced by falling exports which are being replaced by Japanese nameplate production in the States and western Europe. Unless exports from Japan find new markets, the impact on domestic Japanese production may be severe.

Finally, domestic Japanese production is evolving technically and moving increasingly toward luxury, mid-size, and sports models to suit the changing preferences of consumers. In an economically mature and aging domestic market, Japanese producers not only must grapple with sales stagnation but a changing product mix. Their technological gains in these areas also influence their export product mix and will continue to do so in the foreseeable future.

#### *Asia-Pacific region (excluding Japan)*

Non-Japanese Asian production in 1991 was almost 4 million units, a level which has increased tenfold in the last decade.<sup>17</sup> The fastest growing production area has been South Korean facilities, which produce almost 1.5 million vehicles annually. The birth of the Korean industry is relatively recent. The industry did not begin in earnest until almost 1980. However,

production has grown from 100,000 annually in the 1980s to a projected level of over 1.6 million in 1992. Production in Taiwan has also grown and now approaches half a million units annually. Assembly and parts facilities are also well established in Malaysia, Indonesia, and Thailand. Additionally, major facilities have been and are being added in India and China. Currently, production in these two markets exceeds 1 million units. Recent expansion in China, in particular, bodes well for production capacity.

Overall production in Asia has traditionally had an export flavor, with one-third of the production in this region destined for exportation. The trend is still strong in spite of the establishment of Japanese nameplate production facilities in Europe and North America. Non-Japanese markets are not as export oriented as Japan, although they are becoming more so. South Korea may be a reflection of the future; net exports of vehicles for the country are almost 400,000 annually, almost 30 percent of total production. Other nations in the region have not experienced such a share of export orientation. However, there does seem to be a learning curve, and once facilities are established, some export potential will likely exist.<sup>18</sup>

#### *Eastern and central Europe*

Almost all current production in eastern and central Europe involves inefficient state producers who are or will likely be disbanded. Current annual production has fallen to approximately 2.5 million units, with the CIS responsible for over 70 percent of combined vehicle production. The severe economic slump, combined with the break up of the centralized manufacturing system, has produced a contraction in production in the last two years that is likely to continue in the near term. The civil war in Yugoslavia and decline of the Yugo has also adversely affected the Yugoslavian economy, which was the second largest producer in the region prior to 1992. Over the long term, production will likely continue its trend away from state owned production to the private sector. One element is the inefficiency and quality concerns with traditional products like the Yugo, Trabants, and Ladas.<sup>19</sup> Increasingly, however, private sector production has come from western firms that have established bases in the region. BMW, Volkswagen, and GM all have major expansion efforts in former commu-

nist countries and production from these facilities should maintain or at least partially offset the decline in state companies which are being liquidated and/or downsized. Volkswagen's presence in Czechoslovakia is indicative of what the future may bring. The company is adding facilities to expand production to perhaps over 200,000 units annually; of this total, a portion will be exported to the West. This trend will likely continue as the relatively cheap skilled labor and the opening of new markets provides a magnet to U.S., European, and Japanese firms.

### *Latin America*

Currently, Latin America is an important producer, both for domestic consumption as well as for exportation. Of course, domestic content restrictions and other trade barriers have produced some distortions in domestic production. However, current production in excess of 2 million units annually generally reflects the comparative advantage of these areas as a low cost production base. Most of these units are produced in two markets, Mexico and Brazil, with a limited amount of assembly occurring in other markets. In Mexico, a million units are assembled annually, of which over 500,000 units are exported.<sup>20</sup> In Brazil, a combination of vehicle sales and exports are responsible for almost 1 million units annually. Brazilian production is not quite as export oriented as Mexico, primarily due to a larger domestic market as well as economic problems in the last twenty years.

Current production activity is increasing due to the rapid expansion of facilities. In fact, capacity estimates indicate that future expansion plans are accelerating, and production should continue to grow, especially in Mexico where a trade agreement with the U.S. should provide a stimulus to the market. Mexican capacity and, therefore, production have doubled in the last ten years. This expansion reflects the economic reforms in the country as well as the development of Mexico as an export center of certain models to the U.S. market. The competitive position of the Mexican production environment bodes well for expansion of production facilities in North America, especially due to the continued importance of the sales market.

U.S. and European firms are expected to continue the trend of the last twenty years by

increasing their production capacity in this region in order to breach the local market as well as provide exports to established markets. The potential for future growth also includes Japanese nameplates, which to date have had only a minimal presence (with the possible exception of Nissan). The domestic content provisions of the North American Free Trade Agreement may provide a strong impetus for auto plants locating in Latin American markets, principally Mexico.

### **Global trends and implications for Midwest auto producers**

Sales data for 1991 indicate the diversity of activities throughout the world and highlight the environment U.S. nameplates face as the decade progresses. In 1991, total vehicle sales in the world broke down as follows: 33 percent of all sales occurred in western Europe, 30 percent in North America, 15 percent in Japan, 8 percent in Asia, 7 percent in eastern and central Europe, 3 percent in Latin America, and the remaining 3 percent in the rest of the world. *Prima facie*, it would seem that the Big 3 would be well positioned in the world, given that almost two-thirds of all sales occur in North America and western Europe, their two traditional strongholds. Unfortunately, such a conclusion ignores developments discussed in this article. The most important concern is the fact that sales growth is accelerating in Asia (excluding Japan), Latin America, and eastern and central Europe where the Big 3 generally are not active, and decelerating in traditional Big 3 strengths: the U.S. and western Europe. At the same time the current market standing for firms in traditional markets is under stress from foreign competitors and, with the integration of the EC, competition should accelerate.

The prospects of a sluggish domestic vehicle market with intensifying competition at the same time developing markets are expanding abroad poses many questions for the Midwest. Whether restructuring and downsizing of domestic operations continue is, of course, at the forefront of these questions, especially if the Big 3 fail to penetrate new markets through expansion programs. Moreover, even foreign market penetration may be insufficient to supplement U.S. domestic development and employment, unless this penetration involves exports of U.S. made products.

Of greatest concern is the further employment and income erosion in the Midwest as Big 3 facilities are streamlined. Current employment in auto manufacturing is estimated at slightly over 800,000 jobs in finished and parts assembly. Projections of white collar support staff and retail distribution employees include an additional 500,000 workers. A large portion of these workers are in the Midwest, which is still responsible for nearly 60 percent of the assembled U.S. vehicles and is home to the headquarters of the Big 3. There is a strong probability of further economic restructuring in addition to the overwhelming adjustment which has occurred already. Since 1979 the domestic industry has closed numerous U.S. plants, pared production costs throughout the entire manufacturing process, and will eliminate more than 400,000 jobs by 1995. The impact of this restructuring has been especially severe in the Midwest. In Michigan alone, the Big 3 reduced their work force by more than 150,000 between 1979 and 1991. GM's planned job cuts through 1995 will reduce the work force in the state by an additional 25,000 jobs.

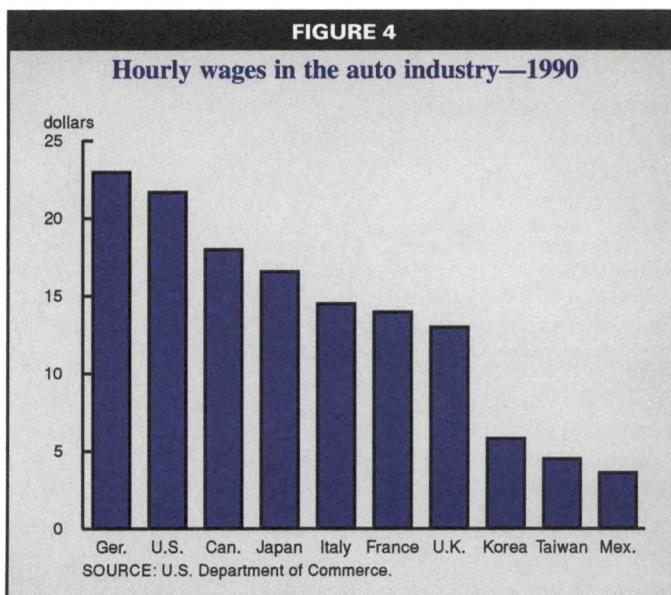
A weak sales environment intensifies the need to restructure and will likely prompt further efforts to speed up the adjustment. This factor will also likely encourage all producers, domestic and foreign, to explore new opportunities, many of which will be external to the U.S. market. Whether or not these opportunities are or will be available is likely to become a major issue which each manufacturer will have to address.

Future prospects resulting in adjustment of the current trade flow and stimulation of exports will be influenced by a variety of factors. Of primary concern are the following:

- 1) Continued improvements in U.S. manufacturing competitiveness relative to the international marketplace: U.S. manufacturing wages relative to the developed world have declined in the last decade. Additionally, productivity gains have been strong and, therefore, unit labor costs have improved in relative terms. However, the automotive segment has not experienced the

same improvement as other manufacturing sectors. As indicated in Figure 4, U.S. motor vehicle wages in 1990 were still one of the highest in the world and may not be fully offset by productivity differentials. Higher benefit costs push this differential higher, especially health care which is currently estimated at 20 percent of overall payroll costs for the Big 3.

- 2) Competitiveness relative to the developing world: as emerging markets reform their economies and integrate into the international marketplace, competition will intensify, especially in the new sales markets. These new markets are also a source of competition, and their wage rates may give them a competitive advantage compared to the industrialized nations. Overall wages in Mexico are currently one-seventh the U.S. level for workers in the motor vehicle industry, rates in Korea are still only one-fifth, and so on. Of course, productivity differentials and other factors are considerations in this environment. However, it is questionable whether or not the productivity differentials can or will account for such a wide difference of compensation.<sup>21</sup>
- 3) Regional and multilateral trade agreements: successful completion of the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT) round will impact the development of the industry by shifting some production activities between nations, and also by influ-



encing income growth, job creation, and other macroeconomic developments. Of course, the primary concern for workers in the industry is the potential increase of production shifting to Latin America which may be facilitated by NAFTA. Unfortunately, the impact of the agreement is not that easy to quantify; for example, the agreement would also open the Mexican market to U.S. exports and remove many of the current trade distortions. It is likely, however, that some labor in certain segments would be adversely affected, especially in the semi-skilled categories where the compensation differentials are the greatest. Segments affected may include the assembling of light trucks (which currently face a relatively high barrier) and some parts components. Of course, export potential also exists in more value added components.

- 4) Other trade developments: from an export standpoint, U.S. growth will be influenced significantly by domestic content rules, tariffs, quotas, and other political restrictions. Developing nations prefer to increase domestic production in lieu of importing significant quantities. The 2-for-1 rule of exports to imports which has been imposed in Mexico is an example of such policy. Future expansion into other non-North American markets, especially in Asia, will have to deal with such policies. Additionally, U.S. trade policies will influence the degree of competition in the U.S. from

abroad. Japanese voluntary export restraints are being bypassed by transplant production, but are such policies mandatory on Korean or other Asian production? These issues will impact nameplate activities in the U.S., especially the Midwest.

Over the long run, location of manufacturing facilities in the Midwest for domestic and/or export production depends on the costs of production, including shipping, trade restrictions, and location concerns, relative to other markets. In a competitive marketplace these pressures are felt much faster and to a greater degree than in insulated markets. Consequently, when evaluating further global integration and its impact on the Midwest one should also consider taxation, education and training, regulation, shipping fees, transaction costs, and overall production costs. These elements determine the competitiveness of the firm and will, in the long run, play an important role in determining location, production activity, and export growth for any industry. Overall, external growth and domestic restructuring will continue to be the dominant issue for the domestic auto industry, especially in the Midwest. The future for the motor vehicle industry is increasingly a global one, both in terms of production and sales, and hopefully U.S. industry can benefit and get in the game. Otherwise, change and the resulting economic pain for the Midwest in particular may be severe.

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## FOOTNOTES

<sup>1</sup>The Midwest is defined as the East North Central census region which includes Illinois, Indiana, Michigan, Ohio, and Wisconsin.

<sup>2</sup>Among other estimates the University of Michigan, Euro-motor, and the Commerce Department all conservatively estimate sales growth at this level. Estimates provided in this analysis have come from these sources.

<sup>3</sup>The recent sales declines may be a reflection of the general downward adjustment in the trend in auto sales. Demographic shifts, minimal income growth, and price increases may mean that further expansion in the market is unlikely. These factors may cause multiple problems for many producers, especially given the level of competition that already exists in the market.

<sup>4</sup>The expression "foreign nameplate" refers to vehicles produced by a company headquartered abroad. Production activity may well, and in fact does, occur in the U.S. For-

eign transplants refer to U.S. facilities of foreign nameplates. The initial development of transplant facilities began in 1982 when Honda established U.S. assembly facilities in Ohio.

<sup>5</sup>Domestic competition is also increasing. For example, Chrysler recently unveiled the first full sized model in two decades to compete with the highly popular Ford (F series) and GM (Chevy truck) models.

<sup>6</sup>Light trucks in this discussion exclude vehicles classified as Class 5 and greater.

<sup>7</sup>Recent EC rulings have encouraged the removal of auto trade restrictions within the community. These revisions are forcing significant changes within the Italian market.

<sup>8</sup>Regulatory procedures, specifically emission requirements, do encourage a higher replacement rate for autos than would otherwise be expected in a mature economy.

However, reduced prices for slightly used vehicles are beginning to put pressure on new car sales. Along with other adverse trends, one would expect only modest sales gains in the future.

<sup>9</sup>Conservative estimates of gross domestic product (GDP) in the dynamic Asian economies places growth at approximately 7 to 8 percent per year throughout the decade. Southeastern China, with a population equal to the U.S., has an economy growing at a 12 to 14 percent annual rate with industrial production growing in excess of 20 percent per year.

<sup>10</sup>Other elements are also important to support an expanding consumer market for vehicles. Infrastructure, especially roads and parking facilities, is an important factor. Additionally, there may be constraints on specific markets which will hamper growth. Hong Kong, for instance, because of space difficulties, has a very small vehicle market in spite of its relatively high income levels.

<sup>11</sup>One qualification to the claim of apparent market dominance by domestic producers to the exclusion of other manufacturers is that cross ownership stakes are significant and therefore other manufacturers successfully permeated markets through equity stakes. For instance, GM has a 50 percent equity stake in Daewoo, while Ford has a 10 percent equity stake in Kia Motors.

<sup>12</sup>See Ballew and Schnorbus (1992).

<sup>13</sup>Recent acquisitions have reduced the number of independent automakers, especially in Europe, where intense restructuring appears to be occurring. These acquisitions have not dampened the degree of competition in the marketplace. If anything, competition has become more aggressive recently.

<sup>14</sup>Note that U.S. nameplates have been relatively aggressive in developing light vehicles that combine the strengths of trucks with the ride and comfort of cars. Minivans and many sports utility vehicles possess these characteristics.

Domestic nameplates' market share have also been helped by import quotas and the 25 percent tariff levied on imported light trucks.

<sup>15</sup>The expansion by VW and GM has recently added capacity in excess of 500,000 units annually.

<sup>16</sup>Chrysler is building built a facility in Austria and is targeting production of at least 150,000 units annually.

<sup>17</sup>Overall, production in this region (including Japan) currently exceeds 17 million units annually and estimates of additions to current capacity indicate that, by the mid-1990s, production will be well in excess of 18 million units. An increasing portion of this production originates in more diverse areas, including Japanese transplant facilities in Asia. Additional capacity in mainland China, Thailand, and Indonesia may increase capacity above 18 million units by the mid-1990s. Given the difficulties in measuring existing capacity and additions to capacity, a reasonable forecast would place the level at more than 18 million units by 1995.

<sup>18</sup>As illustrated by South Korea, emerging producers may have difficulties in exporting to mature markets due to quality problems, trade restrictions, and other factors. However, low labor and other production related costs are an offsetting factor in export growth to other emerging markets.

<sup>19</sup>Production of the Yugo and Trabant has been disrupted by current events. Production of the Lada is still occurring at the Nizhny Novgorod facility, an industrial behemoth employing 160,000 workers.

<sup>20</sup>Some Mexican exports are the result of 2-for-1 import requirements. However, in general the exports reflect the cost effectiveness of Mexican labor.

<sup>21</sup>Note that product quality is a major concern with regard to foreign manufacturing locations. These concerns may offset other competitive disadvantages.

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# Trends and prospects for rural manufacturing

William A. Testa



Manufacturing has become the primary economic base for many nonmetropolitan counties in both the Midwest and in the rest of the nation. At the same time, services, retail, and other industries are abandoning remote counties and are centralizing their operations in urban areas (see Figure 1). While the farm sector's health has now stabilized following the downslide of the early 1980s, farm jobs—especially those as a full time occupation—continue to disappear as the average size of a farm needed to support today's American family continues to grow larger. In sum, as one writer has put it, "many small rural towns ... have been transformed from farm service centers into minor cogs in the national manufacturing system."<sup>1</sup>

Manufacturing's importance to rural areas has been growing for several decades and it will probably continue to outpace other "basic" industry sectors in the rural Midwest. However, several forces of change, which began or continued to unfold in the 1980s and which are expected to continue into the 1990s, are not so favorable. These changes impacting rural manufacturing are threefold. First, manufacturing is undergoing a transition from traditional assembly line modes of production, that is, from "post-Fordism," to what is being called "flexible manufacturing" or "just-in-time." This change in the organization and mode of production is believed by some to favor urban locales over rural areas as production sites. Secondly, rural manufacturing differs from its urban counterpart in being more production oriented and

less service oriented in the particular activities that manufacturing companies perform. (Service activities of manufacturing companies include corporate headquarters, general administration, and R&D). However, because U.S. manufacturing companies are becoming more service oriented, it is expected that manufacturing in rural areas will not fare as well. Finally, ongoing negotiations among Mexico, Canada, and the United States are moving toward a tariff free trading area perhaps as early as 1993. As a result, low skill or low value added jobs (which tend to be found in rural areas) are those that are more likely to flee U.S. borders to Mexico.

## The changing economic base of nonmetropolitan counties

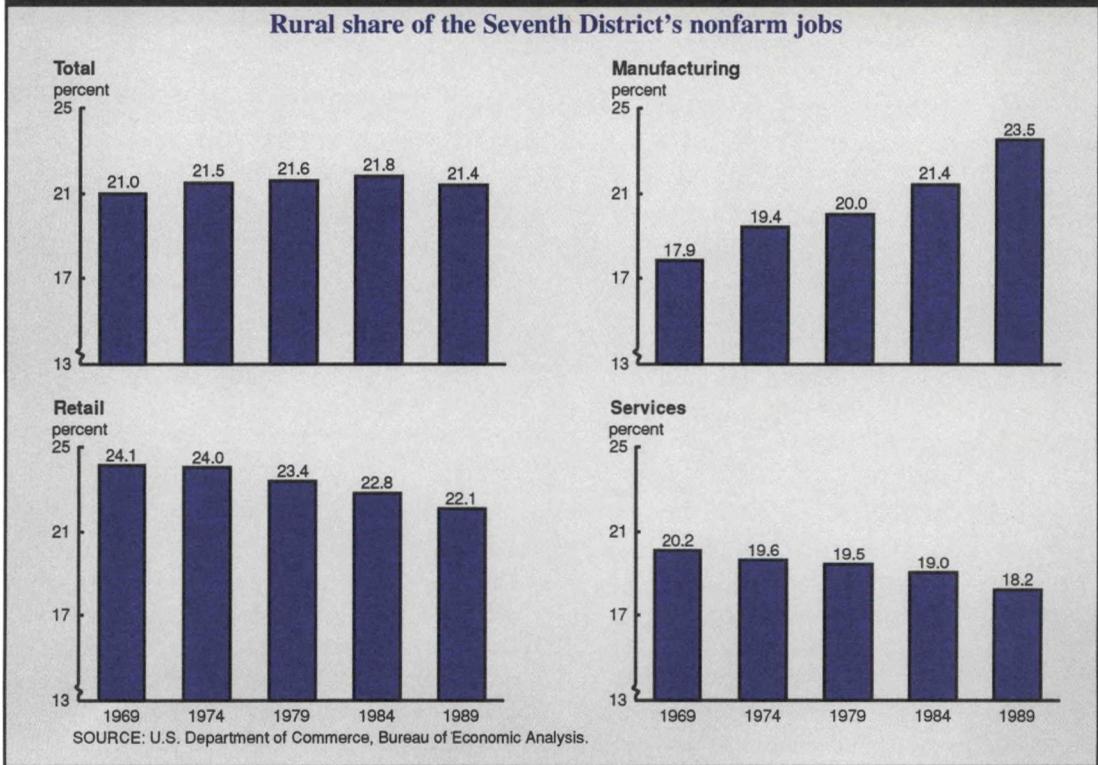
The primary challenge to rural areas during this century has been to replace jobs lost by the declining labor force needs of natural resource industries. As productivity climbs in farming and mining, or as natural resources are exhausted in forests and fisheries, the movement of labor into other sectors or the outright loss of jobs is the result.

In many regions, the decentralization of manufacturing from urban areas to rural areas has partly replaced jobs lost in other rural industries. Coupled with population decline in rural areas, per capita income in metropolitan and nonmetropolitan counties in the U.S. converged during most of this century.<sup>2</sup> On average, per

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FIGURE 1



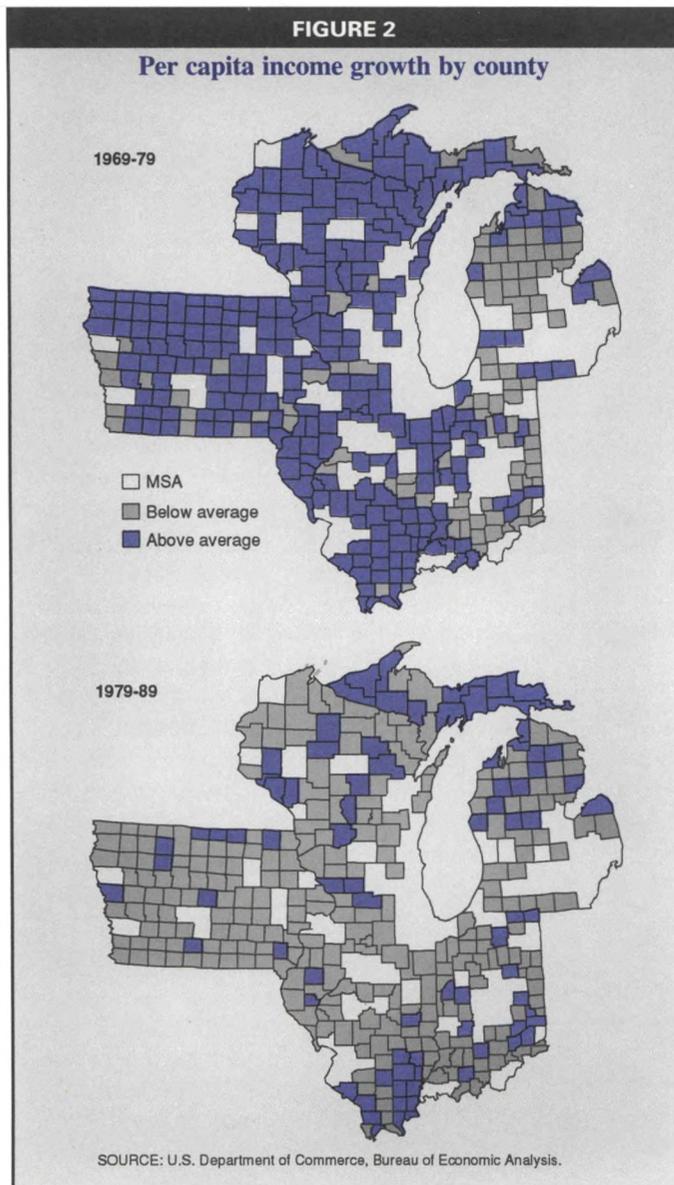
capita income growth in rural counties outperformed urban counties in the 1970s in the Seventh District states of Illinois, Indiana, Iowa, Michigan, and Wisconsin. Prosperity in natural resource industries during the 1970s, especially agriculture, was accompanied by stable or slightly growing employment in manufacturing.

The convergence of rural and urban per capita incomes in the Seventh District came to a halt during the 1980s as both agriculture and natural resource industries such as mining, energy production, and forestry fell on hard times (see Figure 2). Manufacturing located in urban and rural areas alike also suffered during the 1980s despite the fact that rural performance continued to outpace urban performance in job creation in both the Seventh District and the nation (see Figure 3).

Outperformance by rural counties (in the U.S.) in manufacturing job growth has been shown to date back at least to the 1950s and 1960s [Carlino (1985)]. Moreover, the contention that rural manufacturing job growth merely represents a urban spillover effect of manufacturing jobs to outlying counties has also been found to be either mistaken, inconclusive, or at least not pervasive from decade to decade

[Carlino (1985); Haynes and Machunda, (1987)]. Those rural counties that are not even adjacent to metropolitan areas have been found to be experiencing buoyant or above average manufacturing job growth. This experience was replicated in Seventh District states (see Table 1). From 1969 to 1990, the rate of job growth in nonadjacent nonmetropolitan counties exceeded not only growth in metropolitan counties but adjacent job growth as well.

The causes of this reorientation of manufacturing from large urban areas to rural areas are not difficult to trace. As U.S. factory productivity increased sharply during this century, manufacturing no longer required as many workers. More modest "factory neighborhoods" of workers could be gathered on a smaller scale in rural areas than those previously needed in large cities. In addition, the assembly line methods of production which gathered momentum following Henry Ford's success in automotive production required more space to organize production efficiently. Accordingly, the multistory urban factory increasingly gave way to one story sprawling production buildings. But this also meant that the cheaper land costs of suburban and rural sites



became more important in the production cost equation. Finally, the transportation system changed from rail lines converging on a central terminus—for example, Chicago—to a grid of interstate highways reaching deep into remote areas such as Appalachia and Texarkana. Rather than shipping manufactured goods from a central rail terminal such as Chicago, a remote branch plant could serve wide market areas almost as well. At the same time, the evolution away from producing heavy manufactured goods such as steel (which required bulky inputs of coal and ore), and toward lighter goods such as computers and plastics, also dispersed manufacturing toward rural locales because the

transportation penalty of remoteness was no longer so severe.

The upshot of these changes has been that, as manufacturing job growth in rural counties outpaced growth in the large urban areas, manufacturing has become a staple of the job composition in rural counties. In the Seventh District for example, manufacturing's share of total employment in non-metropolitan counties exceeds its share in metropolitan areas (see Figure 4). Rural counties in the Seventh District states have a larger share of manufacturing in comparison to their U.S. counterparts; manufacturing employment in rural District counties accounts for 19.2 percent of total employment versus 17.2 percent nationally.

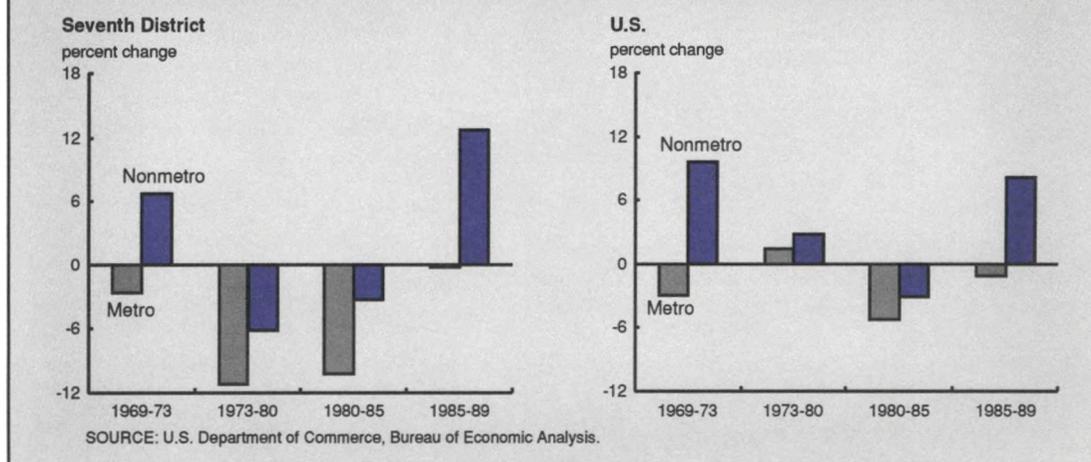
Not all nonmetropolitan counties have fared well in the 1980s with regard to manufacturing job growth (see Figure 5). This suggests that active development policies in rural areas may be needed if this growth is to be realized. This is especially so owing to several trends that may be working against the rural edge in manufacturing: the movement toward flexible manufacturing, the further opening of the U.S.-Mexico border, and the increasing service orientation of U.S. manufacturing.

### **Manufacturing and services**

Many of the same forces affecting the location decisions of service firms—especially the so called business services or producer services—also have a bearing on manufacturing companies. The reasons for this are that, aside from plant production activities, many activities of manufacturing companies are service activities such as research and development, design, management, sales, and distribution [Israilevich and Testa (1989)]. To varying degrees, manufacturing industries and companies can be thought of as an amalgam of service and production activities so that those locational forces that motivate service companies will, to varying degrees, also motivate manufacturing companies. By the same token,

**FIGURE 3**

**Growth in manufacturing employment in the 1970s and 1980s**



service activities and production type or plant type activities will respond to differing location pulls. As a result, the service intensity of any particular manufacturing company or industry will help to determine its location preferences.

Service industries—especially the rapidly growing (and higher paying) “producer service industries” such as advertising, specialized finance, and management consulting—have thrived and concentrated in large urban areas rather than in rural counties [Testa (1992a)]. Similar to producer service jobs, nonproduction jobs of manufacturing companies have come to favor more urban areas over rural counties. A look at nonmetropolitan counties in the Seventh District shows that, in comparison to the 47 percent nonproduction payroll of manufacturers in the U.S., rural District counties hover at just over 30 percent in nonproduction payroll (see Figure 6).

According to recent studies, improvements in telecommunications technology such as facsimile machines, teleconferencing, and other fiber optics transmission have probably strengthened the advantages of large urban areas over rural counties. These improvements are proving to be complements rather than substitutes for centralized business service provision, that is, it is now easier to transmit or deliver services to remote locations; and more efficient to do so from a centralized and (usually) urban locale.

At the same time that producer service activities are growing in stature—especially in urban areas—the actual activities and jobs of manufacturing companies are becoming more service oriented. Production or so called blue collar jobs inside of manufacturing companies continue to dwindle at the same time that jobs such as R&D, clerical, computer programming and data processing, advertising, accounting, and strategic planning are becoming more plentiful. Nonproduction payroll by manufacturing companies in the United States has increased from 39 to 49 percent over the 1972-90 period.

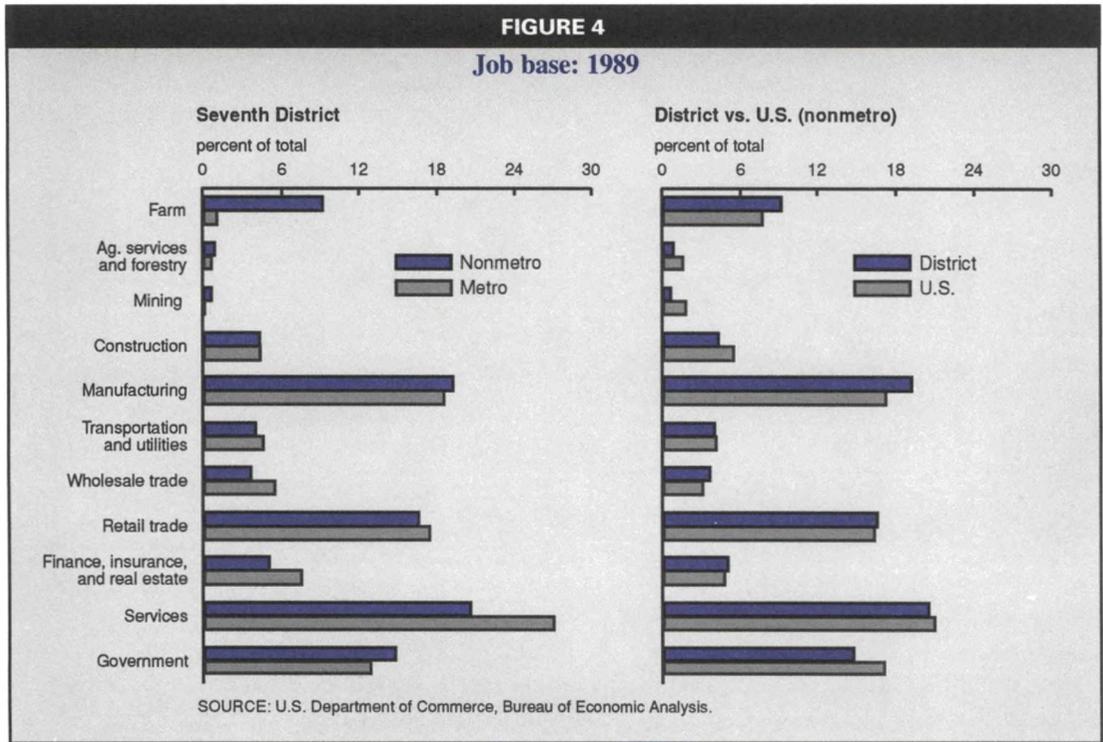
The trend toward greater service orientation among manufacturers, coupled with the impetus to concentrate service activities in large urban areas, have exerted a drag on the expansion of manufacturing employment in rural areas during the 1980s. Drawing on data from the Census Bureau from 1980 to 1988, McGranahan (1991) finds that a significant shift in job composition occurred in nonmetro-

**TABLE 1**

**Job performance in manufacturing in Seventh District states (percent)**

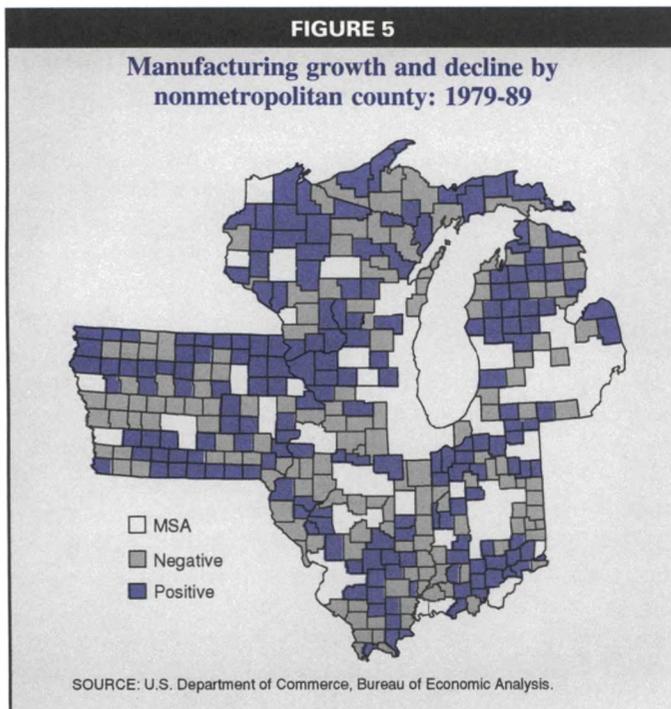
	1969-79	1979-90	1969-90
Metropolitan	-2.7	-17.8	-20.0
Nonmetropolitan			
Adjacent	8.6	-1.9	6.4
Nonadjacent	12.8	1.7	14.7

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.



politan versus metropolitan areas within the manufacturing sector. Within nonmetropolitan counties, management-research and support type jobs declined while production jobs increased slightly. In contrast, management-research jobs in metropolitan counties soared (by over 30

percent) while production jobs fell by over 10 percent. By implication, insofar as such production jobs are becoming a smaller share of employment in manufacturing, production activities will be less capable of buoying income and employment in nonmetropolitan counties.

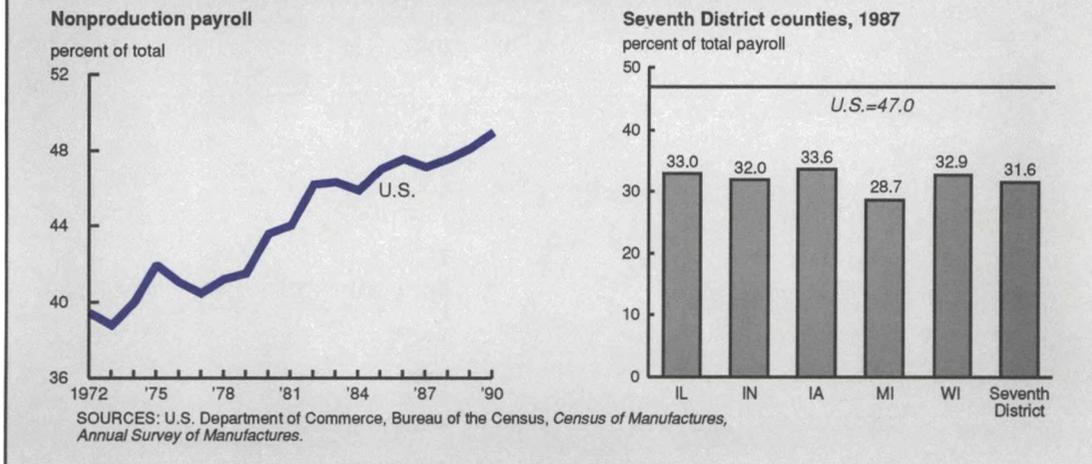


### Flexible manufacturing

Manufacturing industries are reportedly changing their management and production methods towards “flexible manufacturing,” which is also referred to as “flexible specialization” or “just-in-time” [Piore and Sabel (1983); Scott (1986)]. The U.S. auto industry is perhaps the most prominent industry that has adopted new organizational techniques which are predicated on Japanese innovations. GM, Chrysler, and Ford have adopted these technologies through joint ventures with Japanese car makers (Toyota, Mitsubishi, and Mazda, respectively) and are now adopting many organizational changes throughout their firm or at least within divisions (for example, Saturn of GM). In addition, other U.S. industries,

FIGURE 6

Nonproduction payroll in manufacturing



including photocopiers, cameras, and calculators, have changed their relationships with suppliers following the Japanese prototype [Linge (1991)].

Many features have been used to characterize flexible manufacturing, and there is no universally accepted definition. Perhaps the most prominent characteristic is that flexible manufacturing involves smaller production runs and a more varied or customized product. However, the processes by which these results are achieved are equally descriptive of flexible manufacturing. Innovations in the organization of design and production allow this customized small batch production to be carried out quickly, at low cost, and with high quality.

Some of the organizational features include close relations between firms and their suppliers. In general, flexible firms maintain relationships with a smaller number of key suppliers. In addition, the supplier relationship can be characterized as closely knit and cooperative with regard to capital investment, sharing of technology, and input to design, rather than purely contractual in nature. Another key feature is the maintenance of "lean" inventories and the use of "just-in-time" delivery of inputs and parts.

With regard to labor, there is less hierarchy and more participatory organization of employees, ranging from the production line to management and sales activities. Often, employees are trained to perform many jobs rather than the single routinized activity which characterized many assembly lines of yesteryear. There is

also a technological side to flexible manufacturing. Flexible manufacturing systems equipment can change the production line set up (including tools and dies) in short order. These systems must be manned by highly skilled and trained workers.

Some analysts believe that the adoption of these production methods will work to the disadvantage of manufacturing in rural areas. For one reason, skilled and high wage labor tend to gravitate toward urban areas because skill demands are higher there. In addition, flexible manufacturing implies a smaller scale of operation so that there is a lesser need for cheap and plentiful rural land. Finally, the greater need for communication/innovation among employees in flexible firms, especially those that are highly innovative and technologically oriented, may favor urban areas where the flow and exchange of information can be conducted on a greater scale and at lower cost. Close proximity also promotes close and cooperative relations between assembly operations and key suppliers, and cuts down on delivery and inventory costs. Accordingly, manufacturing activity may tend to concentrate into centralized nodes rather than locating in isolated rural areas.

Despite these disadvantages, there is also a growing body of argument and evidence to suggest that rural areas will not necessarily wither because of the technological transition toward flexible manufacturing systems. First, the alleged benefits of close and dense proximity as it relates to flows of information may not

be universal. Experience in other countries such as the peripheral Jutland area of Denmark [Hansen (1991)] has illustrated that a critical mass of interlinked and cooperating manufacturers who practice flexible methods can be assembled in rural areas.<sup>3</sup>

Close physical proximity has also been cited as advantageous because it facilitates just-in-time delivery of parts and components from suppliers, and thereby economizes on delivery and inventory costs. However, a “growing separation of assembly plants from their subcontractors has also been facilitated by the parallel growth of specialist freight handling firms with national and international multimodal networks which have considerably reduced the tyranny of distance.”<sup>4</sup> In comparison to most other industrialized nations, many rural regions of the Midwest have access to the interstate highway system which greatly shortens the time and distance from rural factories to their markets.

With regard to the skilled labor advantages of urbanized areas, the case can be argued that the new (flexible) production and organizational techniques actually favor rural areas over urban counties. That is partly because the need for flexibility in work assignments may be difficult to achieve in urban counties where the influence of strong labor unions may resist flexible work assignments. For example, in the American Midwest, Knudsen, et. al. (1991) report in a series of case studies that unions dislike “flexible labor cells” (where the labor resource is maximized in production) because they are viewed as threatening to the seniority system and are thought to be a device to encourage “speed up” of the work process. Indeed, the location decisions of many Japanese manufacturers (who were among the pioneers of flexible methods) such as Honda at Marysville and East Liberty, Ohio, and especially Toyota at Georgetown, Kentucky, have favored rural (less union oriented) locales.

Nor has it been established with certainty that there is any underlying rural skills deficit which would act as a labor supply impediment in the location decision of flexible manufacturers. Statistics reporting years of education completed do show that the adult population of U.S. nonmetropolitan counties is below the national average; but this does not necessarily reflect a shortage of skilled workers. Rather, the lower stock of educational attainment may

reflect a historical lack of skilled job opportunities in rural areas which has induced a migration of younger and educated workers out of rural areas and into large urban areas. McGranahan and Ghelfi (1991) review the evidence of the rural economic stagnation of the 1980s against the backdrop of the increased national demand for educated workers during the 1980s. The authors conclude that lagging rural job growth was not driven by faltering labor supply in rural areas but rather that a surging demand for skilled workers occurred in *urban areas* which accelerated rural outmigration and widened the rural/urban wage gap. Furthermore, the educational gap between nonrural and rural areas is significantly larger for those with a college education than for those with a high school education [Swaim and Teixeira (1991)]; the latter is most likely to be the level of education which manufacturers would tend to demand of prospective production workers. Moreover, the authors report that the shortfall for high school completion rates of adults in rural areas has been falling—from 8.1 percentage points in 1971 to 4.4 percentage points by 1987.

Likewise, while national statistics report lagging academic achievements of rural students, there is much variation across regions, with the rural South largely accounting for the smallest percentage number of high school graduates. In the Midwest, Swaim and Teixeira (1991) report that high school drop out rates among 18-21 year olds in nonmetropolitan counties were below both metropolitan and nonmetropolitan counties of the Northeast, West, and South in 1985. High school graduation attainment rates for Seventh District states reveal that nonmetropolitan counties are not much different in producing high school graduates in comparison to both its own urban areas and to national averages.<sup>5</sup>

While these arguments suggest that the change toward flexible manufacturing need not be an insurmountable obstacle to continued manufacturing growth in rural areas, formal evidence to date indicates that it has already impeded rural manufacturing growth in selected industries.<sup>6</sup> Barkley and Hirschberger (1992) have examined 106 metal working industries over the 1981-86 period. Their findings suggest that those industries that were restructuring toward flexible specialization were less likely to locate in rural locales, especially among the

more high technology or rapidly growing metal working industries. With regard to rural development policy, the authors caution that rural areas with competitive advantages will be those that are more amenable to flexible manufacturing characteristics such as good transportation, developed communications, high labor skills, and the absence of a labor force culture steeped in older and rigid manufacturing methods.

### North American Free Trade Agreement (NAFTA)

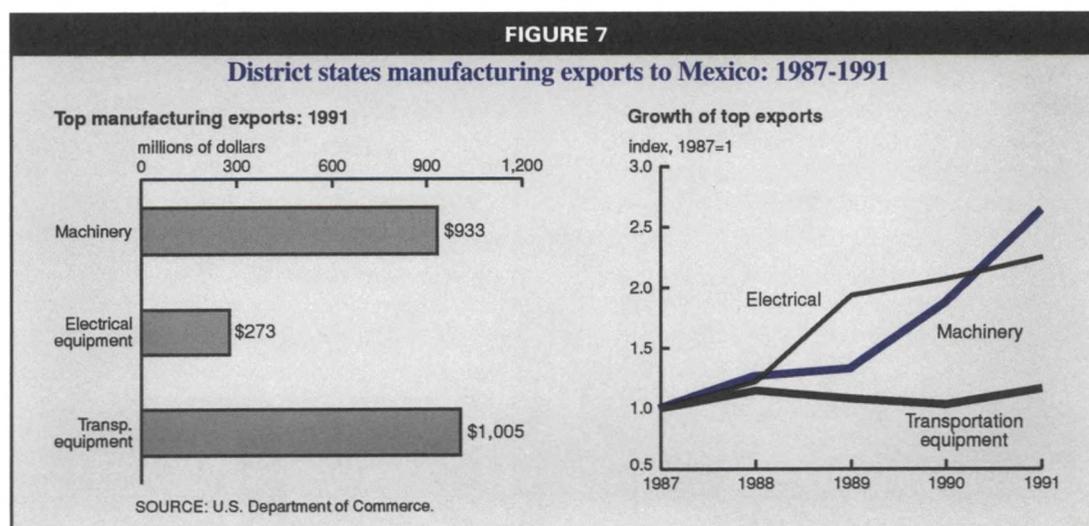
Despite the recent efforts of the aforementioned manufacturers to locate state of the art technology plants in rural areas, the particular types of manufacturing activity that have historically located in rural areas tend toward the lower skilled and production activities. Though it need not be the case, rural areas have been a haven for those manufacturers searching for low production costs [Norton and Rees (1979)]. That is, manufacturing in the U.S. has followed the so called spatial product cycle, which generalizes a manufacturing product's progress from inception to standardization. At inception, products are either new or are produced with innovative processes; at this stage, the products are produced initially near large urban areas where innovation allegedly has a stronghold. As the product and its production are routinized, standardized, and generally "de-skilled," and as the scale of production increases as the product gains wide market acceptance, the location of the production process is shifted out toward more rural locales (or overseas)

	1982	1985	1987	1989	1991
United States	11.64	12.96	13.40	14.31	15.45
Mexico	2.54	2.09	1.57	2.32	2.17

SOURCE: Bureau of Labor Statistics, Report 825.  
\*Includes all payments made directly to the worker, before payroll deductions, but including employer expenditures for legally required insurance programs and contractual and private benefit plans.

where production costs are lower (and needed skills or access to technology are fewer).

To the extent that this paradigm is accurate, it implies that the proposed NAFTA is less favorable for rural areas. Because average wages and labor skills in Mexico are lower, those U.S. jobs most likely to flee to Mexico would be the lower wage, lower skill, non-service type jobs—exactly those types that tend to concentrate in rural areas. Table 2 reflects the large wage differences between the nations for production workers (unadjusted for skill differences). The hourly wage premium for the U.S. as a whole is as large as 6 to 7 times that in Mexico. In all fairness, it should be noted that workers with certain production skills may not be available in Mexico at these lower wages. Moreover, the advantages of lower transportation costs and highly developed physical infrastructure favor U.S. locales. However, these advantages probably do not favor U.S. rural



locales over Mexico to the same extent as U.S. urban locales.

This is not to say that NAFTA will not be a net plus for rural counties, but rather that urban counties may be the greater beneficiaries. Mexico's tariffs on U.S. exports are two or three times greater than U.S. imports from Mexico so that Midwest manufacturing as a whole may gain from NAFTA passage.<sup>7</sup> This is especially true given the surging economic growth and demand for imported capital goods which Mexico has recently displayed. From 1987 to 1991, nonelectrical machinery exports to Mexico from the Seventh District states increased by two and one-half times (to almost \$1 billion) while exports of electrical equipment increased by a multiple of 2.25. These capital goods are just the type of goods—machinery and electrical equipment—that concentrate in the Midwest and which could experience a further growth in demand arising from NAFTA's spur to Mexico's growth and development (see Figure 7). A rapidly developing Mexico will undoubtedly require growing machinery investments both for factories and for construction. Rural counties in the Midwest would tend to benefit as well, but these benefits would be diluted by the fact that machinery establishments are not highly concentrated in rural counties in the Seventh District, but instead tend to concentrate within the large metropolitan areas.<sup>8</sup>

### Conclusion

Despite the possible negatives working to slow rural gains in manufacturing employment—increasing service orientation of manufacturing companies, the movement of lower skilled production jobs to foreign countries such as Mexico, and the adoption of flexible manufacturing methods by domestic compa-

nies—these forces have not been strong enough to hold back the tide of manufacturing growth in rural areas to date. Over the course of the 1980s, rural manufacturing in the Midwest continued to outpace urban counties. From 1985 to 1989, metropolitan counties' manufacturing jobs declined by 1.1 percent while rural counties gained by 8.2 percent. In the face of such a strong growth difference, it is difficult to imagine any reversal of fortunes. Moreover, increasing Midwest manufacturing growth in general shows little sign of abating during the remainder of the 1990s as export growth will continue to be strong while the region will suffer little of the fallout from America's defense reduction. As a result, the continuing stabilization, if not recovery, in many agriculturally oriented regions in the Midwest should continue to be helped along by rising manufacturing fortunes.

However, the experience of Seventh District states in the 1980s also suggests that not all rural counties will realize manufacturing job growth in the 1990s. Those who conduct development policies in rural areas will need to be aware of potential difficulties (such as those discussed above) in assisting the growth and expansion of manufacturing in rural areas.

In addition, not all manufacturing industries will find rural areas attractive. The experience of the 1980s shows widely divergent shifts in the Seventh District in the urban versus rural patterns of growth of establishments by individual manufacturing industries.<sup>9</sup> For reasons such as these, some analysts have suggested developing information on the relative costs and productivity of individual industries in urban versus rural locations [Martin, et. al. (1991)]. The somewhat less sanguine outlook for rural manufacturing in the 1990s makes this idea more appealing as a way to concentrate scarce development dollars for maximum impact.

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### FOOTNOTES

<sup>1</sup>See John Fraser Hart (1991), chapter 3, p. 32.

<sup>2</sup>See McGranahan and Ghelfi (1991).

<sup>3</sup>See Hansen (1991) for a discussion. Hansen cites Lego Co. (maker of the plastic toy blocks) and Bang & Olafsen Co. (maker of consumer electronics products) as examples of successful firms in Jutland. Also, see "Small, flexible plants may play crucial role in U.S. manufacturing," *Wall Street Journal*, January 13, 1993, p.1.

<sup>4</sup>See Linge (1991), p. 327.

<sup>5</sup>See Testa (1992b), p. 11.

<sup>6</sup>See also Glasmier (1991).

<sup>7</sup>See U.S. Dept. of Labor (1990).

<sup>8</sup>See Testa (1992b), p. 27.

<sup>9</sup>Ibid.

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