

# The 1982 Mexican peso devaluation and border area employment

*Unemployment in U.S. border areas peaked in 1982 after the devaluation of the Mexico peso; increased manufacturing employment on the Mexican side adds to the number of Mexican consumers for U.S. purchases, creating more retail and service jobs on the U.S. side*

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Regional economies are affected by business conditions in neighboring regions. Levels of disposable income and consumer preferences in external markets can influence which industries locate in a region, and economic circumstances in neighboring regions may affect local levels of personal income and employment. These conditions are illustrated by the recent economic trends along the U.S.-Mexican border. Increased manufacturing employment in Mexico expands the number of Mexican consumers able to purchase U.S. goods and services, which in turn creates conditions favorable for growth of retail and service jobs on the U.S. side.

In the U.S.-Mexico border region, a major influence on the local economies is the presence of two foreign countries at different stages of development. The 1,933-mile U.S.-Mexican border<sup>1</sup> is the world's longest political boundary separating a developing nation from a more fully developed industrial nation. The border regions have had to cope with two sets of national aspirations and development strategies which often affect existing economic relationships. Economic expansions and contractions are influenced not only by swings in the business cycle, but also by decisions made by either Government.

This article is an analysis of events—specifically the 1982 peso devaluations—that resulted in depressed economic ac-

tivity in the U.S. southern border areas. The article looks at two concentrated and rapidly growing industries—manufacturing and retail trade—to determine why dependencies between U.S. border regions and their Mexican neighbors eventually led to regional economic crisis. It does not directly examine the national implications of border area development, such as shifts of manufacturing operations from other parts of the United States to Mexico.

Employment by industry from the Covered Employment and Wages Program of the Bureau of Labor Statistics<sup>2</sup> is used to analyze local area industrial concentration and growth between 1978 and 1980. Location quotients and shift-share components are computed and used to evaluate pre-devaluation economic conditions and trends. (See the appendix for details of these techniques.) The local areas studied are either counties or single-county Metropolitan Statistical Areas. Establishment survey data are used to review post-1982 developments.

## **The Mexican economy, 1978–82**

On the Mexican side, the pace of economic development increased in 1978 when Mexico began to earn large revenues from oil exports. These modernization efforts required the importation of large amounts of capital goods and intermediate products financed largely by petroleum exports and foreign loans. However, in the early 1980's, international oil markets became oversupplied because of the drop in energy demand brought on by the world recession and price-

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induced conservation. Mexico experienced a sharp decline in export revenue, and the underlying conditions for the coming financial crisis were set.

When its ability to obtain foreign exchange weakened, Mexico was forced to increase its foreign debt simply to meet obligations from past financial arrangements. Pressure on the Mexican Government to encourage exports and discourage imports increased, and the peso was devalued in February 1982. The resulting decrease in Mexican demand for U.S. goods and services, in combination with the imposition of exchange controls, caused U.S. border employment to decline.

### The *Maquiladora* Program

The Mexican *Maquiladora* Program, initiated in 1965 to stimulate the development of Mexican border areas, is a large source of foreign exchange and border area manufacturing employment. *Maquiladoras*, which are small, labor-intensive assembly plants, are an important source of income for many Mexicans. The increase in the disposable income of Mexican workers resulting from the program has also affected the industry mix on the U.S. side of the border.

The *Maquiladora* Program developed from a series of U.S.-Mexican agreements entered into after the end of the U.S. *Bracero* Program in 1965. (The *Bracero* Program regulated the flow of seasonal Mexican agricultural labor into the United States.) Another important predecessor of the *Maquiladora* Program was the National Border Program, which provided jobs developing infrastructure—such as roads and railroad sidings—needed to attract both domestic and foreign investors.<sup>3</sup> Using the facilities built by the National Border Program, the *Maquiladora* Program encouraged U.S. firms and Mexican entrepreneurs to build manufacturing plants in Mexico and to produce goods for the U.S. market. *Maquiladora* firms are allowed to import intermediate products and raw materials into Mexico without tariff charges. The only tax or duty incurred by these firms is charged when the products re-enter the United States. A value added tax is applied to that part of the product produced in Mexico.<sup>4</sup>

### Impact of *maquiladoras* on U.S. manufacturing

Because of their dependence on the U.S. market, most *maquiladora* plants are located within 20 kilometers of the U.S. border, primarily in densely populated areas with highly developed infrastructures. In general, twin Mexican and U.S. plants exist, each responsible for different parts of the production process. The Mexican operations, which on average have a production work force of 75 to 80 percent women between 19 and 23 years old, perform the less skilled, more labor-intensive tasks, while the U.S. plants perform more capital-intensive jobs requiring higher skill levels. The main border areas where *maquiladora* plants are located are Tijuana-San Diego, Nogales-Nogales, Ciudad Juarez-El Paso, and Matamoros-Brownsville.<sup>5</sup> *Maquiladora* operations primarily produce apparel, leather, furniture, food and drink,

machinery, electronics, transportation equipment, and chemical products.<sup>6</sup>

The popularity of this program with U.S. businesses is attributable to the cost advantage of using less expensive Mexican labor. Mexico's proximity to the U.S. market makes its wage structure competitive with the low wage levels found in Hong Kong, Taiwan, and South Korea. For example, at the October 1983 exchange rate, an average compensation of 90 cents per hour was paid to workers in *maquiladora* firms. This average includes benefits required by Mexico's Federal Labor Law such as social security contributions, education taxes, maternity leave, employee housing, day care assistance, and state payroll taxes.<sup>7</sup>

The effect of increased *maquiladora* activity on manufacturing employment on the U.S. side of the border is illustrated by the location quotients in table 1. A location quotient greater than 1 indicates that an industry accounts for a higher proportion of total employment in the county than in the State. Hence, the higher the location quotient, the more concentrated the industry is in the county relative to the State. Certain types of manufacturing industries are more attracted than others to U.S. border counties. Industries with the highest location quotients in U.S. border counties are apparel and food products manufacturing. These same industries are also known to be well suited to *maquiladora* operations in Mexico.

Apparel manufacturing is highly concentrated in Santa Cruz (AZ), El Paso (TX), Cameron (Brownsville, TX), and Hidalgo (McAllen, TX) Counties. In El Paso County, the ratio of apparel manufacturing to total employment is eight times that of the State for this industry. Clearly, apparel manufacturing is a dominant industry there. In the other counties, the respective location quotients for apparel manufacturing are also significant—ranging from 3 to 6.

To determine why certain industries are so dominant in U.S. border areas, shift-share components are shown in table 1. The actual industry employment change observed

County	Industry	Employment change				Location quotient
		Actual	Effect of shift-share by			
			State-wide	Industry mix	County share	
Santa Cruz (Arizona):	Apparel . . . . .	7	28	-48	28	5.9
San Diego:	Electrical . . . .	6,885	1,138	1,027	4,716	1.0
	Transport. . . . .	4,465	2,019	39	2,406	1.6
Cameron (Brownsville):	Apparel . . . . .	276	297	-307	285	3.7
El Paso:	Apparel . . . . .	2,225	1,638	-1690	2,277	8.4
Hidalgo (McAllen):	Food . . . . .	586	267	-244	563	7.3
	Apparel . . . . .	874	251	-260	882	3.2

<sup>1</sup>Location quotients indicate the extent of industrial specialization present in a region at a point in time and are computed from 1980 annual averages.  
<sup>2</sup>Shift-share components isolate explanatory growth factors and are computed using 1978 as the base period and 1980 as the end period.

is a function of three factors: the statewide effect (normal growth); the industry mix effect (growth because of a preponderance of dynamic industries in the local area); and the county share effect (growth for reasons that are specific to the local area).

In the four border counties with significant proportions of employment in apparel manufacturing, the industry mix effect is negative while the county share effect is positive and large relative to the total change in the industry's employment. This may indicate a general shift in the industry's locational preference from other parts of the State to the border region, apparently for county-specific reasons.

Other border counties show similar trends. In San Diego County, CA, the manufacture of electrical components and transportation equipment provides employment to a significant share of the county's labor force. These industries are also significant in other locations in the State as evidenced by a location quotient close to 1. The positive industry mix effect indicates that these industries have growth rates exceeding the State average for all industries. San Diego County, however, has a rate of growth in these industries far above the State growth rate. This may imply that, for county-specific reasons, San Diego is attracting a larger share of the State's electrical component and transportation equipment manufacturing activity.

The rapid growth in manufacturing employment in U.S. border counties over the study period is partly because of the success of *maquiladora* industries in neighboring Mexican communities and the emerging twin-plant concept. Of the 594 *maquiladora* assembly plants employing more than 156,000 workers by November 1983, 94 percent of the plants were located in the 20-kilometer zone adjacent to the U.S. border.<sup>8</sup> This is strong evidence that increasing economic relationships and interdependencies are developing between manufacturers in the United States and Mexico.

### **Retail trade**

Historically, a symbiotic relationship has existed between U.S. and Mexican citizens living along the border. According to the 1980 census, 8.7 million U.S. citizens are of Mexican ancestry.<sup>9</sup> Many of them live in the border communities of the Southwest. The extensive social networks existing between Mexican nationals and U.S. citizens of Mexican origin have reduced political and physical barriers to commerce. Differences in language and custom have not deterred Mexican nationals from patronizing U.S. merchants.

In fact, U.S. retailers located along the border increasingly depend on peso customers. During the U.S. recessionary period of 1980 and 1981, Mexican purchases of U.S. goods and services helped insulate border area retail trade from the domestic downturn. Some economists estimate that prior to the 1982 devaluations, 60 percent of goods consumed in Mexican border towns came from the United States.<sup>10</sup>

Given barriers such as lack of familiarity with shopping facilities and higher travel costs, why is it that large numbers of Mexicans, wealthy and poor, have entered this country to purchase goods and services, many of which are also available in Mexico? Several consumer surveys of Mexican outshoppers (Mexican citizens who frequently shop in the United States) were conducted prior to 1982. Survey findings indicate that Mexican consumers generally believe that U.S. merchants have a greater selection of higher quality merchandise and offer better service. Respondents also indicated that shopping trips to the United States were frequently combined with social events and family activities. Also, the surveys showed that the pre-1982 purchasing power of the peso in the U.S. marketplace was an important reason Mexican nationals chose to shop in the United States.

The peso's buying power relative to the dollar is a function of the peso-dollar exchange rate and the differential in the two domestic rates of inflation. For example, if inflation in Mexico is higher than in the United States over time and the peso-dollar exchange rate is held constant, the peso price of similar goods and services will be lower in the United States.

From 1978 to 1982, Mexico experienced higher rates of inflation than did the United States, while concurrently maintaining a fixed exchange rate. Hence, the peso enjoyed a period of enhanced buying power in the U.S. market. Mexicans crossed the border in increasing numbers to trade with local U.S. retailers. To encourage their Mexican customers, U.S. merchants stepped up advertising campaigns in local Mexican newspapers and on the radio. Moreover, U.S. retailers began to accept pesos rather than requiring payment in dollars.<sup>11</sup>

### **Impact of Mexican demand on U.S. trade**

During 1978–80, U.S. border counties showed significant employment concentrations in general merchandising and apparel retailing and rapid employment growth in retail and nondurable wholesale industries. In Santa Cruz County, AZ, for example, these industries were four times as concentrated in the county than in the State as a whole (location quotients of 4.0). (See table 2.)

Apparel retailing showed a strong concentration in Webb County, TX (with a location quotient of 4.1). General merchandise retailing also had significant concentration with a ratio of 2.7. The city of Laredo, located in Webb County, was the recipient of \$1.5 billion spent by Mexican nationals in 1981 and had the third highest retail sales per resident of any city in the United States that year (\$22,000 per person).<sup>12</sup>

Border area employment in the retail and wholesale sectors grew rapidly over the study period. The significant county-share effect values in table 2 indicate that county-specific factors have strongly influenced trade industry growth in some of the border counties.

In Santa Cruz County, county-specific factors explain 47

**Table 2. Location quotients<sup>1</sup> and shift-share components<sup>2</sup> for selected border counties and trade industries**

County	Industry	Employment change				Location quotient
		Actual	Effect of shift-share by			
			Statewide	Industry mix	County share	
Santa Cruz (Arizona):	General merchandise . . . . .	187	89	9	88	4.4
	Food . . . . .	42	35	17	-11	1.4
	Apparel . . . . .	66	23	15	27	4.0
	Eat/drink . . . . .	46	39	7	1	0.8
	Wholesale (nondurable) . . . . .	94	67	-82	108	4.8
San Diego:	Eat/drink . . . . .	3,989	3,048	757	182	1.1
Cameron (Brownsville):	General merchandise . . . . .	280	253	-125	152	1.6
	Food . . . . .	335	209	87	38	1.2
	Eat/drink . . . . .	363	268	94	1	0.9
	Wholesale (durable) . . . . .	326	243	102	-20	0.9
El Paso:	General merchandise . . . . .	225	580	-286	-69	1.4
	Eat/drink . . . . .	308	869	305	-867	1.0
	Wholesale (durable) . . . . .	1,043	553	233	256	0.8
Hidalgo (McAllen):	General merchandise . . . . .	402	251	-124	274	1.4
	Food . . . . .	710	225	93	397	1.2
	Eat/drink . . . . .	493	246	86	159	0.7
	Wholesale (nondurable) . . . . .	523	379	-140	283	1.9
	Wholesale (durable) . . . . .	453	208	88	156	0.7
Webb (Laredo):	General merchandise . . . . .	211	219	-108	100	2.7
	Food . . . . .	121	119	49	-47	1.3
	Apparel . . . . .	470	141	21	307	4.1
	Eat/drink . . . . .	370	120	42	207	0.9
	Wholesale (nondurable) . . . . .	125	92	-34	66	1.1

<sup>1</sup>Location quotients indicate the extent of industrial specialization present in a region at a point in time and are computed from 1980 annual averages.

<sup>2</sup>Shift-share components isolate explanatory growth factors and are computed using 1978 as the base period and 1980 as the end period.

percent of the increase in employment in general merchandise retailing and also account for 41 percent of the net employment change in apparel retailing. In the nondurable wholesale industry, the county effect offsets a large negative industry mix effect. This may indicate that most of the industry's statewide growth has been concentrated in the border area.

Similar results were derived for other border counties. Particularly in Hidalgo County (McAllen, TX), where significant Mexican outshopper activity occurs, the county-share effect strongly influenced employment increases in general merchandising, food retailing, eating and drinking places, and wholesale outlets. The data suggest that the influx of Mexican consumers into the United States, caused by the increasing disposable income of Mexican workers and superior buying power of the peso in the United States, stimulated the expansion of retail and wholesale businesses on the U.S. side of the border.

Other research supports the existence of an emerging dependency between the Mexican and U.S. border economies.<sup>13</sup> Testimony at recent hearings of the House Committee on Government Operations cited the importance of the *Maquiladora* Program for the entire region. Data from the U.S. Department of Commerce were presented showing that borderland Mexican families made 40 to 75 percent of their expenditures in the United States, purchasing more

than \$4.8 billion of goods and services from border region businesses in 1981.<sup>14</sup>

### Mexican devaluations

Inflation in Mexico has historically been higher than that experienced in the United States. This, in addition to the Mexican Government's policy of supporting the peso to maintain long-term exchange-rate stability, has resulted in extended periods when the peso was overvalued in terms of the U.S. dollar. Consequently, Mexican exports, and the employment and income generated from their production, were probably lower than they would have been had more regular exchange-rate adjustments occurred. Conversely, Mexican imports have been less expensive, increasing demand for foreign-made products. Large periodic devaluations have brought the value of the peso back into line with the dollar, while the corresponding drop in the peso's buying power has shocked economies on both sides of the border.

In 1976, 22 years after the previous adjustment, the peso was devalued 45 percent in terms of the dollar. The unexpected magnitude of the 1976 devaluation caused immediate and severe shocks to border economies. Goods and services in the United States became prohibitively expensive for Mexican consumers. Mexican outshopper activity was drastically reduced. Some United States counties along the border were hit so severely that they qualified for Federal

economic disaster aid.<sup>15</sup>

The border areas remained depressed until the financial incentive returned for Mexican consumers to shop in the United States. This occurred because Mexico's annual average inflation rate of 30 percent remained higher than inflation in the United States, and the Mexican Government again supported a stable peso-dollar exchange rate. The value of the peso gradually increased in relation to the dollar, making U.S. goods and services relatively attractive again to Mexican consumers. The cycle of an overvalued peso, Government support to stabilize the currency, and eventual devaluation was again played out in February 1982 when the peso was devalued by 30 percent. The equivalent peso price of goods and services in the United States increased by 70 percent, causing a painful shock to border economies. For example, in February 1982, all but two areas along the Texas border lost retail sales in comparison with the previous year.

Although the February 1982 peso devaluation was substantial, it was insufficient to resolve Mexico's trade imbalance and did not allow Mexico to obtain enough foreign exchange to meet its obligations to creditors. Hence, 6 months later, while local economies were still reeling from the February devaluation, the peso was further devalued by 75 percent.<sup>16</sup> In addition, exchange controls were imposed. Dollar accounts in Mexican banks, amounting to about \$14 billion, could only be withdrawn in pesos at a devalued rate of 69.5 pesos to the dollar. Customers buying pesos with dollars were also charged this rate, while limited amounts of dollars for specific government-sanctioned purposes could be purchased at 49.5 pesos to the dollar. All other foreign exchange demands, including those of Mexicans wanting to shop in the United States, were subject to the higher market-determined rate. Five days after implementation of the new exchange rules the market-determined exchange rate was 90 pesos to the dollar.

### **Impact of devaluations on U.S. border economies**

Retail businesses in U.S. border towns suffered from the effects of the February and August 1982 peso devaluations. The damage was greatest in small towns where much of the employment is concentrated in retail trade. To a lesser extent, large cities with more diversified industrial mixes were affected.

Wholesale and retail trade employment showed immediate and sharp declines in the months following the devaluation. Trade employment in Brownsville, TX, in September 1982, was almost 6.5 percent below the level of a year earlier. In comparison, employment from September 1980 to 1981 in Brownsville showed a 10.7-percent increase. Other small, border cities such as Laredo and McAllen, TX, showed similar over-the-year downward trends. San Diego, being larger and more economically diverse, did not experience the same drastic effects as Brownsville, Laredo, or McAllen.<sup>17</sup>

Employment trends experienced by these two distinct types of border area economies differ. San Diego's employment has shown slow, steady growth during the past 4 years. Unemployment has moved in the same direction as the national business cycle, climbing in the summer of 1981 and peaking in late 1982. Laredo had a larger percentage increase in employment than did San Diego until the devaluation in February 1982. After the devaluation, Laredo's employment dropped sharply. The unemployment rate shot up rapidly and by early 1983 was more than two and a half times its January 1980 level.

Research published by the Dallas Federal Reserve Bank quantifies the relationship between industrial diversification and exchange-rate shocks for selected Texas border cities. Of the four cities studied (El Paso, Laredo, McAllen, and Brownsville), Laredo was most closely tied to the Mexican economy. Laredo, which has a large retail sector, also suffered the worst unemployment rate of any border city during 1982 and 1983. In comparison, El Paso, a city with a large manufacturing sector, was better able to withstand fluctuations in Mexican demand for U.S. goods and services. Its unemployment rate peaked at about 14 percent in 1983 compared with Laredo's 28 percent.<sup>18</sup>

The impact of exchange-rate adjustments on border county unemployment for San Diego, El Paso, Webb, Cameron, and Hidalgo Counties varies. Webb County, where the city of Laredo is located, was the most sensitive to peso devaluations, San Diego, the least. Webb County has a high concentration of retail and a relatively low concentration of manufacturing industries. The September 1982 unemployment rate for Webb County was 21.7 percent. In contrast, San Diego County has a more diversified industry mix. The unemployment rate there in September 1982 was 9.8 percent. Accordingly, correlation coefficients for county unemployment rates and the peso-dollar exchange rate are generally higher for counties which rely more on retail establishments for employment and less on manufacturing. The correlation coefficient for Webb is .82; Hidalgo, .80; and Cameron, .72. Conversely, San Diego and El Paso have correlation coefficients of .31 and .48.

### **Impact of devaluations on the Mexican side**

After the 1982 devaluations, merchants in Mexican border towns experienced an influx of bargain-hunting U.S. citizens entering Mexico to take advantage of the dollar's newly enhanced buying power. Gasoline sold there for the equivalent price of 33 cents per gallon.<sup>19</sup> Basic food items, such as sugar and flour whose prices were supported by the Mexican Government, were being bought up by U.S. citizens. Store inventories were rapidly being depleted, forcing the Mexican Government in August 1982 to restrict the transport of certain commodities into the United States.<sup>20</sup>

In spite of the devaluations, Mexican inflation continued to exceed inflation rates in the United States. Inflation in

Mexico was more than 100 percent per year by September 1982.<sup>21</sup> While Mexico stabilized the peso-dollar exchange rate at 70 to 1 for most purposes, including most dollar purchases of pesos, the peso's value for all other uses was allowed to float and consequently continued to fall in dollar terms. Peso purchases of dollars were based on the much higher floating rate.

The differential in exchange rates in the two countries had two important results. First, U.S. nationals traveling to Mexico exchanged their dollars for pesos in the States.<sup>22</sup> In so doing, they received 15 to 30 more pesos to the dollar than they would have had they waited until they were in Mexico. Second, U.S. retailers, in an attempt to regain their Mexican customers, offered discounts and extended payment schedules to peso customers. They also accepted pesos at an above-market rate, absorbing the exchange loss themselves when they deposited the pesos in their local banks.<sup>23</sup> Consequently, Mexico was capturing almost no dollars, while U.S. banks were being flooded with unwanted pesos. U.S. banks reacted by refusing to accept additional pesos.<sup>24</sup>

Mexico's inability to obtain sufficient dollars and the lack of peso-dollar convertibility made it very difficult for Mexican manufacturers to import components and raw materials from the United States. They either had to find domestic suppliers, who were likely to be located farther away than U.S. suppliers, increasing transportation costs and making delivery dates less predictable, or stop operations.<sup>25</sup> Because many of the U.S. suppliers were located along the border, employment in the region suffered.

The downturn in manufacturing employment is most vividly seen in El Paso. Using year-ago comparisons for September and October of 1981 and 1982, large percentage-increases in employment occurred in September (19.8 percent) and October (15.0 percent) of 1981 while over-the-year declines occurred for the same months in 1982 (-19.3 percent and -15.6 percent).<sup>26</sup> The resulting downturn in manufacturing on both sides of the border, coupled with the reduction in Mexican outshopper activity, led to a sharp increase in unemployment along the U.S. border.

At the official rate of 70 pesos to the dollar, Mexico was capturing only 12 percent of its dollar requirements by September 1982. Rapidly growing inflation was also a continuing problem, particularly in Mexican border communities. Faced with an intolerable situation, the Mexican Government revised its exchange rules in November 1982, allowing border area merchants and money changers to exchange pesos for dollars at rates similar to market-determined rates existing in the United States. A two-tiered exchange structure emerged in Mexico, with the Mexican border areas adopting a semiflexible rate, while the fixed 70 to 1 rate was adhered to in the Mexican interior. The new rules did result in additional dollars coming into Mexico. This allowed Mexican manufacturers to again purchase U.S. source components and raw materials, and allowed local merchants and consumers to acquire U.S. products.<sup>27</sup>

## The current situation

Several recent events should have an impact on the border area economy. In August 1984, the Mexican Government and its 550 foreign creditors concluded a rescheduling of payments on Mexico's public sector debt. This agreement averted the prospect of Mexico repaying \$10 billion in loans next year with the remainder of its \$48.7 billion debt falling due during 1985-90. The rescheduling will spread repayments through 1998. Other bank concessions on fees and interest rates will save Mexico \$5.5 billion. The rescheduling is contingent upon Mexico continuing to maintain policies of economic austerity.<sup>28</sup>

Clearly, any improvement in Mexican economic conditions will have a positive effect on U.S. border area employment. Gains in employment in Mexican border areas should allow Mexican consumers to purchase U.S. goods and services and increase demand for inputs into *maquiladora* manufacturing.

As of December 1984, the five counties profiled in this article had all started to show signs of recovery from their devaluation-induced economic problems. Four of the five areas showed increases in total nonagricultural employment and declines in unemployment from December 1983. The over-the-year change in unemployment for Laredo, TX, was the largest decline among all U.S. metropolitan areas. However, Laredo still had the Nation's second highest area unemployment rate in December 1984. McAllen had the Nation's highest unemployment rate in December and was the only border area to show an over-the-year increase in unemployment and a decline in employment.<sup>29</sup>

In addition to the debt restructuring and growth in employment, other factors have the potential to affect the border area. The value of the peso has not yet stabilized. Continuing shifts in the world price of oil make any attempt to establish a firm price for the peso very difficult. Severe winter weather during the past 2 years has had an adverse impact on agriculture on both sides of the border. Weather-related damage to the area's citrus groves may also disturb local tourism and trade. As indicated earlier, *Maquiladora* Program employment is related to the growth of U.S. manufacturing, particularly the apparel industry. The current strength of international competition in the industry could make growth difficult.

The turbulent events of 1976 and 1982 have demonstrated the importance of interregional dependencies on border communities. Although these relationships can be beneficial to both sides, they may also increase regional vulnerability to exchange-rate fluctuations. The evidence presented here suggests that more diversification in regional industry mix in border regions tends to moderate negative aspects inherent in their geographic location. Lessons learned from the 1982 peso devaluations should be of great value to those involved in formulating economic development strategies for border areas in the future. □

<sup>1</sup>*The World Almanac*, 1984 ed. (New York, Newspaper Enterprise Association, Inc.), p. 435.

<sup>2</sup>A cooperative endeavor of the Bureau of Labor Statistics and State employment security agencies, the Covered Employment and Wages Program is a comprehensive and accurate source of employment and wage information reported by industry at the national, State, and county level. Data coverage includes employment and wages for workers covered by State unemployment insurance laws and for civilian workers covered by unemployment for Federal employees.

To facilitate the analysis, employment data were reduced to manageable levels first by selecting only those counties with potentially significant cross-border economic activity (determined by the presence of neighboring towns or cities on opposite sides of the border with relatively large populations) and second by deleting from the data base all industries with less than 3 percent of total county level average monthly employment for 1980. The remaining industries and counties, because of their relative importance to regional economic well-being, were retained.

For a fuller explanation of the Covered Employment and Wages Program see the *BLS Handbook of Methods*, Vol. 1, Ch. 5, "Employment and Wages Covered by Unemployment Insurance."

<sup>3</sup>Anna-Stina Ericson, "An analysis of Mexico's border industrialization program," *Monthly Labor Review*, May 1970, pp. 33-40.

<sup>4</sup>Roger Turner, "Mexico Turns to its In-Bond Industry as a means of Generating Exchange" reprint from *Business America*, Nov. 28, 1983 (U.S. Department of Commerce, International Trade Administration), p. 2.

<sup>5</sup>Turner, "Mexico Turns to its In-Bond Industry," p. 2.

<sup>6</sup>Luis Suarez Villa, "La Utilizacion de factores en la industria Maquiladora de Mexico," *Comercio Exterior*, October 1982, p. 1132.

<sup>7</sup>Turner, "Mexico Turns to its In-Bond Industry," p. 2.

<sup>8</sup>Ibid.

<sup>9</sup>See Table 75, "Persons by Spanish Origin, Race, and Sex: 1980," *General Social and Economic Characteristics of the 1980 Census of Population, PC 80-1-C1, U.S. Summary* (U.S. Bureau of the Census, December 1983).

<sup>10</sup>Linda Chavez, "Mexico Curbs: Border Suffers," *The New York Times*, Sept. 25, 1982, p. 39.

<sup>11</sup>"In El Paso Stores, a Nervous Quiet," *The New York Times*, Sept. 25, 1982, p. 41.

<sup>12</sup>"Down and Out in Laredo," *Fortune Magazine*, Nov. 1, 1982, p. 139.

<sup>13</sup>Harry W. Ayer and Ross M. Layton, "The Border Industry Program and the Impacts of Expenditures by Mexican Border Industry Employees

on a U.S. Border Community: An Empirical Study of Nogales," *Annals of Regional Science*, June 1974.

<sup>14</sup>*The Federal Response to the Impact of Mexican Peso Devaluations on U.S. Border Business* (U.S. House of Representatives, Committee on Government Operations, 22d Report, 98th Cong., 1st sess.), Nov. 19, 1983, p. 21.

<sup>15</sup>Steve Frazier, "U.S. Towns Near the Border with Mexico Feel the Slump From Peso's Devaluation," *The Wall Street Journal*, Mar. 1, 1982, p. 25.

<sup>16</sup>Wayne King, "Peso's Turmoil Shakes Economies of Cities on Mexican-U.S. Border," *The Wall Street Journal*, Aug. 22, 1982, p. 1.

<sup>17</sup>These data are based on a monthly survey of establishment payroll records conducted by the Bureau of Labor Statistics, in cooperation with State agencies. The survey is designed to provide industry information on nonagricultural wage and salary employment, average weekly hours, average hourly earnings, and average weekly earnings for the Nation, States, and metropolitan areas. The data are derived from a sample of more than 200,000 establishments employing more than 35 million nonagricultural wage and salary workers and relate to all workers full- or part-time who received pay during the payroll period which includes the 12th day of the month.

<sup>18</sup>Alberto E. Davila, Ronald H. Schmidt, Gary M. Ziegler, "Industrial Diversification, Exchange Rate Shocks, and the Texas-Mexico Border," *Economic Review* (Federal Reserve Bank of Dallas, May 1984), p. 6.

<sup>19</sup>King, "Peso's Turmoil," p. 1.

<sup>20</sup>William E. Schmidt, "Southwest is Cashing in on the Peso from Wealthy Visitors from Mexico," *The New York Times*, Feb. 10, 1982, p. 14.

<sup>21</sup>*International Financial Statistics*, International Monetary Fund, May 1984.

<sup>22</sup>"In El Paso Stores," *The New York Times*, p. 41.

<sup>23</sup>Chavez, "Mexico Curbs," p. 39.

<sup>24</sup>Robert Reinhold, "New Rules on Peso Lure Some Dollars," *The New York Times*, Nov. 26, 1982, p. D5.

<sup>25</sup>Chavez, "Mexico Curbs," p. 3.

<sup>26</sup>Establishment Survey data (see footnote 17).

<sup>27</sup>Reinhold, "New Rules on Peso," p. D5.

<sup>28</sup>"Tequila with Salt," *The Economist*, Sept. 15, 1984, p. 85-86.

<sup>29</sup>Bureau of Labor Statistics, "State and Metropolitan Area Employment and Unemployment: December 1984," Press Release, Feb. 12, 1985.

## APPENDIX: Analytical techniques and limitations

Location quotients indicate the extent of industrial specialization present in a region at a point in time. In this study, the ratio of industry to total employment in the county is compared to the ratio of industry to total employment in the State. Location quotients (LQ) can be expressed as

$$\frac{E_{ic}/E_c}{E_{is}/E_s} = LQ$$

where:  $E_{ic}$  = Industry employment in county

$E_c$  = Total employment in county

$E_{is}$  = Industry employment in State

$E_s$  = Total employment in State

Values greater than 1 indicate relatively higher concentrations of the industry's employment, and, therefore, proportionally more of the industry's activity, in the county compared with the State.

Shift-share components attempt to isolate explanatory growth factors. Theoretically, industry employment changes can be separated into three categories: the statewide, industry mix, and county share effects. The statewide effect reflects the impact of growth in State total employment upon the industry's employment in the county. Algebraically, the statewide growth effect,  $N$ , is

$$N = [E_{ic}(t-1) \times E_s(t)/E_s(t-1)] - E_{ic}(t-1)$$

where:  $E_{ic}$  = Industry employment in county

$E_c$  = Total employment in county

$E_{is}$  = Industry employment in State

$E_s$  = Total employment in State

$t$  = End period

$t-1$  = Base period

The industry mix effect measures the impact on county level industry employment resulting from the distribution of the

county's total employment among higher and lower growth industries. Using the previous notation, industry mix,  $M$ , is:

$$M = \frac{[Eic(t-1) \times (Eis(t)/Eis(t-1) - Es(t)/Es(t-1))] - Eic(t-1)}{Eic(t-1)}$$

The county share effect measures that part of local employment growth resulting from unique competitive advantages present in the local area for that industry. This last component is important because it partly measures the influence of Mexican consumers and manufacturers on U.S. border areas. Using the same notation as before, the county share effect,  $S$ , is:

$$S = \frac{[Eic(t-1) \times (Eic(t)/Eic(t-1) - Eis(t)/Eis(t-1))] - Eic(t-1)}{Eic(t-1)}$$

The sum of these three factors represents the actual growth,  $R$ , of the industry in the county where:

$$R = N + M + S \text{ and} \\ R = Eic(t) - Eic(t-1)$$

Viewed together these growth factors can illuminate, at least in general terms, the reasons for an industry's local area performance.

Using changes in employment as a proxy for changes in industrial activity introduces problems of which the reader should be aware. Employment growth, for example, may systematically understate economic activity when the industry is experiencing rapid labor productivity gains. Furthermore, under-employment and part-time employment are not explicitly accounted for in equations for location quotients and shift-share components. Hence, an increase in part-time employment may exaggerate business activity. Nevertheless, these analytical techniques can be useful descriptive tools in exposing shifts in industrial composition and the forces responsible for change.

### **An early call for participative management**

Shortly before he left office in 1920, [BLS Commissioner Royal] Meeker warned of the growing bitterness in labor-management relations, lamenting the inability to carry over the cooperative relationships of the war years into peacetime. He cited the British experience of securing worker representation on joint industrial councils and works committees. At home, he saw the resumption of employer opposition to unions and little prospect for continuing such wartime efforts as worker representation on shop committees. "We are today exactly where the British were about 30 years ago," he stated. Meeker's conclusion was more an appeal: "Before abandoning ourselves completely to pessimism and despair, we should at least try the experiment of giving the workers a real voice and responsibility in management."

—JOSEPH P. GOLDBERG AND WILLIAM T. MOYE  
*The First Hundred Years of the  
Bureau of Labor Statistics,  
Bulletin 2235 (Bureau of Labor  
Statistics, 1985).*