



Using Personal Income and Retail Sales Data to Estimate Exported Retail Sales along the Texas–Mexico Border

Cross-Border Shopping Activity Conference
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Roberto Coronado
Federal Reserve Bank of Dallas
El Paso Branch

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Introduction–Why is this important?

- Over the past 10 years, trade between the U.S. and Mexico has boomed, partly due to the significant reduction in tariffs from NAFTA and the strong growth in the maquiladora industry.
- Along with the expansion in trade, there has been a strong growth in the population along the northern border of Mexico.
- While commercial trade between the U.S. and Mexico is well documented, less is known about the size of the cross-border retail trade that exists.



Introduction–Why is this important?

- Though the size of this activity is small in comparison to commercial trade, it is a significant part of many border city economies.
- In 2003 alone there were more than 38 million non-commercial crossings at the bridges along the Texas–Mexico border.
- Many of these individuals were coming to purchase goods to take back to their home country.



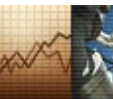
Basic Model

- Phillips and Manzanares suggest a simple short-run consumption function:

$$C = f(Y)$$

where it is assumed that individuals spend a fixed proportion of their income on consumption, on this case, retail sales.

- They find that from 1986-1998 retail sales as a fraction of personal income in Texas averaged 46 percent.



Consumption Model

- While the simple consumption model based on income produce reasonable results, we make further refinements to the model by separating personal income into three components
- The border is a region with a low employment to population ratio due to its young labor force and high unemployment rates.
- It also has persistently low per capita personal income yet strong rates of job growth



Consumption Model—Expanded

- We divide personal income in the following manner:

$$Y = (Y/POP)*(POP/EMP)*EMP,$$

where POP is population and thus Y/POP is per capita income, POP/EMP is the inverse of the employment to population ratio and EMP is total employment.

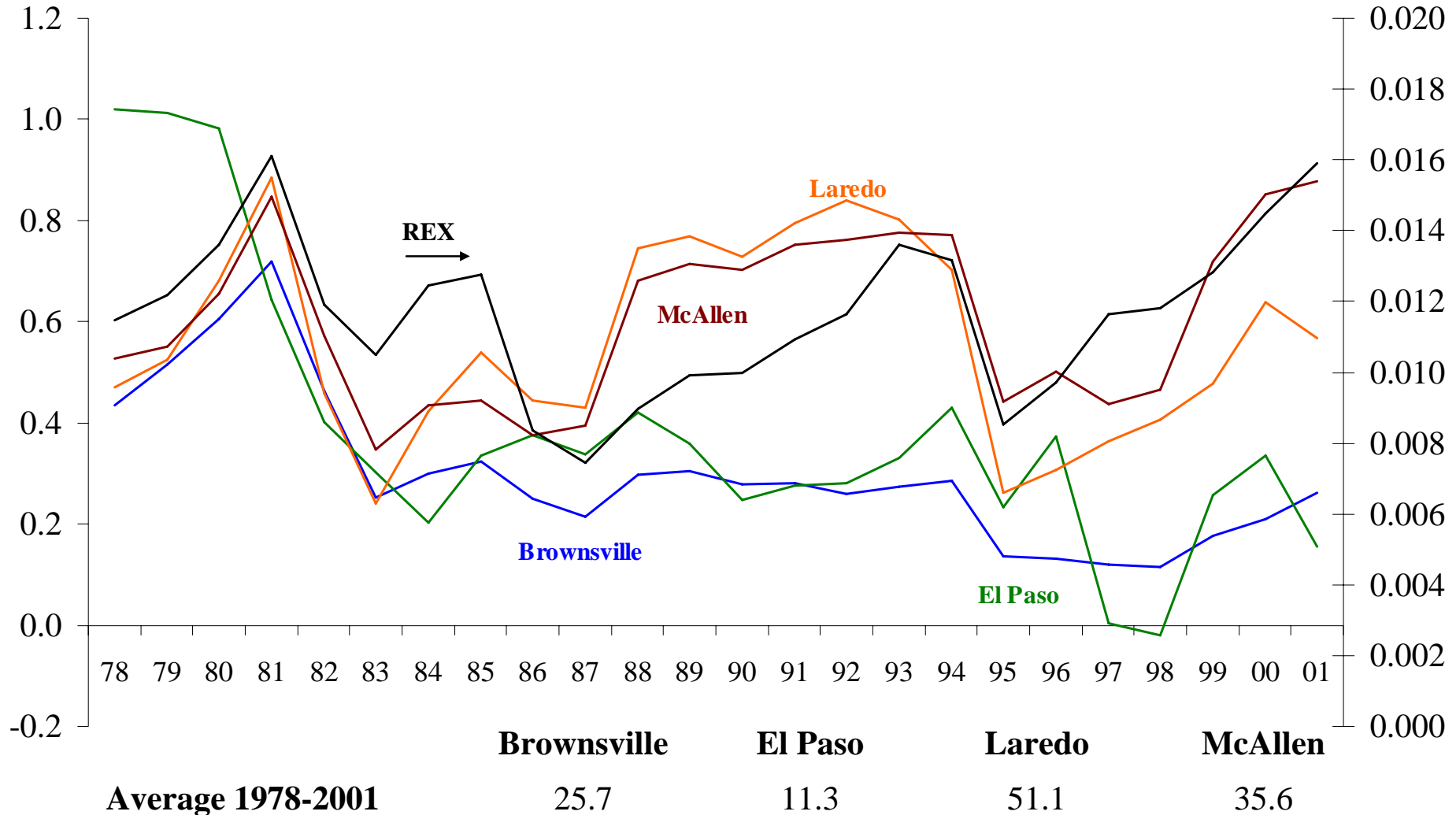
- We estimate the model with annual data from 1978 to 2001 for 23 non-border MSAs in Texas.



Exported Retail Sales Very Sensitive to Peso Movements

Net Exported RS, Real, Billions

Real Exchange Rate



Sizing up Exportable Retail Sales

| | Border Net Exported Retail Sales (Millions) | Share of Texas Border Retail Sales | Share of Texas Retail Sales |
|-------------------|--|---|--|
| 1978 | 1,599.4 | 41.3 | 1.6 |
| 1980 | 2,408.0 | 44.7 | 2.3 |
| 1981 | 2,813.4 | 43.9 | 2.6 |
| 1982 | 1,828.9 | 32.3 | 1.8 |
| 1990 | 2,557.9 | 27.2 | 2.4 |
| 1994 | 3,243.7 | 26.0 | 2.6 |
| 1995 | 1,636.3 | 14.5 | 1.2 |
| 2000 | 3,507.2 | 21.4 | 2.0 |
| 2001 | 3,299.1 | 19.4 | 1.9 |
| Avg. 78-01 | 2,263.2 | 26.4 | 1.9 |

Source: Texas Comptroller Accounts and author's calculations

What do border cities export?

EL PASO

| | | |
|----|---|------|
| 1 | 4521 Department stores (excl leased depts) | 2.07 |
| 2 | 4482 Shoe stores | 2.04 |
| 3 | 4413 Automotive parts, accessories, & tire stores | 1.57 |
| 4 | 4481 Clothing stores | 1.46 |
| 5 | 4483 Jewelry, luggage, & leather goods stores | 1.36 |
| 6 | 4421 Furniture stores | 1.27 |
| 7 | 4529 Other general merchandise stores | 1.24 |
| 8 | 4441 Building material & supplies dealers | 1.20 |
| 9 | 4451 Grocery stores | 1.18 |
| 10 | 4533 Used merchandise stores | 1.18 |

MCALLEN

| | | |
|----|---|------|
| 1 | 4533 Used merchandise stores | 5.00 |
| 2 | 4529 Other general merchandise stores | 2.90 |
| 3 | 4453 Beer, wine, & liquor stores | 2.19 |
| 4 | 4481 Clothing stores | 2.16 |
| 5 | 4482 Shoe stores | 2.13 |
| 6 | 4452 Specialty food stores | 1.96 |
| 7 | 4521 Department stores (excl leased depts) | 1.89 |
| 8 | 4442 Lawn & garden equipment & supplies stores | 1.84 |
| 9 | 4413 Automotive parts, accessories, & tire stores | 1.74 |
| 10 | 4451 Grocery stores | 1.72 |

LAREDO

| | | |
|----|---|------|
| 1 | 4483 Jewelry, luggage, & leather goods stores | 4.44 |
| 2 | 4481 Clothing stores | 3.82 |
| 3 | 4533 Used merchandise stores | 2.99 |
| 4 | 4413 Automotive parts, accessories, & tire stores | 2.58 |
| 5 | 4452 Specialty food stores | 2.17 |
| 6 | 4511 Sporting goods, hobby, & musical instrument stores | 2.05 |
| 7 | 4451 Grocery stores | 1.99 |
| 8 | 4441 Building material & supplies dealers | 1.17 |
| 9 | 4421 Furniture stores | 0.89 |
| 10 | 4422 Home furnishings stores | 0.82 |

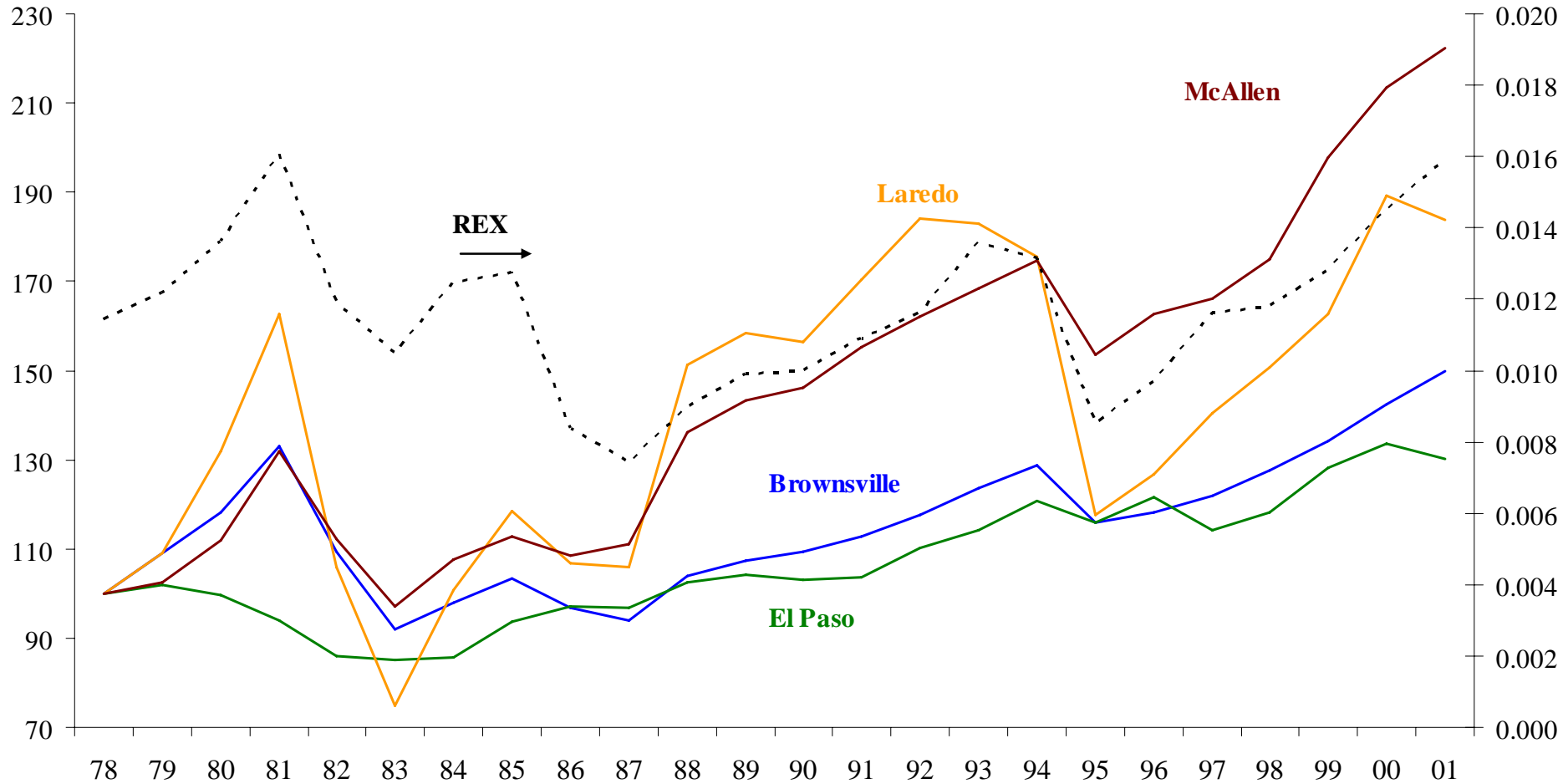
BROWNSVILLE

| | | |
|----|---|------|
| 1 | 4529 Other general merchandise stores | 2.10 |
| 2 | 4483 Jewelry, luggage, & leather goods stores | 2.08 |
| 3 | 4413 Automotive parts, accessories, & tire stores | 1.83 |
| 4 | 4451 Grocery stores | 1.81 |
| 5 | 4481 Clothing stores | 1.38 |
| 6 | 4421 Furniture stores | 1.21 |
| 7 | 4412 Other motor vehicle dealers | 1.20 |
| 8 | 4441 Building material & supplies dealers | 1.16 |
| 9 | 4532 Office supplies, stationery, & gift stores | 1.01 |
| 10 | 4511 Sporting goods, hobby, & musical instrument stores | 0.84 |

Exchange rate has largest impact on MSA's with highest Retail Export Shares

Total Retail Sales
Real Index, 1978 = 100

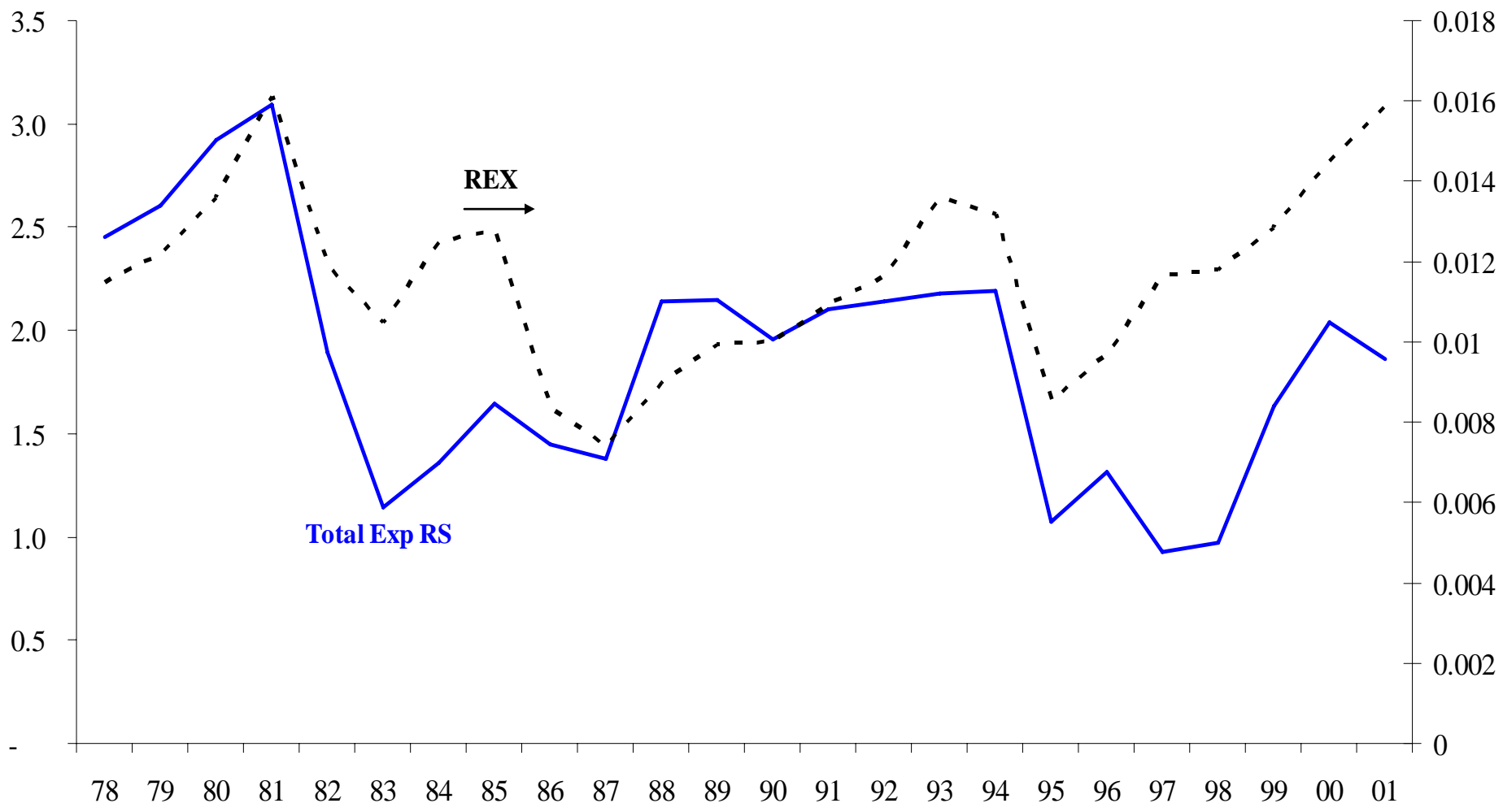
Real Exchange Rate



Do devaluations have a permanent impact?

Total Exportable Retail Sales
Billions, Inflation Adjusted

Real Exchange Rate

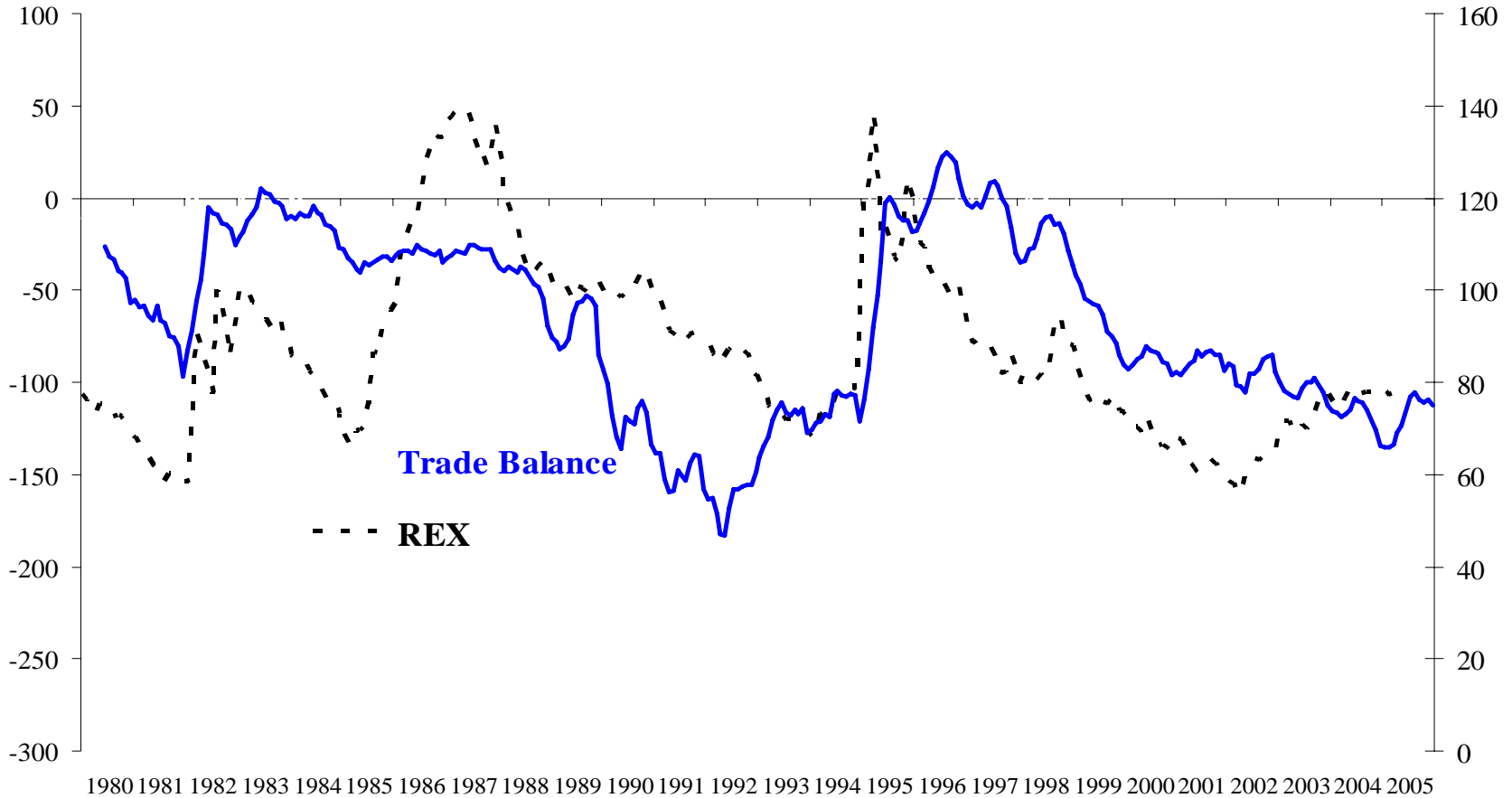


Overall Cross-Border Retail Trade Activity

Mexico's Trade Balance by Border Commuters

6-mo. Moving Average
Balance in 000,000s of Dollars

REX, Index, 1990=100



Source: Banco de Mexico



Retail Sales Responsiveness to REX

- We perform Granger Causality Tests on the sensitivity of overall retail sales to swings in the value of the peso.
- Results show that in all border MSAs but El Paso, changes in the real exchange rate granger-cause movements in total local retail sales.
- We also developed impulse response functions from the two-variable VAR (REX & RS).

Concluding Remarks

- We use a simple consumption function to estimate retail sales in the four MSAs along the Texas–Mexico border for the years 1978 – 2001
- The model fits well in a pooled regression run across 23 MSAs in the state.
- As a check on our results we analyze the responses of retail sales to changes in the real value of the peso.



Concluding Remarks

- The results on the sensitivity of retail sales to a shock in the value of the peso were consistent with our results we derived from the consumption function estimation: MSAs that we estimated had the largest share of exported retail sales also had the largest response to shocks to the real value of the peso.

