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Abstract

This paper studies the exchange rates at which Mexican pesos are accepted for retail purchases in El Paso, Texas. A stratified random sample of 586 participating firms is surveyed to examine two aspects of reverse dollarization in the El Paso/Ciudad Juárez border region. The first is to determine the percentage of retail businesses in El Paso that accept foreign currency in the form of Mexican pesos. The results suggest that just over 13.1% (77/586) of all retail firms in this market accept pesos, which on average, comprise 4.35% of total sales for those firms. The second is to calculate the effective exchange rate at which firms accept Mexican pesos. We find that 68.5% of firms accepting the peso do so at a premium. We discern these two aspects further utilizing various multivariate analyses.

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1. Introduction

The flow of cross-border shopping is ubiquitous along America's northern and southern borders. Daily, tens of thousands of shoppers cross the border, from such places as Windsor, Ontario (Canada), San Diego, California (US) and Nuevo Laredo, Tamaulipas (Mexico), to purchase goods and services. The flow of shoppers is more pronounced coming into the US than that leaving the US for either Canada or Mexico (Pisani & Yoskowitz, 2006). Given this very large cross-border shopping flow, many border retail business establishments cater to "foreign" shoppers by accepting foreign currency as a substitute for the domestic currency as a matter of differentiated customer service and good business practice (Pisani, Yoskowitz, & Brusa, 2008).

As part of routine business operations, numerous border retailers not only accept foreign currency for purchases, but also do so wittingly in a dynamic foreign exchange environment. This market dynamism permits a discount or premium to be earned by retailers on currency movements (i.e., transactions). Doing so may increase sales volumes and/or improve profit margins. Currency substitution— the use of an alternate currency form as a replacement for the local currency— of this nature occurs in many countries (Selcuk, 2002). When the replacement currency is the US dollar, this phenomenon is more

commonly studied (Berg & Borensztein, 2000). But reverse dollarization within the United Sates, which also occurs, has received scant attention (Pisani & Yoskowitz, 2006; Yoskowitz & Pisani, 2007).

In this paper, we focus on a single border locale, El Paso, Texas, and a uni-directional flow of shoppers from Mexico regarding currency substitution. Ghaddar and Brown (2005) provide a useful profile of the Mexican cross-border shopper entering Texas. Nearly all come by private automobile (75%) or by walking across (20-25%) an international bridge. In 2008, 5.34 million pedestrians and 6.97 million automobiles traveled north from Ciudad Juárez to El Paso. Of this movement, two-thirds come for shopping (Ghaddar & Brown, 2005) where individuals arriving by car spend, on average, $182 per trip. Cross-border pedestrian consumers spend, on average, about $20 per trip (Ghaddar & Brown, 2005). Hence, the cross-border retail market in El Paso surpasses $1.1 billion dollars annually.

2. Prior Studies

Currency substitution is observed in many parts of the world. Handa and Bana (1990) argue that only when the absolute values of the yields on these payments exceed the transaction costs of handling foreign currency is there an enticement to switch between currencies. Uribe (1995) further observes that when transaction costs are higher for a foreign currency than a domestic currency, de-dollarization will come into play. In other words, transaction costs are important determinants of currency substitution. Inflation and information asymmetries about foreign currencies can also influence business decisions in this regard. In both cases, exchange rate and transaction cost uncertainty result, complicating the pricing decisions faced by managers.

For cross-border retail trade, exchange rates play a prominent role in influencing consumer flows (Patrick & Renforth, 1996). De Leon, Fullerton, and Kelley (2009) document a significant relationship between peso to dollar exchange rate fluctuations and international border crossings between Ciudad Juárez, Mexico and El Paso, Texas. Business managers are aware of this relationship and adjust prices in response to currency market developments (Fullerton & Coronado, 2001; Blanco Gonzalez & Fullerton, 2006).

Border regions face an interesting array of economic variables. In El Paso, approximately 11 percent of all retail sales are to consumers from Mexico (Coronado & Phillips, 2007). Not surprisingly, fluctuations in the currency value of the peso are correlated with changes in traffic flows across the international bridges linking El Paso to Ciudad Juarez (Fullerton, 2001; De Leon, Fullerton, and Kelley, 2009). Partial dollarization of the Mexican economy allows consumers to make purchases without using pesos in Ciudad Juárez (Pisani, Yoskowitz, and Brusa, 2008). To a lesser extent, reverse dollarization currency substitution also allows consumers to buy retail goods in El Paso without using dollars (Fullerton, Molina, and Pisani, 2009).

Both dollarization and reverse dollarization occur within the retail segments of the border areas between the United States and Mexico and the United States and Canada (Pisani, Yoskowitz, & Brusa, 2008). In El Paso, reverse dollarization occurs regularly, albeit not as extensively as dollar based currency substitution across the border in neighboring Ciudad Juárez. It is important to note that cross-border shopping is a major element that triggers currency substitution. A key feature that foments cross-border shopping is lower effective prices; variety and quality of goods differences also give rise to customer sojourns across international boundaries (Ghaddar & Brown, 2005; Yoskowitz & Pisani, 2002).

When cross-border shopping occurs in United States - Mexico border areas, firms in the retail sector may cater to Mexican customers by accepting pesos as a means of payment. Firms may accept the pesos at discount rates, breakeven rates, or at premium rates relative to the currency market. Firms that accept US dollars also face the same decisions. Mexican retail firms often accept US dollars at a discount (Pisani, Yoskowitz, & Brusa, 2008). Because the peso is a soft currency that is not always accepted in international transactions, it might seem logical for businesses to charge a premium in return for acceptance, but little empirical evidence has been documented in this regard.

Reverse dollarization tends to be more prevalent among firms located near the Canadian border zone than ones near the Mexican border. Prior studies indicate that approximately 20 percent of retail and restaurant firms along the southern border accept pesos, while 70 percent of businesses farther north accept regularly Canadian

dollars (Yoskowitz & Pisani, 2002; Pisani & Yoskowitz, 2006). Greater historic monetary instability in Mexico contributes to that difference. Nevertheless, cultural ties, language, proximity to a port of entry, and business relationships with the bordering country may reduce uncertainties of accepting foreign currency payments (Yoskowitz & Pisani, 2007; Fullerton, Molina, & Pisani, 2009). However, they can also make some retailers more risk averse and cause them to shy away from accepting payments in foreign currency. An example would be retailers that held pesos during turbulent periods of unexpected currency weakness such as September 1976 or December 1994. From a microeconomic perspective, awareness of the profit enhancing opportunity of maintaining a premium on exchange helps offset the costs of engaging in a dual currency sales operations (Pisani & Yoskowitz, 2006).

Although pesos can be utilized in El Paso, there is relatively little documentation of this phenomenon (Yoskowitz & Pisani, 2002). As a case of reverse dollarization along the southern border of the United States, it is something that merits attention since a soft currency is making at least limited inroads into a hard currency market. Because El Paso is one of the largest metropolitan economies adjacent to Mexico, the patterns observed in this market may be instructive for what occurs, or may eventually transpire, elsewhere. Retail sector payment substitution is the primary focus of this study.

3. Methodology

During the Summer and Fall of 2008, a survey was administered and completed by 586 participating retail firms in El Paso County, Texas. The universe of firms (n=2,860) began with a stratified random sample of ten market segments identified as retail centers with a high level of cash-based transactions by Yoskowitz and Pisani (2002). A desired total respondent count of 600 for statistical purposes was sought with proportional representation based upon market size and category minimums (n=30/10% of market segment) from the ten retail segments. The ten market segments include: bakeries and tortillerías, beer and liquor stores, beauty salons, convenience stores/gasoline stations, restaurants, grocery stores, pharmacies, retail clothing, hotel/motel, and general merchandise/discount merchandise. Also included in the sample is an assortment of local, regional, national, and international firms.

To obtain our final sample, 1,155 firms were targeted and contacted culminating in a 50.7% response rate. In order to increase the likelihood of firm participation, five paid and trained bilingual survey takers (all M.S. Economics students in the UTEP College of Business Administration) went to each retail establishment in person to administer the survey. Time to complete the survey ranged from 20 minutes to an hour with the owner, manager or business spokesperson identified to answer the survey. This method was chosen to reduce non-response, uninformed, and self-selection biases (Graeff 2002; Hudson et al., 2004).

The survey instrument utilized was replicated and extended from that used by Pisani, Yoskowitz, and Brusa (2008) and modified to reflect the El Paso business environment. The instrument consists of two parts. Part one covered twelve firm level demographic questions such as number of years the firm has been in the community, number of employees, proportion of employees who speak Spanish, distance from the nearest border crossing, and hours of operation among others. Part two concerned the decision to conduct business in pesos. Twenty two follow up questions are asked if the firm accepts pesos and eleven are asked if the business does not. The follow-up questions are designed to yield information concerning a firm's decision to accept or reject pesos. The average peso-dollar exchange rate for the survey period was 11.63 pesos per dollar with a standard deviation of 1.43. The survey questionnaire was available in both English and Spanish and followed standard translation procedures to ensure clarity and accuracy (Brislin, 1980).

4. Results

We present our results in four sections. The first describes the sample generally. The second explores the general rate of acceptance (or not) of the peso in the El Paso retail landscape. The third discerns the effective rate of exchange for that subset of firms who do engage in the acceptance of the peso in general business operations. We end with a discussion of our results.

Descriptive Statistics:

Within the sample as a whole and by design, our respondents ranged from very small mom and pop operations with no paid employees to large big box

operations with 600 employees (see Table 1). Two-thirds of all retail establishments employed ten people or less. On average, retail firms had been in operation for nearly 15 years with one firm charting a history of over 200 years in El Paso. As El Paso sits on the border with Mexico, it is no surprise that the mean distance to the nearest international bridge is just six miles. Many firms are in walking distance of Mexico, others required some form of transport (car or bus). El Paso is situated literally "on the path" or crossroads between the interior of central Mexico and the Western United States (or Rocky Mountains). As such, a bilingual retail workforce is a necessity reflected in our sample where 88.6% of retail employees speak Spanish. Our sample also reveals business operations located primarily on the U.S. side of the border with only five percent of firms possessing cross-border retail operations. This is partly a function of political stability, personal safety, flows of cross-border shopping movement northward, and the large size of the El Paso marketplace. Lastly, most El Paso retailers in our sample are open daily throughout most of the day. In sum, typical El Paso retailers surveyed are small businesses, open seven days per week, staffed with bilingual employees, located near the border with Mexico, without Mexican operations.

General Rate of Peso Acceptance:

Of the 586 firms in El Paso, Texas that participated in our survey, 77 or 13.1% of firms accept pesos for daily business transactions and 509 do not (see Table 2). The market segment with the greatest peso acceptance rate is grocery stores with 28.0% followed by retail clothing with 26.4%. The market segment with the lowest acceptance rate is pharmacies with none accepting pesos (0.0%). Local and international firms were much more open to accepting pesos in retail sales, 18.8% and 8.6%, respectively. Only 2.0% of regional and national firms in aggregate engage the peso in retail operations. We next explore the underpinnings of the acceptance decision.

The Effective Exchange Rate for Peso Acceptance:

In this section, we explore the effective rate of exchange for firms accepting pesos in the course of every day retail operations (n=77). Our focus surrounds those firms who accept pesos either at a premium or discount (no firm in our sample accepted the peso at a straight breakeven point). Fifty businesses (65.8%) among the accepting firms did so at a premium (i.e., profit) and 23

(31.5%) firms accepted the peso at a discount (i.e., loss). Four firms did not provide exchange rate data. Table 3 illustrates this breakdown by market segment (we drop pharmacies from our table as no firms in this market segment accepted pesos).

The effective exchange rate premia for each El Paso retail sector are also shown in Table 3. The premia are calculated by subtracting the market exchange rates listed on the Banco de Mexico website (www.banxico.org.mx) for the day when each business was surveyed from the individual business exchange rates. The business exchange rate is the de facto exchange rate at which retail businesses accept pesos as means of payment. When there is a premium charged, the retail business exchange rate is greater than the market exchange rate. When the business exchange rate is less than the current market exchange rate, a discount is given to the customer by that firm. The average premium required is approximately 1.00 pesos and the highest premia for converting pesos tend to be charged at gasoline stations and convenience stores. The average discount offered is approximately 0.33 pesos with the steepest discounts generally provided by hotels and motels.

Logistic Regression

To better understand firm decisions regarding peso acceptance for daily business transactions at premium or discount exchange rates, a logistic regression model is utilized. Logit models are estimated due to the binary or dichotomous nature of the dependent variable (PREMIUM) for accepting pesos at a premium or at a discount. Because the logit model is based on the cumulative logistic probability function, it constrains generated predictions to fall between 0 and 1 (premium = 1; discount = 0) for all explanatory variable values. Furthermore, the logit model transforms the probabilities of an event's occurrence into odds that fall within the range of the true regression line (Pindyck and Rubinfeld, 1998). Subsequent to the logit analysis, least squares regression analysis is employed to directly model the exchange rates charged by businesses that accept pesos. Variable definitions and mnemonics are listed in the Appendix.

As the logit model parameters are estimated through maximum likelihood estimation, some qualitative variable categories and dichotomous variables that

contain few observations are dropped or compacted prior to estimation. This step is taken to avoid quasi-complete or complete separation of values (Webb, Jeffrey, & Chong, 2004). The estimated explanatory variable coefficients for the subsequent logit models are interpreted based on the percentage changes in the odds for each one unit increase for the kth independent variable of interest (Demaris, 1992). The calculation for the percentage change in the odds due to a changte in an independent variable is $100*[\exp(\beta k)-1]$, where βk represents the estimated coefficient for the kth predictor. This approach is similar to that utilized in Pisani, Yoskowitz, and Brusa (2008).

The estimation results for our logit model are displayed in Table 4. The dependent binary variable is whether a firm charges a premium for peso conversion. The predictor variables include firm type, retail segment, source to determine exchange rate, perception of accepting pesos enhances sales, store sales (per week), perception that self-reported exchange rate results in a premium, and peso disposal method.

The results indicate that the variables associated with premium exchange rates are grocery retailers, firms that believe accepting pesos improves sales, retailers with sales below $25,000 per week or whose managers did not know their firm sales volumes, and retailers who hold on to the pesos accepted. Discount exchange rates, on the other hand, are associated with locally based firms, the retail segments of bakeries and tortillerías, clothing stores, convenience stores and gasoline stations, and firms that set the peso exchange rate through the rate reported by the newspaper or by central office. Specifically, we find that firms that set their exchange rate through newspaper reports or through the central office are 77 percent and 99 percent less likely to charge a premium, respectively. This is also the case for local firms which are close to 100 percent less likely to require a premium in the process of accepting pesos for retail transactions.

Four out of the ten coefficients estimated for the various retail business categories, BAKERY, CLOTH, GAS, and GROC, are significant at the 10-percent level (See Table 4). Firms in the bakeries and tortillerias (BAKERY) retail sector are 97% less likely to require a premium for accepting pesos. Businesses in convenience stores/gasoline stations (GAS) and retail clothing (CLOTH) retail segments are, respectively, 97% and 85% less

likely to charge a premium conversion rate. However, the firms within the grocery stores category (GROC) are nearly 12 times more likely to assess a premium on peso transactions. The results suggest that businesses in the bakeries and tortillerías, clothing stores, and convenience stores/gasoline stations firm categories lose on currency substitution transactions either purposefully to increase sales or accidentally by not updating currency conversion rates on a daily basis. The high odds value for grocery stores implies that they are able to increase profits by charging premiums on pesos received as means of payment and are cognizant of the currency market environment.

As expected, those firms who perceive that they charge a premium for accepting the peso are 12 times more likely to charge a premium exchange rate. Size by retail sales also has an impact. Those firms with the smallest levels of weekly sales were more likely to charge a premium in the currency transaction for retail goods. The smallest firms by sales, those with weekly sales under $5,000 and those firms with weekly sales between $5,001 and $25,000, they are 122 times and 62 times more likely to charge a premium, respectively. For those firms who did not report weekly sales, they too were much more likely 124 times to charge a premium leading us to believe that this subset is perhaps composed by small firms, too.

Overall, the model exhibits respectable values for goodness of fit measures. The reported McFadden R-squared is .4405 and the Hosmer-Lemeshow test result favorably accepts the null hypothesis that the model's predicted values are similar to the actual ones. The model accuracy rate for predicting discount exchange rates is 82.6% while it is 90.0% for premium exchange rate firms. As a whole, the model is 1.542 times better than chance (0.8767/0.5684) at predicting correctly and improves predictive accuracy by 19.2 percentage points compared to the intercept only model (Hair, et al., 1998).

Least Squares Regression

Least squares regression is used to model the business exchange rates offered at the peso accepting firms, since the latter involves a continuous left-hand side variable. Results for Least Squares Model appear in Table 5. That equation directly models the peso conversion premia and discounts measured in pesos. Its dependent variable is

PREMI (calculated by subtracting the market exchange rate from that rate stated by the firm, both from the day of the survey). Independent variables include perception that self-reported exchange rate results in a premium, percentage of sales conducted in pesos, perception that accepting pesos enhances sales, peso disposal method, how disposal method was selected, conversion time, and retail segment. The t-statistics in the regression output show that almost all of the explanatory variable coefficients are significant at the 10-percent level or better.

Estimation output for Least Squares Model indicates that every 1% increase in sales made using pesos (PESOSALE) will lead to a 3.63 peso decline in its conversion rate. In addition, firms that report exchange rates above the currency market rate (ABOVE) will charge 0.67 pesos, approximately, for every dollar spent in the currency substitution transaction. Businesses that convert their pesos between the third and fourth day (B3TO4DAY), and dispose of their pesos by other means than the ones specifically listed in the survey instrument (OTHERDISP), will lose approximately 0.56 and 0.62 pesos for every dollar spent, respectively. Firms that fall under the beauty salons retail category will charge a premium of 0.53 pesos per dollar and the ones that fall under the hotel/motel retail sector will accept pesos at a loss of 0.76 pesos per dollar spent.

The independent variable PESOSALE behaves similar to what is documented in earlier studies investigating currency substitution (Pisani, Yoskowitz, & Brusa, 2008). The coefficient for this variable suggests firms accept pesos at a discount to increase sales. Interestingly, when firms believe accepting pesos can enhance sales (HELP), they charge a premium of approximately 0.48 pesos per dollar spent on the transaction. Apparently, businesses that take three to four days to convert their pesos and dispose of their pesos by other means than the ones listed in the survey instrument end up losing money. It is possible that these businesses may gain more from converting pesos in less conventional ways and taking three to four days to do so than what they lose on accepting them. It is also possible that the elements that trigger this condition are that these firms fail to update conversion rates on a constant basis or do not employ a buffer premium exchange rate to handle the effects of currency market fluctuations.

General diagnostics for the Least Squares Model are encouraging. The F-statistic surpasses the 1-percent significance level. Adjusted for degrees of freedom, the coefficient of determination is 0.484, which is relatively high for cross-sectional data sets. Among the forecasting diagnostic measures, the in-sample U-Statistics suggest that most of any simulation error is a consequence of random disturbances. Moreover, the Theil Inequality Coefficient has a relatively low numerical value of 0.316. The Least Squares Model seems to provide an empirically sound complementary perspective for understanding the retail conditions under which reverse dollarization currency substitution occurs in this market.

6. Discussion & Conclusion

Two aspects of reverse dollarization are investigated in this paper. The first is the percentage of retail businesses in El Paso that accept foreign currency in the form of Mexican pesos. The second is whether firms accept pesos at premium or discount exchange rates. Among the 586 companies surveyed, only 77 accept pesos (a 13.1% acceptance rate). The results suggest that the degree of currency substitution via peso acceptance in the El Paso retail sector is small relative to other border metropolitan areas in either Texas or the northern border of the United States (Pisani & Yoskowitz, 2006). Perhaps this is a function of size where El Paso is connected and interdependent with Mexico, but not dependent on Mexico like other border communities.

Estimation results highlight some of the factors that are associated with the business decision to charge a premium conversion rate or offer a discount exchange rate, as well as the effective exchange rate at which firms accept pesos for purchases of goods and services. Most firms who engage in currency substitution receive a premium for doing so. In essence, these firms provide a desired customer service to cross-border shoppers, albeit at a profit. Nevertheless, about one-third of peso accepting firms offer a discount. Perhaps some of these firms wish to enhance sales or unwittingly set an unprofitable exchange rate using somewhat dated sources (e.g., newspaper). Businesses in the bakeries and tortillerias, retail clothing, and convenience stores/gasoline stations retail segments accept pesos at a loss, potentially as means to increase sales volumes. We do know from our least squares model that as total sales in pesos increases, the effective exchange rates declines for firms accepting pesos

in their business operations. In essence, firms trade off lower peso exchange rates for increased sales. Hence firms must feel they make more on (and value more) the sale than on the conversion procedure.

Grocery stores and beauty salons are the most adept at charging a premium, perhaps a result of thin profit margins and added pressure to get it right. Those who believe currency substitution enhances sales also earn a premium, an internal business policy choice by design. Businesses that do not convert pesos received during currency substitution transactions also charge premia. This may suggest that these firms have strong business and cultural ties to Mexico and use the premia to increase profits while interacting with the Mexican economy on their own currency terms.

In summary, this study provides empirical evidence regarding the determinants of premium and discount exchange rates in the El Paso retail market. Furthermore, it sheds additional light on a relatively unknown area of currency substitution: reverse dollarization. Additional studies of peso acceptance in retail sectors for other border metropolitan economies would be helpful as a step toward better understanding currency substitution in dual currency environments. Like spicy food, reverse dollarization or currency substitution may be an acquired taste.

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Appendix: Variable Definitions and Mnemonics

Variables	Definitions & Sub-Variable Labels
CNVREF	Source used to set peso to dollar conversion rate; (1) NEWS: newspapers; (2) BANKCASA: *casa de cambio* or bank; (3) CENTRAL: central office; (4) FIX: fixed exchange rate; (5) OTHER: other reference
FIRMTYPE	Firm demographic question: (1) LOCAL: local; (2) REGIONAL: regional; (3) NAT: national; (4) INT: international
DIST	Distance in miles from business to the nearest international border crossing
YEAR	Number of years firm has operated in local market
CROSSBORDER	Qualitative discrete variable for firms with cross border operations
YEARPESO	Number of years firm has accepted pesos
PESODISP	Discrete variable for method utilized to dispose pesos: (1) USBANK: US Bank; (2) MEXBANK: Mexican bank; (3) CASA: *casa de cambio* exchange house; (4) INTMEX: internal operations in Mexico; (5) INTUS: internal operations in USA; (6) MONEX: money exchanger (itinerant); (7) DONTEX: firm does not exchange pesos; (8) OTHERDISP: other
REA	Discrete variable for how peso disposal method selected: (1) CONV: convenience; (2) PROX: proximity; (3) HABIT: habit; (4) OTHEREA: other
PESOWEEK	Time spent each week to exchange and dispose pesos
TIPRE	Time spent each week to prepare for peso acceptance
CONTIME	Qualitative discrete variable for exact time at which business firm converts pesos to dollars or if it does not convert at all: (1) SDAY: same day conversion to dollars; (2) A1TO2DAY: 1-2 day conversion to dollars; (3) B3TO4DAY: 3-4 day conversion to dollars; (4) WEEK: once per week conversion to dollars; (5) DONCON: do not convert pesos to dollars
WHOCON	Qualitative variable for authority to accept pesos: (1) OWNER: owner; (2) MANAGER: manager; (3) OTHERWHO: other
MEXCREDIT	Qualitative variable for Mexican credit card acceptance
SEGMENT	BAKERY, dummy variable for the bakery and tortillería business firm category; CLOTH, dummy variable for the retail clothing business firm category; FOOD, dummy variable for restaurant business firm category; GAS, dummy variable for the convenience store/gasoline station firm category; GENERAL, dummy for the general merchandise/discount merchandise firm category; GROC, dummy variable for the grocery store business firm category; HAIR, dummy variable for the beauty salon business firm category; HOTEL, dummy variable for the general hotel/motel business firm category; LIQUOR, dummy variable for the beer and liquor store business category
NEMP	Number of employees working for business firm
PESOSALE	Percentage of sales in pesos
AVEDOLL	Average sales per week in dollars: (1) A1TO5000: $0 to $5,000 weekly; (2) B25000: $5,001 to $25,000 weekly; (3) C100000: $25,001 to $100,000 weekly; (4) MORE: $100,001 or more; (5) UNKNOWN: unsure or don't know
ADS	Whether firm advertises that it accepts pesos
HELP	Whether accepting pesos increases sales
LANG	Language in which interview is conducted
SPAN	Percentage of business staff that speaks Spanish
PREMI	Calculated premium, breakeven, or discount exchange rate (Least squares equation dependent variable)
PREMIUM	Dummy variable for exchange rate premium or discount (Logit equation dependent variable)
POS	Interviewee position with firm: (1) OW: owner; (2) MAN: manager; (3) OTHEPOS: other
PERCPREM	Qualitative variable for firm reported premium, discount, and breakeven exchange rates: (1) ABOVE: above; (2) BELOW: below; (3) EQUAL: equal
CHARDIS	Discrete variable for charging discount exchange rate
CHARPREM	Qualitative variable for charging discount exchange rate
DYOPEN	Days per week firm is open
FAKEPES	Qualitative discrete variable for firms that have previously received fake pesos in the past
HROPEN	Hours per day firm is open
LOW	Dummy for firms with peso purchase lower limits
MAX	Dummy for firms with peso purchase upper limits
PERCDIST	Firm's perceived distance in miles to the nearest border crossing
FOODTDRINK	Compacted categorical variable where the food/drink firm categories (bakeries and tortillerias, beer and liquor stores, restaurants, and grocery stores) = 1 and non-food/drink firm categories (hair salons, gas and convenience stores, clothing stores, hotels/motels, and general merchandise/discount merchandise) = 0
LIQUORHAIR	Compacted dummy variable accounting for hair salons and liquor stores

Table 1
Descriptive Statistics – All Firms (n=586)

Variable	Mean	Std. Dev.	Low	High
Number of Employees	16.6	38.5	0	600
Time in Community (Years)	14.6	16.3	0.03	201
Distance to the Border (miles)	6.1	3.7	0.05	48.0
Staff who Speak Spanish (%)	88.6	0.2	0	100
Have Cross-Border Busn. Opers? (%) (Yes=1)	5.1	0.2	0	100
Business Hours per Day	13.3	5.4	4	24
Business Days per Week	6.6	0.70	1	7

Table 2: Peso Acceptance Data by Retail Category (n=77)

Retail Category	Accept Pesos		Do Not Accept Pesos	
	Number	Percent	Number	Percent
Bakeries & Tortillerias	4	13.3%	26	86.7%
Beer & Liquor Stores	2	6.7%	28	93.3%
Beauty Salons	10	8.9%	102	91.1%
Convenience & Gasoline	8	16.0%	42	84.0%
Restaurants	13	9.4%	126	90.7%
Grocery Stores	14	28.0%	36	72.0%
Pharmacies	0	0.0%	30	100.0%
Retail Clothing	14	26.4%	39	73.6%
Hotel/Motel	4	8.9%	41	91.1%
General & Discount	8	17.0%	39	83.0%
Total	77	13.1%	509	86.9%

Notes:
Numbers and percentages of firms by market segment that reject or accept pesos as means of payment.
Convenience & Gasoline includes convenience stores and gasoline stations.
General & Discount includes general merchandise and discount merchandise stores.

Table 3:
Premium and Discount Conversion Charges by Retail Segment (n=73)

Retail Category	Charge Premia		Offer Discounts	
	Number	Premium	Number	Discount
Bakeries & Tortillerias	1	0.1771	3	-0.0802
Beer & Liquor Stores	1	0.1948	1	-0.0178
Beauty Salons	7	0.9886	0	n/a
Convenience & Gasoline	7	1.9022	1	-0.1805
Restaurants	8	0.6669	5	-0.1794
Grocery Stores	12	0.8883	2	-0.0486
Retail Clothing	8	1.0099	6	-0.2675
Hotel/Motel	1	0.4675	2	-1.2688
General & Discount	5	0.8008	3	-0.6831
Total	50	1.0001	23	-0.3315

Notes:

Numbers of firms that charge premia or offer discounts on peso conversion rates. Hotels and Beauty Salons have one and three observations missing, respectively. There are four observations missing in total. Convenience & Gasoline includes convenience stores and gasoline stations. General & Discount includes general merchandise and discount merchandise stores.

Table 4:
Logistic Regression Model for Charging a Peso Conversion Premium

Variable	Coefficient	Standard Error	z-Statistic	Probability
Constant**	5.2947	2.6019	2.0349	0.0419
LOCAL***	-10.2170	3.5461	-2.8812	0.0040
BAKERY*	-3.6318	1.9038	-1.9077	0.0564
CLOTH*	-1.9197	1.0818	-1.7745	0.0760
GAS*	-3.4116	1.8747	-1.8199	0.0688
GROC*	2.5348	1.4187	1.7867	0.0740
NEWS*	-1.5016	0.8822	-1.7020	0.0888
CENTRAL***	-6.4490	2.4056	-2.6808	0.0073
HELP***	2.5737	0.9855	2.6114	0.0090
A1TO5000**	4.8121	2.1032	2.2880	0.0221
B25000**	4.1392	2.0737	1.9960	0.0459
UNKNOWN**	4.8290	2.0165	2.3948	0.0166
ABOVE**	2.8331	1.1522	2.4590	0.0139
PROX	-1.5786	1.0435	-1.5128	0.1303
DONCON*	2.4439	1.3062	1.8710	0.0613
McFadden R-squared	0.4405			
Standard Error of Regression	0.3773			
Sum of Squared Residuals	8.2579			
Schwarz Information Criterion	1.5788			
Log likelihood	-25.4489			
Restricted Log Likelihood	-45.4860			
LR Statistic	40.0743			
Average Log Likelihood	-0.3486			
Probability (LR Statistic)	0.0002***			

Notes:
***, **, and * imply statistical significance at the 1-, 5-, and 10-percent levels, respectively.

Table 5:
Least Squares Regression Model for Charging a Peso Conversion Premium

Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant	0.1333	0.1542	0.8646	0.3905
ABOVE***	0.6780	0.1599	4.2411	0.0001
PESOSALE***	-3.6293	0.9848	-3.6852	0.0005
HELP**	0.4806	0.1818	2.6438	0.0103
B3TO4DAY*	-0.5629	0.3011	-1.8693	0.0662
OTHERDISP**	-0.6225	0.2814	-2.2121	0.0306
OTHEREA**	0.5323	0.2210	2.4080	0.0190
HAIR*	0.5319	0.2785	1.9097	0.0607
HOTEL	-0.7566	0.4568	-1.6561	0.1027
R-squared	0.5422	Dependent Variable Mean		0.5526
Adjusted R-squared	0.4840	Dep. Var. Standard Deviation		0.8934
Standard Error of Regression	0.6417	Akaike Information Criterion		2.0671
Sum Squared Residuals	25.9427	Schwarz Information Criterion		2.3517
Log Likelihood	-65.4156	Hannan-Quinn Criterion		2.1804
F-statistic	9.3257	Durbin-Watson Statistic		2.2596
Probability (F-statistic)	0.0000***			

Notes:
***, **, and *imply statistical significance at the 1-, 5-, and 10-percent levels, respectively.

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The authors of this publication are UTEP JP Morgan Chase Bank Professor Tom Fullerton and UTEP Associate Economist Teodulo Soto. Dr. Fullerton holds degrees from UTEP, Iowa State University, Wharton School of Finance at the University of Pennsylvania, and University of Florida. Prior experience includes positions as Economist in the Executive Office of the Governor of Idaho, International Economist in the Latin America Service of Wharton Econometrics, and Senior Economist at the Bureau of Economic and Business Research at the University of Florida. Teodulo Soto holds a B.B.A. in Economics from UTEP and has published research on cross-border regional growth patterns.

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The UTEP Border Region Modeling Project & UACJ Press

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Professor Barraza is an award winning economist who has taught at several universities in Mexico and has published in academic research journals in Mexico, Europe, and the United States. Dr. Barraza currently serves as Research Provost at UACJ. Professor Fullerton has authored econometric studies published in academic research journals of North America, Europe, South America, Asia, Africa, and Australia. Dr. Fullerton has delivered economics lectures in Canada, Colombia, Ecuador, Finland, Germany, Japan, Korea, Mexico, the United Kingdom, the United States, and Venezuela.

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Contributors to the book include economic researchers from the University of Texas at El Paso, New Mexico State University, University of Texas Pan American, Texas A&M International University, El Colegio de la Frontera Norte, and the Federal Reserve Bank of Dallas. Their research interests cover a wide range of fields and provide multi-faceted angles from which to examine border economic trends and issues.

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Professor Calderón is an award winning economist who has taught and published in Mexico, France, and the United States. Dr. Calderón spent a year as a Fulbright Scholar at the University of Texas at El Paso. Professor Fullerton has published research articles in North America, Europe, Africa, South America, and Asia. The author of several econometric forecasts regarding impacts of the Brady Initiative for Debt Relief in Latin America, Dr. Fullerton has delivered economics lectures in Canada, Colombia, Ecuador, Finland, Germany, Japan, Korea, Mexico, the United States, and Venezuela.

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