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Are Brand Name Medicine Prices Really Lower in Ciudad Juárez?

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Technical Report TX10-1

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The University of Texas at El Paso

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UTEP Border Region Modeling Project

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Are Brand Name Medicine Prices Really Lower in Ciudad Juárez?*

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Abstract

Relatively high brand name pharmaceutical prices have led many United States residents to cross the border into Mexico as “medical tourists.” To examine the savings potentially available to consumers willing to cross into Mexico, data are collected and analyzed for brand name prescription medicines sold in El Paso, Texas and Ciudad Juárez, Mexico. Retail pharmacy prices are generally lower on the south side of the border and substantial savings result for some medicines. For some products, however, shelf prices are lower on the north side of the border.

Key Words: Brand Name Medicine Prices, United States Mexico Border.

JEL Categories: I11, Health Markets; M21, Business Economics; P52, Comparative Studies.

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Introduction

In 2006, United States consumers spent nearly \$285 billion for prescription medication and other pharmaceutical products (Johnson, 2007). As medicine prices have

escalated, many consumers have crossed the borders to Canada or Mexico to obtain savings (Casner and Guerra, 1992). Those savings are frequently quite large. Danzon and Furukawa (2004) report evidence for patented brand name medications in nine countries whose prices are 28-to-42 percent lower than those charged in the United States. Individuals are allowed to import up to 90 days' worth of medications for personal use. Accordingly, "medical tourists" frequently make short journeys across the borders into Canada or Mexico to visit pharmacies. Medical tourism is a two-way street, however, with large numbers of persons also entering the United States to purchase both medicines and health care services (Vargas Hernández, 2006).

Popular perception suggests that substantial savings can be gained by purchasing brand name prescription medications in Mexico (Calvillo and Lal, 2003). To date, however, these savings have not been systematically quantified. This study utilizes cross-border data collected in Ciudad Juárez, Mexico and El Paso, Texas to examine brand name retail medicine price differences between the United States and Mexico. These "borderplex" sister cities jointly comprise a metropolitan economy that is home to more than 2.1 million residents. Cross-border commercial interaction is pronounced: roughly 14.3 million automobiles and 8.0 million persons annually traverse the international bridges from Ciudad Juárez to El Paso (Fullerton and Molina, 2007). Given that, results in the paper are likely to provide a good starting point from which to examine the issue of brand name medicine price differences between Mexico and the United States. The central question examined is if brand name prescription medication price equality exists across the Rio Grande River. The null hypothesis formally tested is that the mean price for brand name prescription medications in Ciudad Juárez is equal to that in El Paso.

Generic medications are not included in the study. Some studies have found that prices of generic medications in other countries are similar to or more expensive than those found in the United States. For example, Danzon and Furukawa (2004) find generic drug prices to be lower in the United States than in Chile, France, Germany, Italy, Japan, Mexico, and the United Kingdom. That study also points out that generic drug sales represent only 18 percent of total medicine sales in the United States. Excluding generics from the analysis at hand should not lead to misleading results.

That not all medicines are universally more expensive in the United States may come as a surprise, but that is one reason cross-border pharmacy visits are a two-way street. In general, pharmaceutical prices should tend to be lower in Mexico. One reason is that regulatory obstacles are less pronounced in Mexico, reducing the cost of production (Soberón and Urquidi, 1992). A second is that product liability costs are generally lower outside of the United States due to legal system differences (Manning, 1997; Graham and Walker, 2000). A third is that wage, some input, and many non-tradable costs are lower in Mexico than in the United States, further contributing to price differentials between the two markets (Fullerton and Coronado, 2001; Blanco González and Fullerton, 2006). The sample collected to examine this possibility is from "brick and mortar" pharmacies in El Paso and Ciudad Juárez where medical tourists purchase prescription and other medicines (Skolnick, 1995). The phrase brick and mortar is used to distinguish physical retail pharmacy stores from their Internet counterparts (Quon, Firszt, and Eisenberg, 2005).

The study is organized as follows. A review of the literature is presented in the next section. Data and methodology are described in the third section of the paper. Empirical results are summarized in next section. Conclusions and suggestions for future research comprise the final set of material.

Literature Review

A number of research efforts have been directed toward questions regarding medicine price differences between the United States and the rest of the world. Several of those studies indicate that brand name medicine prices tend to be higher in the United States than elsewhere. Danzon and Furukawa (2004) show name brand medicine prices in Japan to exceed those of the United States, while those of Canada, Chile, France, Germany, Italy, Mexico and the United Kingdom are found to be lower. One recent study documents annual savings of approximately 24 percent if brand name medications are purchased from Canadian Internet pharmacies instead of from major online United States drug chain pharmacies (Quon, Firszt, and Eisenberg, 2005).

While many of the studies on this topic confirm the conventional wisdom that lower medicine prices are found outside of the United States, the evidence on this point is far from conclusive. In some cases, consumer protection

laws such as those found in Europe and other regions are found to have adverse impacts on prices (Danzon and Chao, 2000a). Industry structure and regulatory interactions across markets can also lead to unanticipated pricing patterns (Mujumdar and Pal, 2005). Perhaps more importantly, international price differentials often reflect product characteristics that have nothing to do with market structure and regulatory burdens. Danzon and Chao (2000b) find that drug price comparisons can be skewed by poor sampling design and weighting schemes. For representative samples, hedonic product considerations such as the quality of the active ingredient molecules are often found to explain price gaps. That study also reports evidence that, contrary to popular opinion, pharmaceuticals in the United States are frequently not as expensive as they are in overseas markets.

For brand name medicines, many empirical studies do report evidence that points to higher prices in the United States. That is especially the case during periods when patent protection is provided to new products (Wagner and McCarthy, 2004). When patent protections are in place in the United States, regulatory restrictions tend to be less prevalent in other countries (Light and Lexchin, 2005). Lower incomes are also observed in most markets outside of the United States, leading many companies to utilize differential pricing strategies as a means towards profit maximization (Ridley, 2005). Although higher brand name product prices may result in the United States as a consequence of factors such as these, evidence to date does not point to any easily discernible pricing gap patterns relative to overseas markets. Global pricing data from 1999 confirm that observation for Mexico in particular (Danzon and Furukawa, 2006).

Because standard pricing patterns across national boundaries are hard to identify, it may be helpful to collect and analyze data on a case by case basis. Although large numbers of United States residents cross the border to purchase medications in Mexico, relatively little research has been completed regarding the pricing differentials that encourage consumers to travel south for these products (Skolnick, 1995; Vargas Hernández, 2006). This study carries out such an exercise for “brick and mortar” pharmacies in El Paso, Texas and Ciudad Juárez, Mexico. Research for other products in this segmented regional market indicates that higher prices will likely be charged for goods sold in El Paso (Fullerton and Coronado, 2001),

but this has yet to be documented for health care items. The presence of a tightly controlled border will also serve to limit the extent to which arbitrage might otherwise reduce persistent price differentials (Ridley, 2005; Blanco González and Fullerton, 2006).

Data and Methodology

Pricing data are collected only for brand name pharmaceutical products. As noted above, those are the medicines that account for the largest percentage of sales in the United States and also tend to be associated with the greatest price differentials. The sample also excludes Internet pharmacy prices. That step is taken because data collected by The University of Texas at El Paso Border Region Modeling Project indicate that Internet prices follow different patterns than those of retail pharmacies. In particular, Internet pharmacy prices in Mexico often exceed those charged in the United States by double digit margins. Because that runs counter to what income differentials between the two countries would imply, it will eventually be useful to examine those pricing data more closely (Danzon and Furukawa, 2004). However, such an analysis goes beyond the scope of this study.

Quon, Friszt, and Eisenberg (2005) compile a list of 50 brand name medications from the most popular pharmaceuticals that are purchased on-line by sales volume. Of the 50 most popular medications, 4 are generic and, therefore, are left out of this study because of empirical evidence that point to consistently lower prices in the United States (Danzon and Furukawa, 2004). Two brand name drugs, Flonase (fluticasone propionate, GlaxoSmithKline, Philadelphia, PA) and Toprol-XL (long-acting metoprolol succinate, AstraZeneca, Wilmington, DE), are also excluded from the sample due to a lack of comparative cross-border pricing data in El Paso and Ciudad Juárez. Table 1 lists the 44 drugs considered for use in this study as well as the companies that manufacture them.

Walgreens is selected as the pharmacy for the El Paso, Texas pricing data. It is one of the top drug store chains by dollar sales volumes in the United States (Frederick, 2007). In El Paso, approximately two-dozen Walgreens operated during 2006. Its stores tend to be conveniently located near major shopping centers and/or thoroughfares, and large numbers of local residents use its pharmacy services when purchasing prescription medications. These

walk-in pharmacies are also found near many of the retail locations visited by shoppers from Mexico. Given those factors, Walgreens is likely to provide representative pharmaceutical prices for the El Paso market.

Prices for medicines sold by Walgreens in El Paso are from the week of 29 June 2006. Because collecting the walk-in price data is both costly and time consuming, the information could only be obtained once and only for stores located in El Paso and Ciudad Juárez. The Walgreens store where the prices are from is located near a major Interstate 10 exit within the city limits. The same week is used for the store price data collected in Ciudad Juárez.

The market in Mexico is primarily divided into two categories: small traditional pharmacies and larger retail pharmacy chains. Entry barriers in Mexico are fairly low and any person can run a pharmacy. No academic degree or similar professional certification is required. Unlike in other countries, pharmacies in Mexico only sell the medicines; they do not mix them, set dosages, or package them. As a consequence, the retail pharmacy market is more fractured than it is in many countries and competition is intense (OECD, 2001). Accordingly, medicine prices in Ciudad Juárez are from three sources. One is a chain supermarket with a pharmacy department (SMart), the second is from a large retail pharmacy chain (Farmacia Benavides), and the third is a medicine distributor that sells to small independent pharmacies (Medimex).

Wholesale prices and the suggested retail prices are listed in the Medimex catalog distributed to small pharmacies in Ciudad Juárez and other markets throughout Mexico. Medimex provides a discount to pharmacies for prompt payment. To be competitive with the chain pharmacies, some of the small traditional pharmacies sell medicines at the wholesale price and cover costs by receiving the prompt payment discount from Medimex. The wholesale price from Medimex is thus recorded as the minimum retail price while the suggested retail price is treated as the maximum price that small drug stores charge for medications. Chain pharmacies such as SMart or Farmacia Benavides are better able to take advantage of economies of scale and economies of scope, allowing them to establish their own prices.

From the list of 44 brand name medications shown in Table 1, five are excluded because they are not available at all of the pharmacies included in the study. Actonel, Celexa, and Zoloft are not available at the SMart chain supermarket pharmacy departments in Ciudad Juárez. Levoxyl is not marketed by Medimex in Ciudad Juárez, while Bextra has been removed from the market and is no longer available. Consequently, the sample size is reduced to 39.

To minimize the potential effects of daily price fluctuations, all “brick and mortar store” pricing data are from the information collected in both cities during the week of 29 June 2006. The Medimex distributor prices for small pharmacies are collected from the June 2006 catalogs. Prices for medicines in El Paso, Texas are reported in United States dollars and the prices for medicines in Ciudad Juárez are reported in Mexican pesos. Peso prices are converted into dollars using the average nominal peso per dollar exchange rate for both the week of 29 June 2006 and the month of June 2006.

To minimize the effect of lot size on price, lot size differences are maintained as small as possible between the two cities. Bigger lot sizes allow for substantial savings from bulk purchases. The smallest lot size available is selected for the medications in El Paso and the biggest lot size is selected for medicines in Ciudad Juárez. That step is taken because lot sizes in the United States are usually larger than those in Mexico. To insure product homogeneity, dosages and strengths are kept the same for both cities (Danzon and Kim, 1998). In one instance (Neurontin) where an equal dose is not available in the two markets, the difference is kept as small as possible. Prices per unit of consumption are used as the bases for comparison.

Once the unit prices for each of the medicines are calculated for both Ciudad Juárez and El Paso, then the price differences per unit are calculated. Those differences indicate whether consumers can save money by purchasing a medication in Ciudad Juárez instead of from a retail chain pharmacy in El Paso. Cost per year for a single patient is calculated by multiplying unit prices by the number of units consumed per year. That step is taken to provide an estimate of the annual expenditures, in dollars, consumers will pay for each brand name medicine. Implied savings per year are calculated by subtracting the amount paid per year in El Paso from the amount paid per year in Ciudad

Juárez. Other comparative pricing studies such as Quon, Firszt, Eisenberg (2005) have shown that brand name medicines are not always more expensive in the United States. Because medical tourism along the border is a north and south phenomenon, that possibility cannot be ruled out for the borderplex. Negative values for savings per year will result if unit prices in El Paso chains are lower than those charged across the border in Ciudad Juárez.

To examine departures from the law of one price for these products, peso to dollar price ratios are also calculated between the four sets (Medimex minimum, Medimex maximum, SMart, and Benavides) of Ciudad Juárez unit prices and the corresponding data for El Paso. Those ratios are then tested for deviations relative to the peso per dollar exchange rate. Comparison to the exchange rate is appropriate because it provides a multi-product benchmark that consumers in border markets throughout the world readily understand (Asplund and Friberg, 2001; Blanco González and Fullerton, 2006). When the price ratio is greater than the exchange rate, it indicates that the product is more expensive in Mexico. Similarly, when the price ratio is lower than the exchange rate, it indicates that the product is more expensive on the north side of the river.

Earlier empirical evidence indicates menu costs cause border retail product prices to fluctuate less frequently than currency quotes (Fullerton and Coronado, 2001). Given that, two average nominal exchange rates are used for the t-tests. One set of computed test statistics is calculated using the monthly average exchange rate for June 2006 which matches the duration of the Medimex catalog prices. The second set of test statistics is calculated using the average of the spot rate for the five business days of the week of 29 June 2006. That reflects the fact that the prevailing daily exchange rate is the relevant rate for price comparisons, and currency selection, at the time of purchase.

Empirical Analysis

To shed light on the question of whether brand name prescription medications are less expensive in Ciudad Juárez than in El Paso, pricing data from both sides of the border are analyzed. For El Paso, the data are collected from Walgreens, a retail chain pharmacy with a large presence across the city. For Ciudad Juárez, the data are

from three sources. SMart is a large chain supermarket with its own pharmacy department. Benavides is a large retail pharmacy chain with stores throughout much of Ciudad Juárez as well as Mexico as a whole. The final source for south of the border pharmaceutical prices is Medimex, a medicine distributor from which many small pharmacies in Mexico obtain their products. Prices per unit, savings per unit, percent savings, cost per year for a single patient, and the savings achieved by purchasing medicines in Ciudad Juárez rather than in El Paso are calculated and presented below.

Summary statistics for the sample data, adjusted for lot sizes and dosages, are shown in Table 2. El Paso prices, per unit, in dollars, are shown in Column 3. The corresponding four sets of peso prices for Ciudad Juárez are presented relative to the El Paso dollar prices in Columns 4 through 7. All four of the peso-to-dollar price ratio means fall below the June 2006 nominal exchange rate of 11.3934 pesos per dollar. The Jarque-Bera normality test (Bera and Jarque, 1981) results at the bottom of Table 2 indicate that the peso-to-dollar medicine price ratios follow Gaussian distributions. Not reported in the table are Anderson-Darling distance test statistics (Stephens, 1974) that also confirm data normality for the price ratios. Data normality permits t-tests to be applied below, a condition that is not always met with the cross-border restaurant pricing data (Fullerton and Coronado, 2001).

Two-tailed t-tests are used to examine the null hypothesis of brand name medicine price equality between the two markets. As shown in Table 3, the Medimex minimum, SMart, and Farmacia Benavides prices reject the null hypothesis at the 5-percent level. In the case of the Medimex catalog maximum suggested retail prices, the prices in Mexico are lower than those charged by Walgreens in El Paso, but not by a statistically significant margin. Taken together, the information in Table 3 confirms that brand name prescription drugs are generally less expensive when purchased at pharmacies in Ciudad Juárez. Those results are similar to evidence earlier reported for cross-border restaurant price comparisons (Fullerton and Coronado, 2001; Blanco González and Fullerton, 2006). Consumers may find, however, that retail pharmaceutical prices on the south side of the border occasionally exceed those charged in El Paso or that the savings available to them are negligible.

Table 4 summarizes the dosage, lot size, price, consumption, and annual expenditure information for the medications if purchased on the north side of the border. Units taken per day are based upon those reported by Quon, Friszt, and Eisenberg (2005). As shown in Column 7, the expenditures per year for acquiring these medications can be fairly substantial. Given that, it is not surprising that many consumers cross the international bridges into Ciudad Juárez as a means for lowering their prescription drug bills. Potential savings available to consumers is considered next.

Table 5 compares small pharmacy minimum retail and suggested retail prices from the Medimex catalog to those charged by Walgreens in El Paso. As noted by Wilson (2004), substantial savings are available in many instances for consumers who are willing to cross the border to purchase prescription drugs. However, lower prices are not charged for all of the brand name medicines sold by Medimex to small traditional pharmacies in Ciudad Juárez. In particular, when small traditional pharmacies charge the suggested retail price, the prices are not statistically different from Walgreens prices. In Mexico, medicine price differentials can fluctuate up to 50 percent from one pharmacy to another one. For this reason, consumers potentially have to compare medicine prices at different locations in order to realize any savings when purchasing medications in Ciudad Juárez (Feria, 2001).

Savings per unit on brand name medicines sold at SMart and Farmacia Benavides (Table 6) are similar to the Medimex minimum retail prices. The average savings per unit at the two large retail pharmacies relative to prices in El Paso is approximately 29 percent. That translates into annual savings of roughly \$389 across all medicines included in the sample. The variances associated with the savings shown in Table 6 are fairly large. In some cases, retail pharmacy prices in El Paso are lower than those charged on the south side of the border. That observation runs counter to what might be expected given lower production costs in Mexico and potentially reflects drugstore heterogeneity in both markets (Sorenson, 2000).

Higher retail prices at the pharmacies in Mexico do not necessarily translate into higher effective prices per unit. That is because the medicines in the sample have to be purchased with a prescription in El Paso, but not

in Ciudad Juárez. It is thus possible for customers to pay higher unit retail prices in Ciudad Juárez, but face lower overall acquisition costs in cases when they skip prescription renewal visits to their physicians on either side of the border. To be accurate, the latter calculation would also have to include the higher financial costs of traveling to pharmacies on the south side of the river in Mexico for customers that reside in El Paso, plus the opportunity cost associated with time consuming transit delays on the return trips back across the border. For popular drugs such as Cialis, Levitra, and Viagra, large sales volumes to consumers from El Paso can potentially deplete inventories in Ciudad Juárez and cause higher retail prices to be observed in the lower income market (Wilson, 2004). A similar pattern may also help explain why Internet pharmacy prices in Mexico are frequently higher than those charged online in the United States.

To further examine the distribution of savings in each market, Table 7 lists those medications whose purchases in Ciudad Juárez generate nominal savings that are at least one standard deviation above the mean for a given set of price quotes. Supply limitations related to regulatory decisions helped increase prices in the United States for three of the medicines in Table 7 (Coreg, Glucophage, Zyprexa). For the other four medicines, demand is consistently strong in the United States and the cost of production is lower in Mexico. There does not, however, appear to be any clear reason why savings are so pronounced for these drugs.

Table 8 lists the medicines whose purchases in Ciudad Juárez result in nominal losses that are at least one standard deviation below the mean for a given set of price quotes. For Cialis, Levitra, and Viagra, sales at pharmacies south of the border are helped by the absence of any prescription requirements. For Effexor Extended Release and Pravachol, low cost generic versions became available in the United States in 2006, driving down prices north of the border. Allegra is not widely distributed in Mexico, pushing its price closer to what is charged in the United States. Similar to Corgo, Accupril is used to treat hypertension, but Accupril supplies were not affected by supply disruptions or limitations during the period in question. Again, there does not seem to be a particular cause that leads these medicines to be more expensive in Mexico.

Conclusion

The study at hand attempts to quantify brand name prescription medication price differences for the borderplex sister cities of Ciudad Juárez, Mexico and El Paso, Texas. Aggregate medicine price differences for the United States and Mexico utilizing cross sectional data have been calculated in previous studies. Brand name price differences for brick and mortar retail pharmacies have not previously been quantified using metropolitan market information. Recently, there has been considerable media attention given to United States citizens who traverse international boundaries to purchase prescription medications at lower prices. Medical tourism of this nature occurs on a daily basis between El Paso and Ciudad Juárez.

To examine price differences, a list of brand name prescription medications from Quon, Friszt and Eisenberg (2005) is utilized. Generic drugs are excluded from the study. Also excluded are Internet medicine prices, since the latter frequently exhibit different patterns than their in-store counterparts in Mexico. Medicine Prices in El Paso are collected from Walgreens, a retail chain pharmacy with a large local presence. Because the pharmacy sector in Mexico is relatively fractured, prices for Ciudad Juárez are collected from three sources. The first is Medimex, a medicine distributor to small independent retail pharmacies. The Medimex wholesale and suggested retail prices are taken as the minimum and maximum price, respectively, a small traditional pharmacy will charge. The next source is SMart, a chain supermarket with a pharmacy department. The third source is Farmacia Benavides, a large retail drugstore chain in Mexico.

Empirical evidence extracted from the sample data indicate that substantial savings are available to customers for many brand name prescription medicines when purchased in Ciudad Juárez. In general, the results are similar to those reported for cross-border franchise restaurant menu prices. Not all south-of-the-border retail pharmacy prices are lower than those charged in El Paso. Shelf prices are lower than actual acquisition prices and do not include, however, the prices that doctors charge to prescribe medicines or the financial and opportunity costs associated with traversing an international border. In some cases, the ability to purchase brand name drugs without prescriptions may be causing inventories to be depleted in Ciudad Juárez. The latter may be one reason why Internet medicine prices are frequently more expensive than in-store prices in Mexico.

Because the data in this study are from one region during a single week, further empirical research on this topic seems warranted. In particular, it would be helpful to collect additional brand name medicine prices for other border and non-border cities. That is because regional medicine price differentials will potentially vary as a consequence of geographic proximity such as noted for other products (Engel and Rogers, 1996; Jenkins, 1997). It would also be useful to collect pricing data across distinct time periods to permit analyzing cyclical as well as seasonal variations for different products included in the sample. Finally, separate analysis of Internet pricing patterns between Mexico and the United States also appears warranted due to the substantial differences that seem to distinguish the latter from the walk-in brick and mortar segment of the pharmaceutical market at large.

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Table 1
44 Brand Name Prescription Medications Considered

Drug Name	Manufacturer	City, State
Accupril	Pfizer	New York, NY
Actonel	Aventis	Bridgewater, NJ
Actos	Eli Lilly	Indianapolis, IN
Advair Diskus	GlaxoSmithKline	Philadelphia, PA
Allegra	Aventis	Bridgewater, NJ
Altace	Wyeth	Madison, NJ
Avandia	GlaxoSmithKline	Philadelphia, PA
Bextra	Pfizer	New York, NY
Celebrex	Pfizer	New York, NY
Celexa	Forest Pharmaceuticals	St. Louis, MO
Cialis	Eli Lilly	Indianapolis, IN
Coreg	GlaxoSmithKline	Philadelphia, PA
Cozaar	Merck	Whitehouse Station, NJ
Crestor	AstraZeneca	Wilmington, DE
Diovan	Novartis	East Hanover, NJ
Effexor	Wyeth	Madison, NJ
Evista	Eli Lilly	Indianapolis, IN
Flomax	Boehringer Ingelheim	Ridgefield, CT
Fosomax	Merck	Whitehouse Station, NJ
Glucophage	Bristol-Myers Squibb	New York, NY
Levitra	Bayer / GlaxoSmithKline	Pittsburgh, PA / Philadelphia, PA
Levoxyl	King Pharmaceuticals	St. Louis, MO
Lexapro	Forest Pharmaceuticals	St. Louis MO
Lipitor	Pfizer	New York, NY
Neurontin	Pfizer	New York, NY
Nexium	AstraZeneca	Wilmington, DE
Norvasc	Pfizer	New York, NY
Paxil	GlaxoSmithKline	Philadelphia, PA
Plavix	Bristol-Myers Squibb	New York, NY
Pravachol	Bristol-Myers Squibb	New York, NY
Premarin	Wyeth	Madison, NJ
Prevacid	TAP Pharmaceutical Products	Lake Forest, IL
Prilosec	AstraZeneca	Wilmington, DE
Propecia	Merck	Whitehouse Station, NJ
Protonix	Wyeth	Madison, NJ
Prozac	Eli Lilly	Indianapolis, IN
Singulair	Merck	Whitehouse Station, NJ
Viagra	Pfizer	New York, NY
Wellbutrin SR	GlaxoSmithKline	Philadelphia, PA
Zetia	Merck	Whitehouse Station, NJ
Zocor	Merck	Whitehouse Station, NJ
Zoloft	Pfizer	New York, NY
Zyprexa	Eli Lilly	Indianapolis, IN
Zyrtec	Pfizer	New York, NY

Table 2
Brand Name Prescription Medication Peso to Dollar Price Ratios

Drug Name	Walgreens Price US\$	Walgreens Price US\$ / Unit	Medimex Min Price Ratio Pcj / \$ep	Medimex Max Price Ratio Pcj / \$ep	S-Mart Price Ratio Pcj / \$ep	Bnvides Price Ratio Pcj/\$ep
Accupril	\$93.99	\$1.57	15.7827	20.1053	13.4034	12.386
Actos	\$178.99	\$5.97	9.9879	12.0988	9.6791	8.8196
Advair Diskus	\$188.99	\$3.15	2.6238	3.2594	2.6075	2.7408
Allegra	\$101.99	\$1.70	10.7293	13.3248	11.1493	11.7068
Altace	\$104.99	\$1.75	12.0279	14.9371	9.5509	8.9423
Avandia	\$190.99	\$6.37	8.3488	10.7036	8.8501	7.7013
Celebrex	\$189.99	\$3.17	9.9864	12.5613	8.3024	6.4255
Cialis	\$131.99	\$13.20	12.3176	15.3012	12.2411	10.6543
Coreg	\$131.99	\$2.20	2.2011	2.747	1.9229	2.3221
Cozaar	\$58.99	\$1.97	9.4362	11.8664	8.3065	7.2089
Crestor	\$92.99	\$3.10	7.4589	9.3236	7.4589	6.7104
Diovan	\$66.99	\$2.23	10.4805	13.019	9.1133	7.3997
Effexor Ext. Rls.	\$118.99	\$3.97	16.6776	20.5898	16.4719	13.8525
Evista	\$94.99	\$3.17	7.5182	9.107	7.2856	6.1285
Flomax	\$136.99	\$2.28	8.2699	10.4022	8.059	8.1358
Fosamax	\$89.99	\$3.00	8.6599	10.8901	8.7121	8.1676
Glucophage	\$83.99	\$0.84	2.5424	3.173	2.5384	2.1418
Levitra	\$114.99	\$11.50	13.2359	16.2623	13.0098	9.7574
Lexapro	\$78.99	\$2.63	10.5691	13.2114	10.5691	9.2809
Lipitor	\$115.99	\$3.87	10.1212	12.8934	10.3147	8.3241
Neurontin*	\$190.99	\$1.91	8.181	10.2332	8.1819	6.9351
Nexium	\$150.99	\$5.03	3.8942	4.8679	3.8943	2.9144
Norvasc	\$52.99	\$1.77	8.6771	11.0536	7.7375	6.2692
Paxil	\$97.99	\$3.27	8.4779	10.5975	8.4253	7.547
Plavix	\$134.99	\$4.50	7.0786	8.7911	7.0329	6.1613
Pravachol	\$110.99	\$3.70	10.9553	13.8675	9.9841	10.4642
Premarin	\$124.99	\$1.25	9.008	11.1209	8.8396	7.9391
Prevacid	\$151.99	\$5.07	6.1425	7.6781	6.1425	6.8423
Prilosec	\$136.99	\$4.57	3.2887	4.0983	3.6287	3.8256
Propecia	\$68.99	\$2.30	7.8297	9.8461	7.8769	7.8645
Protonix	\$118.99	\$3.97	8.13	10.0309	8.0247	9.0268
Prozac	\$149.99	\$5.00	5.5979	6.9547	5.5638	5.2086
Singulair	\$105.99	\$3.53	7.2025	9.0575	7.246	6.2978
Viagra	\$107.99	\$10.80	14.4152	18.3628	14.6902	12.5755
Wellbutrin SR	\$177.99	\$2.97	8.6295	10.922	10.4195	10.7432
Zetia	\$93.99	\$3.13	6.0453	7.5097	6.0134	5.6376
Zocor	\$149.99	\$5.00	8.7478	11.0007	7.7005	7.123
Zyprexa	\$219.99	\$7.33	6.194	6.9383	6.2445	6.6002
Zyrtec	\$73.99	\$2.47	7.2894	9.2858	7.4288	8.4531
Mean			8.5836	10.7179	8.3236	7.6214
Standard Dvn.			3.3363	4.2001	3.1465	2.7397
Skewness			0.2273	0.2315	0.2240	0.0224
Kurtosis			3.2175	3.1877	3.4288	2.9786
JB Statistic			0.4128	0.4056	0.6249	0.0040
Probability			0.8135	0.8165	0.7316	0.9980

June 2006 monthly average exchange rate = P/\$ 11.3934; Week of June 29 average exchange rate = P/\$ 11.3819.

All data collected during week of 29 June 2006 except Medimex price data which are from the June 2006 catalog.

* Dosage not equal in Ciudad Juarez and El Paso.

Table 3
Cross-Border Brand Name Pharmacy Price Difference
Computed t-statistics

Medimex Minimum Retail Prices	Medimex Suggested Retail Prices	S-Mart Shelf Prices	Benavides Shelf Prices
June 2006 monthly average exchange rate results: -5.2595*	-1.0044	-6.0928*	-8.5981*
Week of June 29 average exchange rate results: -5.2380*	-0.9873	-6.0699*	-8.5719*

* Rejects null hypothesis of cross-border price equality at 5-percent level.

Table 4
Brand Name Prescription Medication Prices in El Paso

Drug Name	Dose, mg	Lot Size	Price US \$	Price / Unit, US \$	Units per day	Cost / Year
Accupril	20	60	\$93.99	\$1.57	2	\$1,144
Actos	30	30	\$178.99	\$5.97	1	\$2,178
Advair Diskus**	250/50	60	\$188.99	\$3.15	4	\$1,134
Allegra	120	60	\$101.99	\$1.70	1	\$620
Altace	5	60	\$104.99	\$1.75	1	\$639
Avandia	8	30	\$190.99	\$6.37	0.5	\$1,162
Celebrex	200	60	\$189.99	\$3.17	1	\$1,156
Cialis	20	10	\$131.99	\$13.20	0.5	\$2,409
Coreg	6.25	60	\$131.99	\$2.20	2	\$1,606
Cozaar	50	30	\$58.99	\$1.97	1	\$718
Crestor	20	30	\$92.99	\$3.10	1	\$1,131
Diovan	160	30	\$66.99	\$2.23	1	\$815
Effexor Ext. Release	150	30	\$118.99	\$3.97	0.5	\$724
Evista	60	30	\$94.99	\$3.17	1	\$1,156
Flomax	0.4	60	\$136.99	\$2.28	1	\$833
Fosamax	10	30	\$89.99	\$3.00	0.5	\$547
Glucophage	500	100	\$83.99	\$0.84	3	\$920
Levitra	20	10	\$114.99	\$11.50	0.5	\$2,099
Lexapro	10	39	\$78.99	\$2.63	1	\$961
Lipitor	20	30	\$115.99	\$3.87	1	\$1,411
Neurontin*	400	100	\$190.99	\$1.91	3	\$2,091
Nexium	20	30	\$150.99	\$5.03	1	\$1,837
Norvasc	5	30	\$52.99	\$1.77	1	\$645
Paxil	20	30	\$97.99	\$3.27	1.5	\$1,788
Plavix	75	30	\$134.99	\$4.50	1	\$1,642
Pravachol	20	30	\$110.99	\$3.70	2	\$2,701
Premarin	0.625	100	\$124.99	\$1.25	1	\$456
Prevacid	30	30	\$151.99	\$5.07	0.5	\$925
Prilosec	20	30	\$136.99	\$4.57	1	\$1,667
Propecia	1	30	\$68.99	\$2.30	1	\$839
Protonix	40	30	\$118.99	\$3.97	1	\$1,448
Prozac	20	30	\$149.99	\$5.00	1	\$1,825
Singulair	10	30	\$105.99	\$3.53	1	\$1,290
Viagra	25	10	\$107.99	\$10.80	0.5	\$1,971
Wellbutrin SR	150	60	\$177.99	\$2.97	1	\$1,083
Zetia	10	30	\$93.99	\$3.13	1	\$1,144
Zocor	40	30	\$149.99	\$5.00	1	\$1,825
Zyprexa	5	30	\$219.99	\$7.33	1	\$2,677
Zyrtec	10	30	\$73.99	\$2.47	1	\$900

All data collected during week of 29 June 2006 except Medimex price data which are from the June 2006 catalog.

* Dosage not equal in Ciudad Juarez and El Paso.

** Cost per year based on 90 days of annual consumption.

Table 5
Brand Name Prescription Medicine Price Comparisons:
Walgreens vs. Medimex Catalog**

Drug Name	Medimex Wholesale (Minimum Retail) Prices			Medimex Suggested Retail Prices		
	Savings per Unit	Percent Savings	Annual Savings	Savings per Unit	Percent Savings	Annual Savings
Accupril	-\$0.60	-38%	-\$441	-\$1.20	-76%	-\$874
Actos	\$0.74	12%	\$269	-\$0.37	-6%	-\$135
Advair Diskus	\$2.42	77%	\$873	\$2.25	71%	\$810
Allegra	\$0.10	69%	\$36	-\$0.29	-17%	-\$106
Altace	-\$0.10	-6%	-\$37	-\$0.54	-31%	-\$197
Avandia	\$1.70	27%	\$310	\$0.39	6%	\$71
Celebrex	\$0.39	12%	\$143	-\$0.32	-10%	-\$117
Cialis	-\$1.07	-8%	-\$196	\$0.86	6%	\$156
Coreg	\$1.77	80%	\$1,292	\$1.67	76%	\$1,219
Cozaar	\$0.34	17%	\$123	-\$0.08	-4%	-\$29
Crestor	\$2.03	35%	\$390	\$0.56	18%	\$204
Diovan	\$0.18	8%	\$65	-\$0.32	-14%	-\$117
Effexor Ext. Rls.	-\$1.84	-46%	-\$336	-\$3.20	-81%	-\$584
Evista	\$1.08	34%	\$394	\$0.64	20%	\$233
Flomax	\$0.63	28%	\$230	\$0.20	9%	\$73
Fosamax	\$0.72	24%	\$131	\$0.13	4%	\$24
Glucophage	\$0.65	77%	\$712	\$0.61	73%	\$668
Levitra	-\$1.86	-16%	-\$339	-\$4.91	-43%	-\$896
Lexapro	\$0.19	7%	\$69	-\$0.42	-16%	-\$153
Lipitor	\$0.43	11%	\$157	-\$0.51	-13%	-\$186
Neurontin*	\$0.54	28%	\$591	\$0.19	10%	\$208
Nexium	\$3.31	66%	\$1,209	\$2.88	57%	\$1,052
Norvasc	\$0.42	24%	\$153	\$0.05	3%	\$18
Paxil	\$0.84	26%	\$459	\$0.23	7%	\$126
Plavix	\$1.70	38%	\$620	\$1.03	23%	\$376
Pravachol	\$0.14	4%	\$102	-\$0.80	-22%	-\$584
Premarin	\$0.26	21%	\$95	\$0.03	2%	\$11
Prevacid	\$2.73	46%	\$425	\$1.65	33%	\$301
Prilosec	\$3.25	71%	\$1,186	\$2.92	64%	\$1,065
Propecia	\$0.72	31%	\$263	\$0.31	13%	\$113
Protonix	\$1.14	29%	\$416	\$0.47	12%	\$171
Prozac	\$2.54	51%	\$927	\$1.95	39%	\$712
Singulair	\$1.30	37%	\$475	\$0.72	20%	\$263
Viagra	-\$2.86	-26%	-\$522	-\$6.61	-61%	-\$1,206
Wellbutrin SR	\$0.72	24%	\$263	\$0.12	4%	\$44
Zetia	\$1.47	47%	\$537	\$1.07	34%	\$391
Zocor	\$1.16	23%	\$423	\$0.17	3%	\$62
Zyprexa	\$3.35	46%	\$1,223	\$2.87	39%	\$1,048
Zyrtec	\$0.89	36%	\$324	\$0.46	19%	\$168
Mean	\$0.81	26%	\$333	-\$0.01	6%	\$96
Std. Dvn.	\$1.36	30%	\$443	\$1.96	37%	\$546
Skewness	-0.3317	-0.2836	0.4071	1.9596	-0.2252	-0.1104
Kurtosis	3.6008	3.0795	2.9939	5.9773	3.1907	3.2158
JB Statistic	1.3018	0.5329	1.0774	29.1854	0.3887	0.1548
Probability	0.5216	0.7661	0.5835	0.0000	0.8234	0.9255

All data collected during week of 29 June 2006 except Medimex price data which are from the June 2006 catalog.

* Dosage not equal in Ciudad Juarez and El Paso.

** Negative numbers indicate prices are more expensive, and annual expenditures are greater, in Ciudad Juarez.

Table 6
Brand Name Prescription Medicine Price Comparisons:
Walgreens vs. SMart and Benavides**

Drug Name	SMart Prices		Farmacia Benavides Prices			Annual Savings
	Savings per Unit	Percent Savings	Annual Savings	Savings per Unit	Percent Savings	
Accupril	-\$0.28	-18%	-\$204	-\$0.14	-9%	-\$100
Actos	\$0.90	15%	\$328	\$1.35	23%	\$492
Advair Diskus	\$2.43	77%	\$875	\$2.04	65%	\$734
Allegra	\$0.04	2%	\$15	-\$0.05	-3%	-\$17
Altace	\$0.28	16%	\$102	\$0.38	22%	\$137
Avandia	\$1.42	22%	\$259	\$2.06	32%	\$376
Celebrex	\$0.86	27%	\$314	\$1.38	44%	\$504
Cialis	-\$0.98	-7%	-\$179	\$0.86	6%	\$156
Coreg	\$1.83	83%	\$1,336	\$1.75	79%	\$1,279
Cozaar	\$0.53	27%	\$193	\$0.61	31%	\$223
Crestor	\$1.07	35%	\$390	\$1.19	38%	\$434
Diovan	\$0.45	20%	\$164	\$0.55	25%	\$203
Effexor Ext. Rls.	-\$1.77	-45%	-\$323	-\$1.49	-37%	-\$271
Evista	\$1.14	36%	\$416	\$1.36	43%	\$494
Flomax	\$0.67	29%	\$245	\$0.66	29%	\$242
Fosamax	\$0.71	24%	\$129	\$0.76	25%	\$138
Glucophage	\$0.65	77%	\$712	\$0.77	92%	\$844
Levitra	-\$1.63	-14%	-\$298	\$1.65	14%	\$301
Lexapro	\$0.19	7%	\$69	\$0.22	8%	\$79
Lipitor	\$0.37	10%	\$135	\$0.46	12%	\$167
Neurontin*	\$0.54	28%	\$591	\$0.64	33%	\$697
Nexium	\$3.31	66%	\$1,209	\$4.42	88%	\$1,615
Norvasc	\$0.57	32%	\$208	\$0.70	40%	\$256
Paxil	\$0.85	26%	\$465	\$0.95	29%	\$519
Plavix	\$1.72	38%	\$628	\$1.96	44%	\$716
Pravachol	\$0.46	12%	\$336	\$0.44	12%	\$320
Premarin	\$0.28	22%	\$102	\$0.31	25%	\$114
Prevacid	\$2.33	46%	\$425	\$2.09	41%	\$382
Prilosec	\$3.11	68%	\$1,134	\$2.95	65%	\$542
Propecia	\$0.71	31%	\$259	\$0.71	31%	\$259
Protonix	\$1.17	29%	\$427	\$1.04	26%	\$379
Prozac	\$2.56	51%	\$934	\$2.73	54%	\$998
Singulair	\$1.29	39%	\$497	\$1.48	42%	\$542
Viagra	-\$3.12	-29%	-\$569	-\$1.12	-10%	-\$204
Wellbutrin SR	\$0.25	8%	\$91	\$0.24	8%	\$88
Zetia	\$1.48	47%	\$540	\$1.58	50%	\$577
Zocor	\$1.62	32%	\$591	\$1.77	35%	\$639
Zyprexa	\$3.31	45%	\$1,209	\$3.13	43%	\$1,144
Zyrtec	\$0.86	35%	\$313	\$0.76	31%	\$275
Mean	\$0.83	27%	\$361	\$1.08	31%	\$417
Std. Dvn.	\$1.30	28%	\$429	\$1.09	26%	\$389
Skewness	-0.5298	-0.2380	0.3800	0.5418	0.0783	0.9559
Kurtosis	4.3211	3.4307	3.1138	4.5386	3.7296	4.2384
JB Statistic	4.6609	0.6696	0.9598	5.7548	0.9048	8.4316
Probability	0.0973	0.7155	0.6189	0.0563	0.6361	0.0148

All data collected during week of 29 June 2006 except Medimex price data which are from the June 2006 catalog.

* Dosage not equal in Ciudad Juarez and El Paso.

** Negative numbers indicate prices are more expensive, and annual expenditures are greater, in Ciudad Juarez.

Table 7
**Medicines with Annual Savings One Standard Deviation or
 More Greater than the Mean**

Medicine	Used to Treat
Advair Diskus	Asthma
Coreg	Hypertension
Glucophage	Diabetes Type II
Nexium	Heartburn
Prilosec	Heartburn
Prozac	Depression, obsessive compulsive disorder
Zyprexa	Schizophrenia, bipolar disorder

Table 8
Medicines with Annual Savings One Standard Deviation or
More Below the Mean

Medicine	Used to Treat
Accupril	Hypertension
Allegra	Hayfever
Cialis	Erectile dysfunction
Effexor Extended Release	Depression, anxiety
Levitra	Erectile dysfunction
Pravachol	Elevated cholesterol
Viagra	Erectile dysfunction

The University of Texas at El Paso

Announces

Borderplex Economic Outlook: 2009-2011

UTEP is pleased to announce the 2008 edition of its primary source of border business information. Topics covered include demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, water consumption, and cross border manufacturing. Forecasts are generated utilizing the 219-equation UTEP Border Region Econometric Model developed under the auspices of a corporate research gift from El Paso Electric Company.

The authors of this publication are UTEP Wells Fargo Professor Tom Fullerton and UTEP Associate Economist Angel Molina. 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. Angel Molina holds an M.S. in Economics from UTEP and has published research on cross-border regional growth patterns.

The border business outlook for 2009 through 2011 can be purchased for \$10 per copy. Please indicate to what address the report(s) should be mailed (also include telephone, fax, and e-mail address):

Send checks made out to University of Texas at El Paso for \$10 to:

Border Region Modeling Project - CBA 236
UTEP Department of Economics & Finance
500 West University Avenue
El Paso, TX 79968-0543

Request information from 915-747-7775 or amolina@utep.edu
if payment in pesos is preferred.



The University of Texas at El Paso

Announces

Borderplex Long-Term Economic Trends to 2028

UTEP is pleased to announce the publication of the 2009 edition of its primary source of long-term border business outlook information. Topics covered include detailed economic projections for El Paso and Las Cruces, plus maquiladora forecasts for Ciudad Juárez and Ciudad Chihuahua. Forecasts are generated utilizing the 219-equation UTEP Border Region Econometric Model developed under the auspices of a corporate research gift from El Paso Electric Company.

The authors of this new publication are UTEP Wells Fargo Professor Tom Fullerton and UTEP Associate Economist Angel Molina. 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 and International Economist in the Latin America Service of Wharton Econometrics. Mr. Molina holds an M.S. in Economics degree from UTEP and has conducted border-related research on numerous topics, including regional econometric forecast accuracy and cross-border economics growth patterns.

The long-term border business outlook through 2028 can be purchased for \$10 per copy. Please indicate to what address the report(s) should be mailed (also include telephone, fax, and e-mail address):

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500 West University Avenue
El Paso, TX 79968-0543

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The UTEP Border Region Modeling Project & UACJ Press

Announce the Publication of

Basic Border Econometrics

The University of Texas at El Paso Border Region Modeling Project is pleased to announce **Basic Border Econometrics**, a publication from Universidad Autónoma de Ciudad Juárez. Editors of this new collection are Martha Patricia Barraza de Anda of the Department of Economics at Universidad Autónoma de Ciudad Juárez and Tom Fullerton of the Department of Economics & Finance at The University of Texas at El Paso.

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.

Border economics is a field in which many unsubstantiated claims are often voiced, but careful empirical documentation is rarely attempted. **Basic Border Econometrics** is a unique collection of ten separate studies that empirically assess carefully assembled data and econometric evidence for a variety of different topics. Among the latter are peso fluctuations and cross-border retail impacts, border crime and boundary enforcement, educational attainment and border income performance, pre- and post-NAFTA retail patterns, self-employed Mexican-American earnings, maquiladora employment patterns, merchandise trade flows, and Texas border business cycles.

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.

A limited number of **Basic Border Econometrics** can be purchased for \$10 per copy. Please contact Professor Martha Patricia Barraza de Anda of Universidad Autónoma de Ciudad Juárez at mbarraza@uacj.mx to order copies of the book.

Texas Western Press

Announces

Inflationary Studies for Latin America

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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, Asia, and Australia. 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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