4-2021

Trade Clusters and USA Southern Border Transportation Costs: 1995-2015

Thomas M. Fullerton Jr.

Ernesto Duarte Ronquillo

Comments:
Technical Report TX21-1
A revised version of this study is forthcoming in *International Trade Journal*
T.M. Fullerton, Jr. and E. Duarte-Ronquillo, 2021, *Trade Clusters and USA Southern Border Transportation Costs: 1995-2015*, Technical Report TX21-1, El Paso, TX: University of Texas at El Paso Border Region Modeling Project.

THE UNIVERSITY OF TEXAS AT EL PASO

UTEP BORDER REGION MODELING PROJECT

TECHNICAL REPORT TX21-1

TRADE CLUSTERS AND USA SOUTHERN BORDER TRANSPORTATION COSTS: 1995-2015

This technical report is a publication of the Border Region Modeling Project and the Department of Economics & Finance at The University of Texas at El Paso. For additional **Border Region** information, please visit the
www.utep.edu/business/border-region-modeling-project
section of the UTEP web site.

Please send comments to Border Region Modeling Project - CBA 236, Department of Economics & Finance, 500 West University, El Paso, TX 79968-0543.

UTEP Border Region Econometric Modeling Project

Corporate and Institutional Sponsors:

El Paso Water
TFCU
National Science Foundation
UTEP College of Business Administration
UTEP Department of Economics & Finance
UTEP Center for the Study of Western Hemispheric Trade

Special thanks are given to the corporate and institutional sponsors of the UTEP Border Region Econometric Modeling Project. In particular, El Paso Water and The University of Texas at El Paso have invested substantial time, effort, and financial resources in making this research project possible.

Continued maintenance and expansion of the UTEP business modeling system requires ongoing financial support. For information on potential means for supporting this research effort, please contact Border Region Modeling Project - CBA 236, Department of Economics & Finance, 500 West University, El Paso, TX 79968-0543.

TRADE CLUSTERS AND USA SOUTHERN BORDER TRANSPORTATION COSTS: 1995-2015*

Thomas M. Fullerton, Jr.
Department of Economics & Finance
The University of Texas at El Paso
500 W. University Avenue
El Paso, TX, USA 79968-0543
Phone: 915-747-7747, Email: tomf@utep.edu

Ernesto Duarte-Ronquillo
GIGO Energy Transport
Calzada del Río 9831-A
Ciudad Juárez, Chihuahua, México 32413
Phone: 011-52-656-625-2525 Ext. 1522
Email: ronquillode@hotmail.com

Abstract: Fixed effects panel regression analysis is used to examine the impact of trade clusters on transportation costs along the southern border of the United States. CIF/FOB ratios are utilized as the transportation cost measures. Grubel-Lloyd and Herfindahl-Hirschman indexes are utilized to identify trade clusters in the sample. Data are assembled for four custom districts (El Paso, Laredo, Nogales, and San Diego) during a 20-year period between 1995 and 2015. Because cross-sectional residual dependence is present, parameter estimation is carried out using Driscoll-Kraay robust standard errors. 9/11 terrorist attack effects are taken into account in the fixed effects model. Empirical results suggest that trade clusters are associated with reduced transportation costs. These results stand in contrast with those obtained for the northern border of the United States, where trade clusters are accompanied by higher transportation costs.

Keywords: Border Economics; International Trade; Transportation Costs

JEL Classifications: F14, Empirical Trade Studies; R15, Regional Econometrics; R40, Transportation Costs

Acknowledgements: Financial support for this study was provided by City of El Paso Office of Management & Budget, El Paso Water, National Science Foundation Grant DRL-1740695, TFCU, UTEP Center for the Study of Western Hemispheric Trade, and UTEP Hunt Institute for Global Competitiveness. Helpful comments and suggestions were provided by Jim Peach, Adam Walke, and two anonymous referees. Econometric research assistance was provided by Omar Solís.

* A revised version of this study is forthcoming in ***International Trade Journal.***

INTRODUCTION

Trade clusters can affect transportation costs. As enterprises try to increase profitability, transportation cost management is crucial. Moreover, for international enterprises that take advantage of economies of scale, location near or inside trade clusters can be very helpful. Enterprises engaged in international trade, can sometimes lower transportation costs by placing production and distribution facilities in large customs districts that have clusters of similar firms and products flows (Globerman and Storer 2015).

Globerman and Storer (2015) define a trade cluster as a geographical concentration where similar industries or closely related industries trade merchandise. In the context of this study, trade clusters are the custom districts that contain all border ports of entry, on which the majority of imports from Mexico come to the United States. To determine whether a customs district can be identified as containing a trade cluster, Grubel-Lloyd and Herfindahl-Hirschman indices are calculated. These indices give information about degrees of similarity between exports and imports, plus extent of trade concentration, which are the two main concepts in the definition of a trade cluster (OECD 2002; Hays and Ward 2011).

Although a wide variety of studies examine industrial clusters and related implications for economic performance, there are relatively few studies of the effects of trade clusters on transportation costs. Because international trade between Mexico and United States has increased substantially since 1994 (Krueger 2000), an analysis of trade clusters and transportation costs can potentially yield helpful information. Historically the behavior of freight costs has not been well documented for the border between Mexico and the United States (Walke and Fullerton 2014).

This study attempts to partially fill that gap in the literature by evaluating the impact of U.S.-Mexico trade clusters on transportation costs. The methodology utilized has previously been applied to data collected for the northern border between Canada and the United States (Globerman and Storer 2015). For this effort, data from 1995 to 2015 for imports to the United States from Mexico are utilized. Data for four custom districts, Laredo, TX; El Paso, TX; Nogales, AZ and San Diego, CA, are employed. Trade cluster factors that partially affect transportations costs are included in the analysis along with other determinants such as fuel costs and distance.

Subsequent sections are organized as follows. A brief review of relevant literature is presented in the next section. Data and methodology are discussed in the subsequent material. The fourth section summarizes empirical results. Conclusions and suggestions for future research are presented in the final portion of the paper.

LITERATURE REVIEW

The North American Free Trade Agreement (NAFTA) went into effect in 1994. Under NAFTA, trade barriers between Mexico, Canada, and the United States were slowly reduced. Although trade between the United States and Mexico doubled in the ten years prior to NAFTA enactment, merchandise trade still accelerated once the agreement began to be implemented (Krueger 2000). The Mexico-United States border region attracted substantial investment because of the economies of scale and the transportation cost advantages that companies obtained by setting up operations in these territories (Hanson 2001; Peach and Adkisson 2000). Those developments gradually led to more infrastructure investment that further encouraged trade among the three countries (Jones, Ozuna, and Wright 1991; Peach and Adkisson 2000).

Many of the border area factories in northern Mexico are labor intensive assembly plants, with most of the inputs coming from the United States and the majority of the outputs going to the United States (Hanson 2001). Over time, agglomeration economies and other factors have encouraged business clusters to emerge in various border regions (Porter 2003; Delgado, Porter, and Stern 2016). Several cities located throughout the border region can be identified as "trade clusters." What is a trade cluster? Globerman and Storer (2015) define a trade cluster as a geographical concentration where similar industries and/or closely related industries trade merchandise.

As industry clusters develop, regional rates of business formation tend to accelerate and existing firms also expand (Delgado, Porter, and Stern 2010). As documented by Baptista and Swann (1998), firms located within business clusters generally exhibit faster rates of innovation with greater numbers of patents than other companies. Regional clusters are also associated with faster rates of employment growth and higher wages than non-cluster regions (Delgado, Porter, and Stern 2014). Not surprisingly, cluster impacts can also affect other aspects of regional economies. Globerman and Storer (2015) measures the impacts of trade clusters on transportation costs along the border between the United States and Canada. Those results indicate that clusters with few international ports and high levels of bilateral trade exhibit lower transportation costs. In contrast, clusters in which intra-industry trade predominates generally have higher transportation costs, principally as a result of just-in-time production and inventory strategies.

Regions do not have identical economic opportunities and the effects of clusters on specific economic variables will differ from place to place (Cortright 2006). In other words, each cluster is unique because of location, size, resource endowments, and policy environments. Results of clusters analyses will, accordingly, vary from region to region.

Transportation costs affect international commerce and investment. One reason maquiladora export manufacturing thrived for so long is low transportations costs (Hanson 2001). Freight and insurance are the main components of transportation costs. Those data are available from sources like the International Monetary Fund (IMF) and the U.S. Census Bureau (Anderson and Wincoop 2004).

Transportation costs are influenced by fuel prices, distance, infrastructure, geography, technology, and trade facilitation (Behar and Venables 2011). Although NAFTA eliminated numerous trade barriers between Canada, Mexico, and the United States, other obstacles that affect transportation costs are still in place. Customs inspections occur at international ports. National security measures also raise transport costs, increase border wait times, and hamper cross-border traffic flows (Fullerton 2007). Queuing delays, fees, and document preparation also affect transportation costs in border regions (Anderson 2012).

Walke and Fullerton (2014) provide empirical evidence that the U.S.-Mexico border "thickened" due to increased security measures at international ports following the 9/11 terrorist attacks. Border "thickening" also occurred along the border with Canada (Globerman and Storer 2008; 2015), where security measures impacted border wait times. Das and Pohit (2006) also document that delays at international ports can result from infrastructure deficiencies. For example, exporting across the India-Bangladesh border can add four days, or more, to delivery times.

Trade cluster identification has not previously been attempted for the border between Mexico and the United States. Doing so may help quantify various aspects of this region and cross-border commerce that are not well documented. The data and methodology utilized in this effort, including model development, are discussed in the next chapter.

DATA AND METHODOLOGY

Annual time series data from 1995 to 2015 are gathered for analysis. The data collected correspond to the four United States customs districts that are located along the southern border with Mexico. As noted by Globerman and Storer (2015), it would be ideal if data were available at the individual port level, but the United States International Trade Commission only reports data by customs district. Trade data by individual port can be obtained from the Bureau of Transportation Statistics, but only in aggregate form. For the calculation of trade cluster variables, the data are needed at the 6-digit level of the Harmonized Tariff Schedule *(HTS)*. The four customs districts are: Laredo, El Paso, Nogales, and San Diego. In 2015, more than 88% of imports from Mexico entered the United States through these districts (USITC 2016). Each district has several ports of entry. Appendix A lists the ports that correspond to each customs district along the border with Mexico.

Figure 1 graphs the evolution of the real dollar value of total merchandise imports from Mexico between 1995 and 2015. Deflation of the nominal trade data is completed using the GDP deflator with 2009 as the base year (BEA 2017). Although cyclical in nature, merchandise imports increase substantially over the course of the sample period. Because more than 80% of imports from Mexico are shipped through the districts analyzed, at least some of these districts may contain trade clusters.

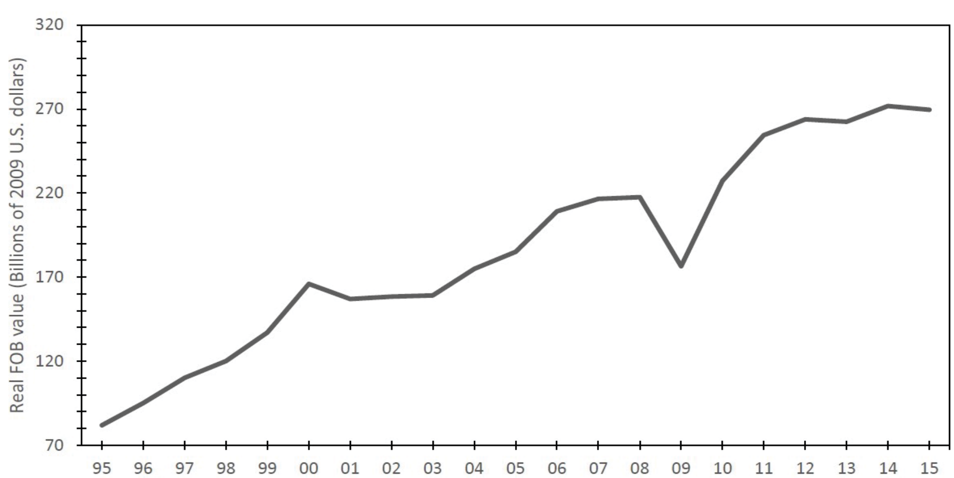

Figure 1: United States, Real Total Imports from Mexico (1995-2015)

This study attempts to analyze the extent to which transportation costs are influenced by trade clusters. Toward that end, it is necessary to determine whether a specific zone in the border region can be defined as a trade cluster. Also, a reliable measure for transportation costs is needed.

To quantify transportation costs, prior studies utilize the CIF / FOB ratio as a measure of transportation costs ((Limao and Venables 2001; Walke and Fullerton 2014; Globerman and Storer 2015). That ratio captures transportation costs using data on CIF (cost, insurance, and freight) and FOB (free on board) merchandise trade values. CIF represents the value of imports when they arrive at the importing country, which includes insurance and freight costs. FOB represents the value of imports reported by exporting countries. In other words, the FOB value is equal to the CIF value minus insurance and freight costs (De 2006). Both CIF and FOB values are reported by the United States International Trade Commission (USITC).

$$TC_{dt} = \frac{(CIF_{dt} - FOB_{dt})}{FOB_{dt}} * 100 \qquad (1)$$

Equation 1 illustrates how the transportation cost ratio is calculated. TC is the transportation cost ratio, subscript d stands for each district, while subscript t stands for time. It is not necessary to deflate the transportation cost ratio because it is not expressed in monetary units (Walke and Fullerton 2014). It is important to mention that the CIF value includes insurance and freight costs from the starting point or foreign country all the way to the final destination. It does not directly control for changes in distance and no attempt is made to do so. Instead, as done in a similar study that analyzes transport costs and trade clusters at the northern border, average shipping distances are assumed not to change during the sample period (Globerman and Storer 2015). Advances in data assembly may one day allow that question to be directly examined (Jarmin 2019).

Figure 2 provides graphs of the calculated transportation cost ratios. As can be observed, overall transportation costs have decreased since 1995. After 2001, transportation costs temporarily increased across all districts. Two recent studies indicate that increases in border security measures after 11 September 2001 impacted the CIF/FOB ratio (Globerman and Storer 2008; Walke and Fullerton 2014). Qualitative variables equal to zero from 1995 to 2000 and equal to one from 2001 to 2015 can help control for this effect.

As noted above, a trade cluster is defined as a geographical concentration where similar industries, or closely related industries, trade merchandise. Grubel-Lloyd and Herfindahl-Hirschman indexes are selected to operationalize this concept. The Grubel-Lloyd (GL) index is a widely utilized method for determining the degree of intra-industry trade (Grubel and Lloyd 1975; OECD 2002; Fullerton, Sawyer, and Sprinkle 2011). Equation 2 shows how that index is calculated.

$$GL_{id} = \left[\frac{(Exports_{id} + Imports_{id}) - \left| Exports_{id} - Imports_{id} \right|}{Exports_{id} + Imports_{id}} \right] = 1 - \left[\frac{\left| Exports_{id} - Imports_{id} \right|}{Exports_{id} + Imports_{id}} \right] \qquad (2)$$

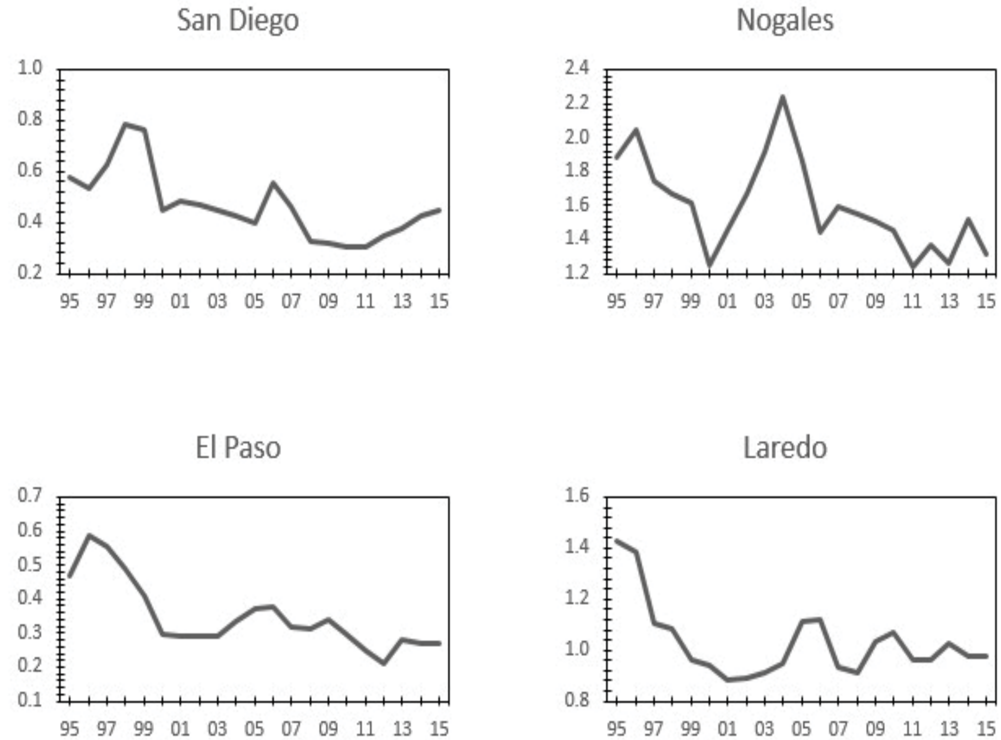

Figure 2: Customs District 100*(CIF – FOB)/FOB Ratios, 1995-2015

Intra-Industry trade occurs when a country simultaneously imports and exports similar goods, often at consecutive stages of production. A ***GL*** index is calculated for each industry ***(i)*** within each district ***(d)***. Each index is weighted by the share of total trade of each industry over total trade within the district. The indices provide information on the extent to which similar or closely related goods are traded within the districts. If the ***GL*** index is equal to one, this indicates that a country imports and exports similar products. In Equation 2, when exports equal imports, then ***GL*** equals one. At the other extreme, if a country does not export any of the goods that it imports, or vice versa, then ***GL*** equals zero. Thus, the ***GL*** index can take on values between zero and one (Van Marrewijk 2008). If intra-industry trade is present in a customs district, variations in transportation costs may result from just-in-time inventory strategies that cause companies to spend more on transportation as a means for reducing inventory costs (Globerman and Storer 2015).

The Herfindahl-Hirschman index ***(HH)*** is utilized by the Department of Justice of the United States for market concentration measurement in anti-trust analyses. It is typically calculated by squaring the market percentage share of each firm and then adding the numbers. The ***HH*** index approaches zero when the market is well distributed and approaches 10,000 points as the market becomes more concentrated (USDJ 2015). In this study, the ***HH*** index is calculated using decimals instead of percentage points. That forces the ***HH*** index to range from zero, when industries are well distributed, to one, when industries are highly concentrated. The 0 to 1 range matches that employed for the ***GL*** index above. Equation 3 shows how the ***HH*** index is calculated.

$$HH = X_1^2 + X_2^2 + X_3^2 + \cdots + X_n^2 \tag{3}$$

In Equation 3, X_n is the share, expressed in decimals, of each industry in total exports or total imports. As in Globerman and Storer (2015), an ***HH*** index is calculated for imports, with another index calculated for exports, and both are then added together. The ***GL*** and ***HH*** indices are calculated utilizing industry-level data. Industries are identified using the Harmonized Tariff Schedule ***(HTS)*** at the 6-digit level of specificity. The data are obtained from the United States International Trade Commission (USITC 2016). If the exports and imports of a customs district are concentrated among a small group of key industries, and those industries are very similar, that district can be characterized as having a trade cluster. The degree of concentration and similarity may help explain variations in merchandise trade transportation costs (Globerman and Storer 2015).

$$HHPORT = \sum_{i=1}^{n} X_n^2 \tag{4}$$

Equation 4 shows how the variable ***HHPORT*** is calculated. ***X*** is the share of total trade by ports and ***n*** is the number of ports. Since each custom district has several ports of entry, each port has a share of total trade in the customs district. The Bureau of Transportation Statistics (BTS 2017) publishes aggregate trade data for each port. Similar to ***HH6***, the trade shares are expressed using decimals, resulting in an ***HHPORT*** index that ranges in value between zero and one. As total trade within a custom district becomes more concentrated in a single port, the value of ***HH6*** approaches one. As total trade becomes more evenly distributed among the ports in a district, the value of ***HH6*** will approach zero.

Table 1 lists all of the variables included in the data sample. Along with the name assigned to each variable, Table 1 also provides definitions, units of measure, and data sources. A total of eleven variables are collected for each of the four customs districts in the sample. The time period analyzed is 1995-2015.

In addition to the industry ***(GL6)*** and trade concentration ***(HH6)*** variables, several other variables are also included in the sample. ***LEXIM*** is the natural logarithm of exports plus imports. It is used to quantify the effects of economies of scale on transportation costs. It also is expected to be correlated with backhaul shipments, further exerting a negative impact on transportation costs (Globerman and Storer 2015). ***TRUCK*** and ***PIPELINE*** are variables that measure the percentages of imports that enter each customs district by those modes of transportation. Trade data are reported by ports of entry and by mode of transportation, making it relatively easy to calculate those variables (BTS 2017).

Table 1: Variables Names and Definitions

Variable Name	Definition	Unit of Measure	Data Source
TC	(CIF – FOB) / FOB ratio transport cost measure.	Percent	USITC
GL6	Grubel-Lloyd intra-industry trade index using 6-digit Harmonized Tariff Schedule data for imports and exports.	Percent	USITC
HH6	Sum of the Herfindahl-Hirschman industry share of trade indices for exports and imports using 6-digit Harmonized Tariff Schedule data.	Percent	USITC
LEXIM	Natural logarithm of the sum of exports and imports through each customs district.	Natural Logarithm	USITC
HHPORT	Herfindahl-Hirschman index for port concentration.	Percent	BTS
TRUCK	Percent of total merchandise imports transported by cargo trucks.	Percent	BTS
PIPELINE	Percent of total merchandise imports transported by pipeline.	Percent	BTS
OPWEST	Interaction term for the product of the West Texas Intermediate oil price with the share of merchandise imports transported by truck or rail.	US$	BTS St. Louis Fed
TREND	Simple time trend variable.	1995 = 1 2015 = 21	BRMP
D2001	A binary variable for post-9/11 border inspection administrative changes.	1995 - 2000 = 0 2001 - 2015 = 1	BRMP
D2001TREND	An interaction term between the 9/11 dummy and time trend variables.	Discrete Numbers	BRMP

OPWEST is an interaction variable between the West Texas Intermediate oil price and the non-pipeline (truck and rail) merchandise transportation mode shares. Equation 5 shows how the ***OPWEST*** interaction variable is calculated. The share of trade by truck and railroad is multiplied by the oil price. This interaction term is designed to help quantify oil price change impacts on transportation costs by those transportation modes in each of the four customs districts (Globerman and Storer 2015).

$$OPWEST = \text{OilPrice} * (1 - \text{Pipeline}) \tag{5}$$

Table 2 reports summary statistics for all variables included in the sample. The ***TC*** transportation cost ratio has a mean of 0.86 across all four customs districts. Recalling how ***TC*** is calculated using Equation (1), that implies that insurance and freight charges equal approximately 0.86 percent of the total merchandise value in this sample. That is lower than what is documented for trade in general and probably reflects the close proximity of manufacturing facilities in northern Mexico to the border (Rodrigue 2017). The ***TC*** estimates are slightly asymmetric. More specifically, the observations for ***TC*** are right-skewed (positive). Compared to a Gaussian distribution, the ***TC*** data are also somewhat platykurtic.

Table 2: Summary Statistics

	TC	GL6	HH6	LEXIM	HHPORT	TRUCK	PIPELINE	OPWEST
Mean	0.861	0.254	0.064	10.683	0.666	0.856	0.000267	53.070
Median	0.835	0.240	0.057	10.023	0.617	0.866	1.20*10-6	48.642
Maximum	2.238	0.396	0.170	12.522	0.989	0.999	0.0024	99.670
Minimum	0.211	0.114	0.016	9.096	0.414	0.603	0.000	14.418
Std. Dev.	0.530	0.254	0.064	0.856	0.161	0.121	0.000581	30.240
Skewness	0.619	0.455	0.854	0.297	0.571	-0.219	2.333	0.281
Kurtosis	2.295	2.254	3.274	2.365	2.072	1.737	7.227	1.539

GL6 is right-skewed and slightly platykurtic. The observations for ***HH6*** are also positively skewed, but slightly leptokurtic. The data for ***LEXIM*** are distributed in a fairly symmetric manner about the mean. The port concentration variable, ***HHPORT***, has a mean of 0.66, reflecting fairly high degrees of trade flow concentrations among each of the customs districts. Observations ***PIPELINE*** are clustered near 0.0 because Mexico exports very little using this mode of transportation.

Equation 6 shows the implicit functional form that is utilized to model transportation costs.

$$TC = f(GL6, HH6, Other) \tag{6}$$

In Equation 6, ***TC*** is transportation costs as approximated by the *(CIF – FOB) / FOB* ratio. *GL6* is the Grubel-Lloyd index for industry similarity. ***HH6*** is the sum of the Herfindahl-Hirschman index for import concentration and the Herfindahl-Hirschman index for export concentration. Other variables listed in Table 1 are also utilized to control for additional factors that influence transportation costs. A fixed effects procedure is utilized that controls for time constant unobserved effects by employing a transformation that removes them before estimation (Wooldridge 2006).

$$TC_{dt} = \delta_0 + \delta_1 GL6_d + \delta_2 HH6_{dt} + \cdots + \delta_n Other_{dt} + a_d + e_{dt} \tag{7}$$

Equation 7 shows the model without fixed effects. Subscripts ***d*** and ***t*** stand for district and time, respectively. The term a_d represents the unobserved fixed effect for each district and e_{dt} is the error term. Averaging Equation 7 over time yields:

$$\overline{TC}_d = \delta_0 + \delta_1 \overline{GL6}_d + \delta_2 \overline{HH6}_d + \cdots + \delta_n \overline{Other}_d + a_d + \bar{e}_{dt} \tag{8}$$

Equation 8 employs the sample average of each variable for each customs district. It is not necessary to write the over-bar on a_d because it is constant over time. This also applies for the intercept term δ_0. The fixed effect transformation requires subtracting Equation 8 from Equation 7.

$$TC_{dt} - \overline{TC_d} = \delta_1(GL6_{dt} - \overline{GL6_d}) + \delta_2(HH6_{dt} - \overline{HH6_d}) + \cdots + \delta_n(Other_{dt} - \overline{Other_d}) + e_{dt} - \overline{e_d}$$

$$\ddot{TC}_{dt} = \delta_1 \ddot{GL6}_{dt} + \delta_2 \ddot{HH6}_{dt} + \cdots + \delta_n \ddot{Other}_{dt} + \ddot{e}_{dt} \qquad (9)$$

Equation 9 is the simplified form of the fixed effects specification, where $(\ddot{TC})_{dt} = TC_{dt} - (\overline{TC})_d$ and the same convention is used for the independent variables and the error term. This final equation is estimated using pooled ordinary least squares *(OLS)*. The constant terms, a_d and δ_0, are eliminated by the subtraction of Equation 8 from Equation 7. Parameter estimation results and implications are summarized in the next section.

ESTIMATION RESULTS

Table 3 summarizes estimation output for the fixed effects regression for transportation costs. Fixed effects modeling facilitates controlling for unobserved variables that are constant over time (Wooldridge 2006). As noted above, there is no universally accepted way to control for shipping distances so it is assumed that merchandise transport distances for each customs districts do not change, on average, over time. Clearly, distances traveled are different among those customs districts (Globerman and Storer 2015). Walke and Fullerton (2014) mention that the type of commodities traversing the United States - Mexico border are relatively similar over time, so this should be captured by the fixed effect estimates. Also, each district may differ in other respects (Cortright 2006) and these differences can potentially influence values for the dependent variable. The cross-section fixed effects show how these unobserved time-invariant factors affect transportation costs for each district.

Table 3: Fixed Effects Output for the TC = (CIF – FOB) * 100 / FOB Ratio

Regression with Driscoll-Kraay standard errors	Number of observations = 84
Method: Fixed-effects regression	Number of groups = 4
Group variable (i): DISTRICT	F(10, 3) = 73.48
Maximum lag = 2	Prob > F = 0.0023
Breusch-Pagan LM Chi-squared statistic = 10.66	within R-squared = 0.6304

TC	Coefficient	Drisc/Kraay Std. Err.	t	P > | t |	[95% Conf. Interval]	
CONSTANT	2.450	1.468	1.702	0.187	-2.173	7.172
GL6	-1.153	0.437	-2.640	0.078	-2.542	0.237
HH6	-1.605	0.495	-3.242	0.048	-3.179	-0.031
LEXIM	-0.193	0.124	-1.553	0.218	-0.588	0.202
HHPORT	-0.372	0.110	-3.381	0.043	-0.722	-0.022
TRUCK	1.382	0.524	2.639	0.078	-0.284	3.049
PIPELINE	-52.753	34.869	-1.512	0.228	-163.722	58.216
OPWEST	0.0001	0.0006	0.175	0.872	-0.0018	0.0020
TREND	-0.040	0.017	-2.425	0.094	-0.093	0.0126
D2001	-0.271	0.0552	-4.910	0.016	-0.447	-0.095
D2001TREND	0.053	0.011	4.796	0.017	0.018	0.087

Results in Table 3 are estimated employing the Driscoll and Kraay (1998) technique for computing robust standard errors by taking into account heteroscedasticity, autocorrelation, and cross-sectional dependence for panel datasets. Vogelsang (2012) provides an analysis of the validity of the robust standard errors proposed by Driscoll and Kraay (1998) in the context of the fixed effects estimator. Hoechle (2007) states that Driscoll and Kraay (1998) robust standard errors are more appropriate compared to other methods of robust standard error estimation when there is cross-sectional dependence. The Breusch and Pagan (1980) Lagrange multiplier (LM) test is used to examine the hypothesis that the residuals are independent across each cross-section. The Breusch and Pagan LM test works best when $T > N$ (De Hoyos and Sarafidis, 2006). The null hypothesis of cross-sectional independence is rejected at the one percent significance. Consequently, the Hoechle (2007) procedure is employed for all of the parameter estimates reported in Table 3.

Of course, employment of customs district data imposes an assumption that port fixed effects are jointly equal to zero. Until trade data by individual port can be obtained at the 6-digit HTS level, there is no way of testing whether that assumption is reasonable. It does seem plausible from the perspective that much of the trade volumes through each district tend to be concentrated at individual ports. Given that, any potential misspecification bias, at least at present, is limited. Given the new advances in data proliferation, it may eventually become possible to one day test that proposition (Jarmin 2019).

When estimating an equation with fixed effects, the time-demeaned transformation eliminates unobserved fixed effects along with the constant term (Wooldridge 2006). Although the data are demeaned, the estimation output includes a constant term. The constant coefficient of 2.450 in Table 3 represents the average of the fixed effects, in other words, the average of the intercepts of the four customs districts.

Table 4: Cross-Section Fixed Effects and Customs District Intercept Coefficients

Customs District	Cross-Section Fixed Effects	District Intercept
San Diego	-0.662	1.837
Nogales	0.661	3.161
El Paso	-0.549	1.951
Laredo	0.550	3.050

Column 2 of Table 4 reports the cross-section fixed effects. These effects represent the deviations of each cross-section intercept from the constant coefficient in Table 3. These estimates indicate that San Diego and El Paso, the largest urban economies in the sample, observe the lowest transport costs. Given the size of these metropolitan economies, plus long business histories in merchandise trade, economies of agglomeration may be embodied by the estimates shown in Table 4 (Venables 2007).

Column 3 of Table 4 reports the calculated intercept term for each district. The district intercepts allow measuring the effect of the time-constant unobserved variables on the transportation cost ratios for each district, while controlling for the observed independent variables. For example, transportation costs for the El Paso district are estimated to equal 1.95 percent of the value of imports after accounting for the impacts of the other independent variables in Table 3. The Laredo and Nogales customs districts exhibit the highest transportation cost ratios, 3.05 and 3.16 percentage points, respectively.

The higher transportation cost ratios in those districts do not appear to be due to the types of merchandise that are imported through those ports. Table 5 reports the top three ***HTS*** chapters of imports for each district for six years from 1990 through 2015. All four customs districts process relatively high volumes of transportation equipment and electronic equipment. Although Nogales processes high volumes of fruit and vegetable imports, the goods mix imported through Laredo is very similar to that of El Paso. Finally, with a calculated intercept of 2.32 percentage points, the San Diego district has the lowest transportation cost ratio, probably reflecting shorter average distances for shipments originating from Tijuana and Mexicali.

The intercepts in Table 4 differ in magnitude from the northern border coefficients obtained by Globerman and Storer (2015). In this study, the average of district intercepts is 2.99 percentage points. The corresponding average for the border between the United States and Canada is 10.27 percentage points. Buffalo and St. Albans are the districts with the highest and lowest transportation costs due to fixed effects, with estimated intercepts of 10.99 and 9.40 percentage points, respectively. The time-invariant factors on the southern border of the United States have relatively lower impacts on transportation costs than is the case on the northern border. The mix of goods imported may influence the difference in transportation cost ratios for the two borders. Table 6 shows that Canada exports large volumes of energy products to the United States.

Table 5: Top 3 United States Imports from Mexico by Customs District

	San Diego		Nogales		El Paso		Laredo	
	HTS	%	HTS	%	HTS	%	HTS	%
	85	37%	87	28%	85	56%	85	25%
1990	84	10%	7	20%	98	7%	87	22%
	90	6%	85	18%	84	6%	84	12%
	85	39%	87	29%	85	53%	87	27%
1995	84	12%	85	22%	84	9%	85	21%
	87	7%	7	12%	90	8%	84	12%
	85	40%	85	34%	85	47%	87	32%
2000	84	16%	87	22%	84	13%	85	20%
	87	6%	7	8%	90	7%	84	14%
	85	44%	85	29%	85	40%	87	26%
2005	84	10%	87	14%	84	20%	85	20%
	87	7%	7	12%	87	9%	84	16%
	85	49%	87	35%	84	35%	87	27%
2010	90	9%	85	16%	85	31%	85	21%
	87	8%	7	13%	87	11%	84	16%
	85	43%	87	33%	84	36%	87	32%
2015	87	14%	85	18%	85	24%	85	18%
	90	9%	7	10%	87	15%	84	16%

Harmonized Tariff Schedule Chapters:
7: Edible vegetables and certain roots and tubers
84: Machinery and mechanical appliances; nuclear reactors; boilers
85: Electrical machinery and equipment; television recorders/reproducers; sound recorders/reproducers
87: Vehicles, other than railway or tramway rolling stock, and parts and accessories thereof
90: Optical, photographic, cinematographic, measuring, checking, precision, medical/surgical apparatuses
98: Special classification provisions: not either specified or included

Source: Table from Walke and Fullerton (2014), data from USITC (2016)

The Grubel-Lloyd index ***(GL6)*** for intra-industry trade is calculated using the Harmonized Tariff Schedule ***(HTS)*** at the 6-digit level of classification for exports and imports. The parameter estimate is negative, indicating that transportation costs decline as the similarity of goods being traded increases (Table 3). The coefficient suggests that, when the ***GL6*** index increases by one unit, transportation costs will decrease by 1.17 units of the ***(CIF – FOB) / FOB*** ratio. Greater intra-industry trade probably increases the likelihood of obtaining backhaul transport contracts. Industries engaged in intra-industry trade also tend to locate in cities closer to the border and, generally, ship freight over smaller distances. In the case of the Canada-United States border, the ***GL6*** regression coefficient is positive. The latter finding is attributed to the prominence of just-in-time inventory management techniques that place a premium on timely delivery and may, consequently, reduce backhaul opportunities and/or volumes (Globerman and Storer 2015).

Table 6: Top 3 United States Imports from Mexico and Canada

	Mexico		Canada	
	HTS	%	HTS	%
1990	85	33.23%	87	33.54%
	87	14.68%	84	8.82%
	84	9.43%	27	7.21%
1995	85	31.40%	87	32.38%
	87	18.11%	84	8.60%
	84	10.82%	27	6.60%
2000	85	30.09%	87	28.94%
	87	21.87%	27	10.21%
	84	13.43%	84	8.05%
2005	85	28.75%	87	25.73%
	87	18.53%	27	17.30%
	84	15.22%	84	7.42%
2010	85	27.14%	87	21.96%
	87	21.16%	27	18.92%
	84	18.22%	84	7.31%
2015	87	26.21%	87	24.22%
	85	23.14%	27	12.48%
	84	18.19%	84	7.85%

Harmonized Tariff Schedule Chapters:

27: Mineral fuels, mineral oils, and distillation products; bituminous substances; mineral waxes

84: Machinery and mechanical appliances; nuclear reactors; boilers

85: Electrical machinery/equipment; tv recorders/reproducers; sound recorders/reproducers

87: Vehicles, other than railway or tramway rolling stock, plus parts and accessories thereof

Source: Data from USITC (2016)

Herfindahl-Hirschman sub-indices are calculated for exports and imports using the Harmonized Tariff Schedule *(HTS)* at the 6-digit level of classification. ***HH6*** is the sum of those two sub-indices. The ***HH6*** coefficient in Table 3 suggests that a one unit increase in the concentration of imports or exports in particular goods diminishes costs related to movements of merchandise from one country to another by 1.17 percentage points of the *(CIF – FOB / FOB)* dependent variable ratio. These effects are likely attributable to the increasing probability of finding backhaul opportunities. Also potentially contributing to this is greater specialization among border personnel at individual customs district ***POE*** in handling shipment and customs requirements for those particular goods categories. The coefficient estimate does not quite satisfy the standard significance criterion, but the magnitude is economically significant. In contrast to the negative coefficient reported in Table

3, Globerman and Storer (2015) find that ***HH6*** positively impacts transportation costs across the northern border. That study indicates that this may be due to extremely high degrees of specialization in certain industries that effectively preclude finding backhaul shipments.

The parameter estimate for the total trade variable (***LEXIM***, the logarithm of the sum of exports and imports) is negative and significant in Table 3. This coefficient indicates that a one percent increase in total trade results in a reduction of 0.23 percentage points in the transportation cost ratio for merchandise arriving at the international boundary between the two countries. This negative relationship can be attributed to higher probabilities of finding backhaul shipments due to greater volumes of bilateral trade within a customs district (Globerman and Storer 2015). The total trade variable also helps to identify the effect of economies of scale on transportation costs. One reason that countries trade, of course, is to take advantage of economies of scale (Krugman, Obstfeld, and Melitz 2012). The same effect is reported for the northern border with Canada, where increases in the total trade variable also reduce transportation costs, but to a greater extent than indicated by Table 3.

The ***HHPort*** variable is designed to measure the concentration of merchandise trade flows among ports of entry in a customs district. Higher values of this index mean that more of the trade is concentrated among a few ports. Lower values mean that trade is more evenly distributed among the various ports. The coefficient for this variable in Table 3 is negative and statistically significant. It indicates that, as the Herfindahl-Hirschman port concentration index increases by one unit, the transportation cost $(CIF - FOB) / FOB$ ratio decreases by -0.4985 percentage. Similar to what Globerman and Storer (2015) report for the northern border with Canada, the magnitude of the ***HHPort*** parameter is economically significant as well as negative.

Table 7 reports the percentage of district-wide trade flows that go through each port. The ports of Otay Mesa, Nogales, El Paso, and Laredo handle the highest individual percentages of total trade in each respective district (BTS 2017). Because those ports are more intensively utilized, customs officers stationed there tend to be more knowledgeable about import procedures and the kinds of products that are imported through these locations. That helps make delays less common and probably reduces transportation costs. Furthermore, the likelihood of landing backhaul contracts may also be higher when trade volumes are concentrated in a few heavily transited ports (Globerman and Storer 2015).

Table 7: Average Percentage of Total District Trade through each Port (1995-2015)

District		Ports				
	San Diego %	San Ysidro 2.82	Otay Mesa 67.59	Tecate 2.37	Calexico 25.81	Others 1.41
	Nogales %	San Luis 5.75	Nogales 86.70	Douglas 6.82	Others 0.73	---
	El Paso %	Santa Teresa 12.98	El Paso 86.27	Others 0.75	---	---
	Laredo %	Eagle Pass 8.35	Laredo 69.96	Hidalgo 11.72	Brownsville 7.54	Others 2.43

Source: Bureau of Transportation Statistics (BTS 2017)

TRUCK, ***PIPELINE***, and ***OPWEST*** are utilized to control for other factors that might affect transportation costs. ***TRUCK*** is a measure of the percentage of merchandise imports that travel by truck. The coefficient estimate for this regressor in Table 3 indicates that, when the share of trade shipped by truck rises by one percentage point, the ***(CIF – FOB) / FOB*** ratio is expected to increase by 1.19 percentage points. This result confirms the effect hypothesized for the northern border in Globerman and Storer (2015), but the computed t-statistic does not surpass the 5-percent significance threshold.

PIPELINE measures the share of merchandise imports that traverse the border via pipeline. The estimated coefficient in Table 3 is negative, implying that trade related transportation costs decline as pipeline shipments increase. More precisely, the estimated coefficient suggests that, when this variable increases by one percentage point, the transportation cost ***(CIF – FOB) / FOB*** ratio decreases by slightly more than 12 percentage points. The coefficient magnitude for this variable may be unrealistically large. It also fails to satisfy the standard significance criterion. Data from the Bureau of Transportation Statistics indicate that imports into the United States by pipeline are almost null at southern border (BTS 2017). For example, the percentage of imports by pipeline through the El Paso district is zero for each year in the sample. Given the limited volume of imports by pipeline at the southern border, the size of the pipeline coefficient should be interpreted with caution. It does suggest, however, that the recent investments to increase energy pipeline export capacity from the United States to northern Mexico will reduce overall trade related transport costs (Proctor 2019; ICVS 2019).

That is very different from what has been reported for the United States border with Canada. Across that boundary, a negative and significant relationship is estimated for between pipeline imports and transportation costs (Globerman and Storer 2015). Of course, pipeline imports from Canada are more prevalent than pipeline imports from Mexico. In Table 6, mineral fuel and mineral oils are consistently among the top three categories of merchandise imports from Canada throughout the entire sample period.

OPWEST is an interaction term calculated by the product of the West Texas Intermediate oil price and the share of imports transported using modes of transportation other than pipelines. This interaction term helps to measure the impact on transportation costs by trucks and rail when there are changes in oil prices. As expected, the regression parameter indicates that a positive relationship exists between the oil price variable and the dependent variable (Table 3). This coefficient has a magnitude of 0.0011. In economic terms, the total dollar equivalent of a one unit increase in ***OPWEST*** is a transportation cost increase, by truck and rail, of only $401,582 USD across all four customs districts. Not surprisingly, the coefficient is not statistically distinguishable from zero. In all likelihood, the fixed costs of cargo trucks and rail dominate those of the marginal fuel costs, represented in this sample by the West Texas Intermediate oil price. In contrast, for the Canada-United States border, the same interaction variable exerts a stronger effect on the transportation cost ratio (Globerman and Storer 2015).

Both Globerman and Storer (2008) and Walke and Fullerton (2014) provide evidence that transportation costs increased significantly after the terrorist attacks in 2001 at the southern and northern borders of the United States, respectively. In order to assess potential impacts of this event, a dummy variable, a trend variable, and an interaction term are employed. Table 3 reports the estimated output allowing for 9/11 effects. In most cases, the explanatory variables have the same signs and magnitudes as in Table 3 and the interpretations are the same.

In Table 3, the ***TREND*** coefficient is negative as hypothesized. This inverse relationship is broadly discernible in the ***(CIF – FOB)*** / ***FOB*** ratio graphs for each customs district in Figure 2. The dummy variable ***(D2001)*** also has a negative parameter estimate that is statistically significant at the 5-percent level. This coefficient captures the difference between intercepts in the periods before and after 2001. Because transportation costs declined prior to 2001, the intercept for the 2001-2015 period is lower (Walke and Fullerton 2014).

In accordance with Globerman and Storer (2008) for the northern border with Canada, as well as Walke and Fullerton (2014) for the southern border with Mexico, an interaction term between the dummy and the trend variables ***(D2001TREND)*** is also employed. The parameter estimate for this interaction variable is consistent with what is documented in the earlier studies, as it is both positive and statistically significant. The visible increases in the ***(CIF – FOB*** / ***FOB)*** ratio subsequent to the imposition of the post-9/11 security measures in each customs district are, thus, corroborated by the results reported in Table 3.

CONCLUSION

This study analyzes the extent to which transportation costs are influenced by trade clusters at different locations along the border between the United States and Mexico. Sample data are collected for a two-decade period from 1995 through 2015. From west to east, the southern United States border region has four customs districts: San Diego, Nogales, El Paso, and Laredo. Transportation cost ratios are calculated for each district as ***TC = (CIF – FOB)*** / ***FOB***. Grubel-Lloyd indices for intra-industry trade similarity and Herfindahl-Hirschman indices for industry concentration are calculated and employed as variables that identify trade clusters.

Parameter estimation of the two equations employs a fixed effect procedure that calculates robust standard errors by allowing for heteroscedasticity, autocorrelation, and cross-sectional dependence. The first equation includes the trade cluster variables and a set of control variables. The second model also controls for potential 9/11 effects on transportation costs. Empirical results indicate that the districts of Laredo and Nogales exhibit the highest transportation cost ratios among the four districts due to time-invariant factors. While the types of merchandise imported through each district are similar, other fixed factors such as distance that affect the documented transport costs.

Statistically significant impacts between trade cluster variables and transportation costs are confirmed by the regression analysis. Higher levels of intra-industry trade are associated with lower transportation costs, albeit with some degree of uncertainty. Higher levels of trade concentration are also found to reduce transportation costs in statistically reliable manners. The magnitudes of the ***GL6*** and ***HH6*** coefficients are also economically significant. Controlling for the effects of 9/11 terrorist attacks on administrative and inspection practices at the ports of entry also improves empirical outcomes.

The fixed effect results indicate that the time-invariant components of transportation costs are higher at northern border ports than at the southern ports of entry examined in this study. The impacts of trade similarity and industry concentration on southern border transportation costs are also found to be opposite of the effects documented for the border with Canada. For the border with Mexico, negative coefficients are tallied for both ***GL6*** and ***HH6***, perhaps as a consequence of greater backhaul opportunities. A helpful step in clarifying the latter discrepancy might be provided by the acquisition of shipping distance data to augment the inclusion of transportation cost ratios and trade clusters indices for the various ports and port districts along both borders.

Implementation of the North American Free Trade Agreement led to numerous infrastructure investments that helped lower merchandise trade transport costs. That possibility also exists should the United States – Mexico – Canada Agreement be implemented in 2020 (or later). While the new trilateral agreement does contain administrative constraints that may cause inspection delays and disputes, new technologies and streamlined inspection procedures designed to expedite trade will also be introduced. The net impacts of these developments cannot, yet, be assessed, but should be examined at some future point once data become available.

REFERENCES

Anderson, B. 2012. The Border and the Ontario Economy. Windsor, ON: University of Windsor Cross-Border Transportation Centre.

Anderson, J.E., and E. van Wincoop. 2004. "Trade Costs." Journal of Economic Literature 42 (3): 691-751.

Baptista, R., and P. Swann. 1998. "Do Firms in Cluster Innovate More?" Research Policy 27 (5): 691-751.

Behar, A., and A.J. Venables. 2011. "Transport Costs and International Trade." Chapter 5 in A Handbook of Transport Economics. Cheltenham, UK: Edward Elgar Publishing.

Breusch, T., and A.R. Pagan. 1980. "The Lagrange Multiplier Test and its Application to Model Specification in Econometrics." Review of Economic Studies 47 (1): 239-253.

BEA. 2017. Implicit Price Deflators for Gross Domestic Product. Washington, DC: United States Bureau of Economic Analysis.

BTS. 2017. North American Transborder Freight Data. Washington, DC: United States Bureau of Transportation Statistics.

Cortright, J. 2006. Making Sense of Clusters: Regional Competitiveness and Economic Development. Washington, DC: Brookings Institution.

Das, S., and S. Pohit. 2006. "Qualifying Transport, Regulatory and other Costs of Indian Overland Exports to Bangladesh." World Economy 29 (9): 1227-1242.

De, P. 2006. Why Trade Costs Matter? Bangkok, TH: UNESCAP.

De Hoyos, R.E., and V. Sarafidis. 2006. "Testing for Cross-Sectional Dependence in Panel-Data Models." Stata Journal 6 (4): 482-496.

Delgado, M., M.E. Porter, and S. Stern. 2010. "Clusters and Entrepreneurship," Journal of Economic Geography 10 (4): 495-518.

Delgado, M., M.E. Porter, and S. Stern. 2014. "Clusters, Convergence and Economic Performance." Research Policy 43 (10): 1785-1799.

Delgado, M., M.E. Porter, and S. Stern. 2016. "Defining Clusters of Related Industries," Journal of Economic Geography 16 (1): 1-38.

Driscoll, J.C., and A.C. Kraay. 1998. "Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data," Review of Economics and Statistics 80: 549-560.

Fullerton, T.M., Jr. 2007. "Empirical Evidence Regarding 9/11 Impacts on The Borderplex Economy." Regional & Sectoral Economic Studies 7 (2): 51-64.

REFERENCES (CONT.)

Fullerton, T.M., Jr., W.C. Sawyer, and R.L. Sprinkle. 2011. "Intra-Industry Trade in Latin America and the Caribbean." International Trade Journal 25 (1): 74-111.

Globerman, S., and P. Storer. 2008. The Impacts of 9/11 on Canada-U.S. Trade. Toronto, ON: University of Toronto Press.

Globerman, S., and P. Storer. 2015. "Transportation Costs and Trade Clusters: Some Empirical Evidence from U.S. Custom Districts." Research in Transportation Business & Management 16: 67-73.

Grubel, H.G., and P.J. Lloyd. 1975. Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products. London, UK: Macmillan.

Hanson, G.H. 2001. "U.S.-Mexico Integration and Regional Economies: Evidence from Border-City Pairs." Journal of Urban Economics 50 (2): 259-287.

Hays, F.H., and S.G. Ward. 2011. "Understanding Market Concentration: Internet-Based Applications from the Banking Industry," Journal of Instructional Pedagogies 5: 101-115.

Hoechle, D. 2007. "Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence." Stata Journal 7 (3): 281-312.

ICVS. 2019. "NuStar using new Pipelines to move Fuel into Northern Mexico." Bulk Transporter (9 September).

Jarmin, R.S. 2019. "Evolving measurement for an Evolving Economy." Journal of Economic Perspectives 33 (1): 165-183.

Jones, L.L., T. Ozuna, Jr., and M. Wright. 1991. The U.S.-Mexico Free Trade Agreement: Economic Impacts on the Border Region. College Station, TX: Texas Agricultural Market Research Center.

Krueger, A.O. 2000. "NAFTA's Effects: A Preliminary Assessment." World Economy 23 (6): 761-775.

Krugman, P.R., M. Obstfeld, and M.J. Melitz. 2012. International Economics: Theory & Policy, Boston, MA: Pearson.

Limao, N., and A.J. Venables. 2001. "Infrastructure Geographical Disadvantage, Transport Costs, and Trade." World Bank Economic Review 15 (3): 451-479.

OECD. 2002. "Intra-Industry and Intra-Firm Trade and the Internationalization of Production." OECD Economic Outlook 1 (12): 309-320.

Peach, J.T., and R.V. Adkisson. 2000. "NAFTA and Economic Activity along the U.S.-Mexico Border." Journal of Economic Issues 34 (2): 481-489.

Porter, M.E. 2003. "The Economic Performance of Regions." Regional Studies 37 (6&7): 549-578.

Proctor, D. 2019. "Pipeline Deal means more U.S. Natural Gas for Mexico Power Plants." Power (28 August).

Rodrigue, J. 2017. The Geography of Transport Systems. New York, NY: Routledge.

USDJ. 2015. Herfindahl-Hirschman Index. Washington, DC: United States Department of Justice.

USITC. 2016. Interactive Tariff and Trade Dataweb, Washington, DC: United States International Trade Commission.

Van Marrewijk, C. 2008. "Intra-Industry Trade," in Princeton Encyclopedia of the World Economy. Princeton, NJ: Princeton University Press.

Venables, A.J. 2007. "Evaluating Urban Transport Improvements." Journal of Transport Economics and Policy 41 (2): 173-188.

Vogelsang, T.J. 2012. "Heteroskedasticity, Autocorrelation, and Spatial Correlation Robust Inference in Linear Panel Models with Fixed-Effects." Journal of Econometrics 166 (2): 303-319.

Walke, A.G., and T.M. Fullerton, Jr. 2014. "Freight Transportation Costs and the Thickening of the U.S.–Mexico Border." Applied Economics 46 (11): 1248-1258.

Wooldridge, J.M. 2006. Introductory Econometrics a Modern Approach. Cincinnati, OH: Thomson South-Western.

Appendix A: Southern Border Customs Districts and Ports

District	Port
Laredo	Brownsville, TX
	Valley International Airport, Harlingen, TX
	Edinburg User Fee Airport, TX
	Progreso, TX
	Hidalgo/Pharr, TX
	Rio Grande City, TX
	Roma, TX
	Laredo, TX
	Eagle Pass, TX
	Del Rio, TX
El Paso	Presidio, TX
	Fabens, TX
	El Paso International Airport, TX
	El Paso, TX
	Santa Teresa Airport, NM
	Santa Teresa, NM
	Columbus, NM
	Albuquerque, NM
Nogales	Douglas, AZ
	Naco, AZ
	Nogales, AZ
	Tucson, AZ
	Saasabe, AZ
	Lukeville, AZ
	San Luis, AZ
	Phoenix, AZ
San Diego	Andrade, CA
	Calexico East, CA
	Calexico, CA
	Tecate, CA
	Otay Mesa Station, CA
	San Ysidro, CA
	San Diego, CA

Appendix B: Historical Data

DIST	YEAR	TC	TRUCK	PIPELINE	LEXIM	GL6
El Paso	1995	0.4668	0.9805	0.0000	9.90	0.2623
El Paso	1996	0.5843	0.9806	0.0000	10.02	0.2691
El Paso	1997	0.5572	0.9837	0.0029	10.11	0.2687
El Paso	1998	0.4899	0.9797	0.0027	10.28	0.2324
El Paso	1999	0.4068	0.9860	0.0045	10.41	0.2179
El Paso	2000	0.2971	0.9578	0.0055	10.62	0.2192
El Paso	2001	0.2915	0.9551	0.0028	10.57	0.2245
El Paso	2002	0.2901	0.9437	0.0028	10.59	0.2308
El Paso	2003	0.2914	0.9359	0.0023	10.61	0.2192
El Paso	2004	0.3331	0.9328	0.0006	10.70	0.2132
El Paso	2005	0.3700	0.9233	0.0090	10.71	0.2500
El Paso	2006	0.3768	0.9075	0.0117	10.79	0.2720
El Paso	2007	0.3198	0.8920	0.0071	10.84	0.2549
El Paso	2008	0.3136	0.8840	0.0102	10.82	0.2637
El Paso	2009	0.3402	0.9046	0.0025	10.76	0.2334
El Paso	2010	0.2982	0.9012	0.0134	11.15	0.2163
El Paso	2011	0.2496	0.8945	0.0231	11.27	0.2138
El Paso	2012	0.2110	0.8872	0.0161	11.36	0.2303
El Paso	2013	0.2786	0.8919	0.0113	11.36	0.2292
El Paso	2014	0.2690	0.8803	0.0142	11.37	0.2250
El Paso	2015	0.2706	0.8883	0.0083	11.43	0.2288
Laredo	1995	1.4259	0.7760	0.0001	10.79	0.2811
Laredo	1996	1.3823	0.7562	0.0001	11.02	0.2926
Laredo	1997	1.1056	0.7931	0.0000	11.25	0.3354
Laredo	1998	1.0857	0.8154	0.0001	11.33	0.3582
Laredo	1999	0.9643	0.8101	0.0000	11.46	0.3428
Laredo	2000	0.9393	0.7678	0.0012	11.69	0.3776
Laredo	2001	0.8813	0.7487	0.0022	11.63	0.3897
Laredo	2002	0.8875	0.7569	0.0055	11.62	0.3765
Laredo	2003	0.9085	0.7594	0.0008	11.63	0.3613
Laredo	2004	0.9493	0.7697	0.0007	11.75	0.3701
Laredo	2005	1.1137	0.7684	0.0017	11.81	0.3703
Laredo	2006	1.1169	0.7800	0.0020	11.93	0.3531
Laredo	2007	0.9305	0.7737	0.0050	11.99	0.3516

Appendix B: Historical Data (cont.)

DIST	YEAR	TC	TRUCK	PIPELINE	LEXIM	GL6
Laredo	2008	0.9082	0.7821	0.0072	12.03	0.3730
Laredo	2009	1.0328	0.8171	0.0051	11.85	0.3647
Laredo	2010	1.0686	0.7946	0.0085	12.08	0.3808
Laredo	2011	0.9635	0.7868	0.0108	12.24	0.3857
Laredo	2012	0.9604	0.7802	0.0111	12.34	0.3945
Laredo	2013	1.0259	0.7832	0.0139	12.40	0.3962
Laredo	2014	0.9750	0.7859	0.0160	12.50	0.3929
Laredo	2015	0.9758	0.7900	0.0121	12.52	0.3933
Nogales	1995	1.8852	0.8073	0.0000	9.10	0.1139
Nogales	1996	2.0454	0.8427	0.0000	9.10	0.1581
Nogales	1997	1.7458	0.8223	0.0000	9.29	0.1656
Nogales	1998	1.6697	0.8106	0.0000	9.44	0.1618
Nogales	1999	1.6143	0.8476	0.0004	9.47	0.1605
Nogales	2000	1.2482	0.8397	0.0000	9.70	0.1885
Nogales	2001	1.4549	0.8243	0.0006	9.59	0.1800
Nogales	2002	1.6668	0.8355	0.0002	9.43	0.1718
Nogales	2003	1.9149	0.8797	0.0000	9.40	0.1737
Nogales	2004	2.2377	0.8888	0.0000	9.55	0.1823
Nogales	2005	1.8584	0.8694	0.0000	9.71	0.1787
Nogales	2006	1.4458	0.7307	0.0000	9.97	0.1460
Nogales	2007	1.5982	0.7659	0.0000	9.96	0.1570
Nogales	2008	1.5472	0.7226	0.0001	9.98	0.1497
Nogales	2009	1.5021	0.7219	0.0001	9.83	0.1573
Nogales	2010	1.4520	0.6930	0.0059	10.03	0.1737
Nogales	2011	1.2395	0.6874	0.0072	10.15	0.1699
Nogales	2012	1.3717	0.7351	0.0080	10.22	0.1781
Nogales	2013	1.2627	0.6383	0.0069	10.37	0.1436
Nogales	2014	1.5137	0.6609	0.0077	10.33	0.1541
Nogales	2015	1.3098	0.6614	0.0055	10.36	0.1608
San Diego	1995	0.5737	0.9925	0.0002	9.52	.2383
San Diego	1996	0.5323	0.9926	0.0001	9.73	0.2382
San Diego	1997	0.6248	0.9894	0.0001	9.89	0.2600
San Diego	1998	0.7877	0.9953	0.0001	10.01	0.2513
San Diego	1999	0.7660	0.9944	0.0001	10.12	0.2698

DIST	YEAR	TC	TRUCK	PIPELINE	LEXIM	GL6
San Diego	2000	0.4502	0.9946	0.0001	10.26	0.2700
San Diego	2001	0.4837	0.9923	0.0001	10.24	0.2663
San Diego	2002	0.4662	0.9935	0.0000	10.31	0.2605
San Diego	2003	0.4460	0.9946	0.0000	10.30	0.2672
San Diego	2004	0.4261	0.9909	0.0000	10.41	0.2558
San Diego	2005	0.3999	0.9911	0.0000	10.51	0.2552
San Diego	2006	0.5586	0.9916	0.0000	10.65	0.2376
San Diego	2007	0.4596	0.9882	0.0000	10.70	0.2199
San Diego	2008	0.3252	0.9869	0.0011	10.70	0.2229
San Diego	2009	0.3171	0.9853	0.0068	10.55	0.2243
San Diego	2010	0.3027	0.9870	0.0030	10.66	0.2385
San Diego	2011	0.3040	0.9826	0.0052	10.74	0.2416
San Diego	2012	0.3452	0.9830	0.0040	10.79	0.2496
San Diego	2013	0.3772	0.9866	0.0048	10.83	0.2600
San Diego	2014	0.4270	0.9864	0.0058	10.92	0.2697
San Diego	2015	0.4445	0.9926	0.0024	11.01	0.2605

DIST	YEAR	HH6	HHPORT	OPWEST	TREND	D2001
El Paso	1995	0.0557	0.9855	18.43	1	0
El Paso	1996	0.0568	0.9888	22.12	2	0
El Paso	1997	0.0535	0.9439	20.55	3	0
El Paso	1998	0.0568	0.9494	14.38	4	0
El Paso	1999	0.0454	0.9402	19.25	5	0
El Paso	2000	0.0440	0.9379	30.21	6	0
El Paso	2001	0.0435	0.9490	25.91	7	1
El Paso	2002	0.0480	0.9467	26.11	8	1
El Paso	2003	0.0703	0.9323	31.01	9	1
El Paso	2004	0.0646	0.9267	41.49	10	1
El Paso	2005	0.0523	0.9291	56.13	11	1
El Paso	2006	0.0511	0.9326	65.27	12	1
El Paso	2007	0.0405	0.9274	71.83	13	1
El Paso	2008	0.0488	0.9273	98.66	14	1
El Paso	2009	0.0717	0.8152	61.79	15	1
El Paso	2010	0.0835	0.6800	78.41	16	1

Appendix B: Historical Data (cont.)

DIST	YEAR	HH6	HHPORT	OPWEST	TREND	D2001
El Paso	2011	0.1061	0.6375	92.69	17	1
El Paso	2012	0.1072	0.6319	92.54	18	1
El Paso	2013	0.1145	0.6432	96.87	19	1
El Paso	2014	0.1140	0.6427	91.85	20	1
El Paso	2015	0.1297	0.6235	48.26	21	1
Laredo	1995	0.0285	0.4141	18.43	1	0
Laredo	1996	0.0344	0.4417	22.12	2	0
Laredo	1997	0.0274	0.4647	20.61	3	0
Laredo	1998	0.0225	0.4768	14.42	4	0
Laredo	1999	0.0239	0.4935	19.34	5	0
Laredo	2000	0.0296	0.5245	30.34	6	0
Laredo	2001	0.0295	0.5261	25.92	7	1
Laredo	2002	0.0262	0.5308	26.04	8	1
Laredo	2003	0.0229	0.5212	31.05	9	1
Laredo	2004	0.0203	0.5300	41.48	10	1
Laredo	2005	0.0177	0.5143	56.54	11	1
Laredo	2006	0.0170	0.5010	65.92	12	1
Laredo	2007	0.0164	0.4977	71.98	13	1
Laredo	2008	0.0163	0.5086	98.95	14	1
Laredo	2009	0.0181	0.4981	61.63	15	1
Laredo	2010	0.0178	0.5017	78.80	16	1
Laredo	2011	0.0177	0.5184	93.86	17	1
Laredo	2012	0.0181	0.5328	93.01	18	1
Laredo	2013	0.0184	0.5399	96.62	19	1
Laredo	2014	0.0190	0.5382	91.68	20	1
Laredo	2015	0.0199	0.5488	48.07	21	1
Nogales	1995	0.0981	0.6859	18.43	1	0
Nogales	1996	0.0688	0.6904	22.12	2	0
Nogales	1997	0.0723	0.6970	20.61	3	0
Nogales	1998	0.0665	0.6962	14.42	4	0
Nogales	1999	0.0574	0.6874	19.33	5	0
Nogales	2000	0.0674	0.7281	30.38	6	0
Nogales	2001	0.0600	0.7500	25.97	7	1
Nogales	2002	0.0496	0.7663	26.18	8	1

DIST	YEAR	HH6	HHPORT	OPWEST	TREND	D2001
Nogales	2003	0.0369	0.7634	31.08	9	1
Nogales	2004	0.0340	0.7615	41.51	10	1
Nogales	2005	0.0448	0.7532	56.64	11	1
Nogales	2006	0.1096	0.7987	66.05	12	1
Nogales	2007	0.0731	0.7747	72.34	13	1
Nogales	2008	0.0965	0.7959	99.66	14	1
Nogales	2009	0.0855	0.7886	61.95	15	1
Nogales	2010	0.1057	0.7919	79.01	16	1
Nogales	2011	0.0935	0.7640	94.20	17	1
Nogales	2012	0.0769	0.7547	93.29	18	1
Nogales	2013	0.1365	0.7680	97.30	19	1
Nogales	2014	0.1021	0.7629	92.45	20	1
Nogales	2015	0.1161	0.7713	48.39	21	1
San Diego	1995	0.0427	0.5524	18.43	1	0
San Diego	1996	0.0432	0.5373	22.12	2	0
San Diego	1997	0.0416	0.4520	20.61	3	0
San Diego	1998	0.0438	0.5349	14.42	4	0
San Diego	1999	0.0447	0.5107	19.34	5	0
San Diego	2000	0.0528	0.5355	30.38	6	0
San Diego	2001	0.0609	0.5622	25.98	7	1
San Diego	2002	0.0644	0.5468	26.18	8	1
San Diego	2003	0.0609	0.5344	31.08	9	1
San Diego	2004	0.0685	0.5363	41.51	10	1
San Diego	2005	0.0758	0.5374	56.64	11	1
San Diego	2006	0.1218	0.5530	66.05	12	1
San Diego	2007	0.1704	0.5618	72.34	13	1
San Diego	2008	0.1700	0.5778	99.56	14	1
San Diego	2009	0.1637	0.6111	61.53	15	1
San Diego	2010	0.1247	0.5894	79.24	16	1
San Diego	2011	0.1057	0.5836	94.38	17	1
San Diego	2012	0.0909	0.5795	93.68	18	1
San Diego	2013	0.0857	0.5822	97.51	19	1
San Diego	2014	0.0742	0.5836	92.63	20	1
San Diego	2015	0.0732	0.5781	48.54	21	1

The University of Texas at El Paso

Announces

Borderplex Historical Data to 2018

UTEP is pleased to announce the 2020 edition of its primary source of Borderplex long-term historical economic information. Topics covered include demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, and municipal water consumption. These data comprise the backbone of the UTEP Border Region Econometric Model developed under the auspices of a corporate research gift from El Paso Electric Company and maintained using externally funded research support from El Paso Water and Hunt Communities.

The authors of this publication are UTEP Professor & Trade in the Americas Chair Tom Fullerton and UTEP Border Region Modeling Project Associate Director & Economist Steven Fullerton. 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. Steven Fullerton has published research on Major League Baseball, the National Football League, and housing price fluctuations in Las Cruces.

The border long-range historical data reference can be purchased for $20 per copy. Please indicate to what address the report(s) should be mailed (also include telephone, fax, and email address):

____

____

____

____

____

____

Send checks made out to University of Texas at El Paso for $20 to:

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

Online orders can be placed via:
https://secure.touchnet.net/C21711_ustores/web/product_detail.jsp?PRODUCTID=800

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

The University of Texas at El Paso

Announces

Borderplex Long-Term Economic Trends to 2049

UTEP is pleased to announce the 2020 edition of its primary source of long-term structural trend border economic information. Topics covered include demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, and municipal water consumption. Forecasts are generated utilizing the 250-equation UTEP Border Region Econometric Model developed under the auspices of a corporate research gift from El Paso Electric Company and maintained using externally funded research support from El Paso Water and Hunt Communities.

The authors of this publication are UTEP Professor & Trade in the Americas Chair Tom Fullerton and UTEP Border Region Modeling Project Associate Director & Economist Steven Fullerton. 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. Steven Fullerton has published research on Major League Baseball, the National Football League, and housing price fluctuations in Las Cruces.

The border long-range outlook through 2049 can be purchased for $25 per copy. Please indicate to what address the report(s) should be mailed (also include telephone, fax, and email address):

____

____

____

____

____

____

Send checks made out to University of Texas at El Paso for $25 to:

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

Online orders can be placed via:
https://secure.touchnet.net/C21711_ustores/web/product_detail.jsp?PRODUCTID=810

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

The UTEP Border Region Modeling Project & UACJ Press

Announce the Availability 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 contradictory 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 $15 per copy. Please contact Professor Servando Pineda of Universidad Autónoma de Ciudad Juárez at spineda@uacj.mx to order copies of the book. Additional information for placing orders is also available from Professor Martha Patricia Barraza de Anda at mbarraza@uacj.mx.

The University of Texas at El Paso Technical Report Series:

TX97-1: *Currency Movements and International Border Crossings*
TX97-2: *New Directions in Latin American Macroeconometrics*
TX97-3: *Multimodal Approaches to Land Use Planning*
TX97-4: *Empirical Models for Secondary Market Debt Prices*
TX97-5: *Latin American Progress under Structural Reform*
TX97-6: *Functional Form for United States-Mexico Trade Equations*
TX98-1: *Border Region Commercial Electricity Demand*
TX98-2: *Currency Devaluation and Cross-Border Competition*
TX98-3: *Logistics Strategy and Performance in a Cross-Border Environment*
TX99-1: *Inflationary Pressure Determinants in Mexico*
TX99-2: *Latin American Trade Elasticities*
CSWHT00-1: *Tariff Elimination Staging Categories and NAFTA*
TX00-1: *Borderplex Business Forecasting Analysis*
TX01-1: *Menu Prices and the Peso*
TX01-2: *Education and Border Income Performance*
TX02-1: *Regional Econometric Assessment of Borderplex Water Consumption*
TX02-2: *Empirical Evidence on the El Paso Property Tax Abatement Program*
TX03-1: *Security Measures, Public Policy, Immigration, and Trade with Mexico*
TX03-2: *Recent Trends in Border Economic Analysis*
TX04-1: *El Paso Customs District Cross-Border Trade Flows*
TX04-2: *Borderplex Bridge and Air Econometric Forecast Accuracy: 1998-2003*
TX05-1: *Short-Term Water Consumption Patterns in El Paso*
TX05-2: *Menu Price and Peso Interactions: 1997-2002*
TX06-1: *Water Transfer Policies in El Paso*
TX06-2: *Short-Term Water Consumption Patterns in Ciudad Juárez*
TX07-1: *El Paso Retail Forecast Accuracy*
TX07-2: *Borderplex Population and Migration Modeling*
TX08-1: *Borderplex 9/11 Economic Impacts*
TX08-2: *El Paso Real Estate Forecast Accuracy: 1998-2003*
TX09-1: *Tolls, Exchange Rates, and Borderplex Bridge Traffic*
TX09-2: *Menu Price and Peso Interactions: 1997-2008*
TX10-1: *Are Brand Name Medicine Prices Really Lower in Ciudad Juárez?*
TX10-2: *Border Metropolitan Water Forecast Accuracy*
TX11-1: *Cross Border Business Cycle Impacts on El Paso Housing: 1970-2003*
TX11-2: *Retail Peso Exchange Rate Discounts and Premia in El Paso*
TX12-1: *Borderplex Panel Evidence on Restaurant Price and Exchange Rate Dynamics*
TX12-2: *Dinámica del Consumo de Gasolina en Ciudad Juárez: 2001-2009*
TX13-1: *Physical Infrastructure and Economic Growth in El Paso: 1976-2009*
TX13-2: *Tolls, Exchange Rates, and Northbound International Bridge Traffic: 1990-2006*
TX14-1: *Freight Transportation Costs and the Thickening of the U.S.-Mexico Border*
TX14-2: *Are Online Pharmacy Prices Really Lower in Mexico?*
TX15-1: *Drug Violence, the Peso, and Northern Border Retail Activity in Mexico*
TX15-2: *Downtown Parking Meter Demand in El Paso*
TX16-1: *North Borderplex Retail Gasoline Price Fluctuations: 2000-2013*
TX16-2: *Residential Electricity Demand in El Paso: 1977-2014*
TX17-1: *Southern Border Recession Predictability in the United States: 1990-2015*
TX17-2: *Collegiate Football Attendance in El Paso: 1967-2014*
TX18-2: *Electricity Consumption and Economic Growth in El Paso: 1976-2015*
TX18-1: *Infrastructure Impacts on Commercial Property Values across El Paso in 2013*
TX18-2: *Electricity Consumption and Economic Growth in El Paso: 1976-2015*
TX19-1: *Hotel Sector Forecast Accuracy in El Paso: 2006-2016*
TX19-2: *Southern Border International Shopping and Employment: 1990-2016*

The University of Texas at El Paso Technical Report Series (cont.):

TX20-1: Borderplex Bridge Delay Headaches: 2010-2016
TX20-2: Las Cruces Housing Price Fluctuations: 1971-2017
TX21-1: Trade Clusters and USA Southern Border Transportation Costs: 1995-2015

The University of Texas at El Paso Border Business Forecast Series:

SR98-1: *El Paso Economic Outlook: 1998-2000*
SR99-1: *Borderplex Economic Outlook: 1999-2001*
SR00-1: *Borderplex Economic Outlook: 2000-2002*
SR01-1: *Borderplex Long-Term Economic Trends to 2020*
SR01-2: *Borderplex Economic Outlook: 2001-2003*
SR02-1: *Borderplex Long-Term Economic Trends to 2021*
SR02-2: *Borderplex Economic Outlook: 2002-2004*
SR03-1: *Borderplex Long-Term Economic Trends to 2022*
SR03-2: *Borderplex Economic Outlook: 2003-2005*
SR04-1: *Borderplex Long-Term Economic Trends to 2023*
SR04-2: *Borderplex Economic Outlook: 2004-2006*
SR05-1: *Borderplex Long-Term Economic Trends to 2024*
SR05-2: *Borderplex Economic Outlook: 2005-2007*
SR06-1: *Borderplex Long-Term Economic Trends to 2025*
SR06-2: *Borderplex Economic Outlook: 2006-2008*
SR07-1: *Borderplex Long-Term Economic Trends to 2026*
SR07-2: *Borderplex Economic Outlook: 2007-2009*
SR08-1: *Borderplex Long-Term Economic Trends to 2027*
SR08-2: *Borderplex Economic Outlook: 2008-2010*
SR09-1: B*orderplex Long-Term Economic Trends to 2028*
SR09-2: *Borderplex Economic Outlook: 2009-2011*
SR10-1: *Borderplex Long-Term Economic Trends to 2029*
SR10-2: *Borderplex Economic Outlook: 2010-2012*
SR11-1: *Borderplex Economic Outlook: 2011-2013*
SR12-1: *Borderplex Economic Outlook: 2012-2014*
SR13-1: *Borderplex Economic Outlook: 2013-2015*
SR14-1: *Borderplex Economic Outlook to 2016*
SR15-1: *Borderplex Economic Outlook to 2017*
SR16-1: *Borderplex Economic Outlook to 2018*
SR17-1: *Borderplex Economic Outlook to 2019*
SR18-1: *Borderplex Economic Outlook to 2020*
SR19-1: *Borderplex Economic Outlook to 2021*
SR20-1: *Borderplex Historical Data to 2018*
SR20-2: *Borderplex Long-Term Economic Trends to 2049*
SR21-1: *Borderplex Economic Outlook to 2022*

Most Border Region Modeling Project Technical Reports and Borderplex Economic Outlook Reports, can be downloaded for free from the University of Texas at El Paso Library:
https://scholarworks.utep.edu/border_region

Technical Report TX21-1 is a publication of the Border Region Modeling Project and the Department of Economics & Finance at The University of Texas at El Paso. For additional **Border Region** information, please visit the **www.academics.utep.edu/border** section of the UTEP web site.

utep.edu

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