Trade Liberalization, the Price of Quality, and Inequality: Evidence from Mexican Store Prices*

Benjamin Faber†

July 2014

Abstract

This paper combines a unique collection of Mexican microdata with a new empirical strategy for identifying the causal effects of import tariff cuts to present evidence on a new distributional channel of developing country trade liberalization. Motivated by a set of stylized facts in Mexican microdata on household consumption and plant production, the paper considers quality differentiation as a channel that links differences in the consumption baskets of rich and poor households to differences in plant technologies, and thus relative price changes. Guided by this framework, I exploit the barcode level microdata of the Mexican Consumer Price Index to quantify this channel empirically in the context of NAFTA. The paper presents evidence for two main new findings: Cheaper access to US imports reduces the relative price of higher quality products in Mexican cities. In turn, this relative price effect of NAFTA has led to a significant increase in Mexican real income inequality due to differences in cost of living inflation between rich and poor households.

Keywords: Market integration; cost of living; inequality; product quality
JEL Classification: F13; F15; O24

*I am grateful to Robin Burgess, Dave Donaldson, Henry Overman, Steve Redding and Daniel Sturm for their advice and support on this project. I thank Etienne Gagnon at the Federal Reserve Board in Washington D.C. for allowing me access to the more recent years of the Mexican store price data, Gabriel Romero Velasco at INEGI in Aguascalientes for his tireless support on the Mexican plant data, and Eric Verhoogen, Nicolas de Roux and Luz Angela at DANE in Bogota for granting me access and technical support on the Colombian plant input output data. I thank Pol Antras, David Atkin, Michael Best, Francisco Costa, Arnaud Costinot, Swati Dhingra, Esther Duflo, Pablo Fajgelbaum, Thibault Fally, Jason Garred, Horacio Larreguy, Guy Michaels, John Morrow, Andres Rodriguez-Clare, Thomas Sampson and Anthony Venables for very helpful conversations, and seminar participants at Berkeley, Brown, Columbia, Dartmouth, Davis, Duke, Harvard, IIES, Kellogg, LSE, MIT, Penn State, Sciences Po, Stanford, UCL, UCLA, UCSC, Warwick and Yale for comments and suggestions. This project was supported by research funding from the UK Economic and Social Research Council.

†Department of Economics, UC Berkeley and NBER; Email: benfaber@econ.berkeley.edu.

1 Introduction

How does globalization affect inequality in developing countries? The canonical approach to analyze this question is through the lens of Stolper-Samuelson, whereby trade in homogeneous final goods affects the relative returns to domestic factors of production. This paper departs from this tradition in three ways. First, I consider household price indexes in the denominator of real income, rather than nominal incomes in the numerator, as a channel through which trade liberalization can affect inequality. Second, I emphasize access to imported inputs, rather than directly traded final consumer goods. And third, I analyze relative price changes across vertically differentiated products within disaggregated product groups, rather than across sectors.

These departures are motivated by three general facts in the data. The first is the pervasive evidence that changes in relative consumer prices affect real income inequality due to differences in cost of living inflation between rich and poor households (e.g. Muellbauer, 1974; Deaton, 2003; Moretti, 2013). The second is that the vast majority of the foreign value share in developing country consumption is driven by imported intermediate inputs rather than directly traded final consumer goods.[1] The third is that the majority of the variation in the use of foreign inputs is across establishments within disaggregated product groups, rather than across sectoral averages.[2] Taken together, these facts in the data suggest that price indexes matter for real income inequality, and that access to imported inputs and price responses across differentiated products within product groups are key in capturing the consumer price implications of developing country trade liberalization.

This paper draws on a unique collection of Mexican microdata in combination with a new empirical strategy for identifying the causal effects of import tariff cuts to answer two central questions: To what extent does cheaper access to imports affect the price of product quality in developing countries?; and What are the implications of this effect for household cost of living across the income distribution? Motivated by a set of stylized facts in Mexican microdata on household consumption and plant production, the paper considers quality differentiation as a channel that links differences in the consumption baskets of rich and poor households to differences in imported value shares in production. Guided by this framework, I exploit the barcode level microdata of the Mexican Consumer Price Index to quantify this channel empirically in the context of NAFTA. The paper presents evidence for two main new findings:

[1] 85 percent of all developing country import flows over the period 1994-2000 were intermediate goods. This figure rises to 90 percent for developing country imports from developed countries, which is identical to Mexico's share of intermediates in US imports. Intermediates refer to all imports other than final consumer goods. The Online Appendix provides further details.

[2] For example, the within product group variation in imported input shares accounts for 2/3 of the total variation in the Mexican establishment level data with more than 3200 disaggregated manufacturing product groups in 1994. The Online Appendix provides further details.

Cheaper access to US imported inputs reduces the relative price of higher quality products in Mexican cities. In turn, this relative price effect of NAFTA has led to a significant increase in Mexican real income inequality due to differences in cost of living inflation between rich and poor households over the period 1994-2000.

The analysis proceeds in several steps. I begin by documenting a set of stylized facts about vertical differentiation in Mexican consumption and production at the beginning of NAFTA in 1994. A meaningful analysis of relative prices, production technologies, and household consumption within consumer product groups requires data on unit values (prices per physical unit), plant characteristics, and household expenditures at a very fine level of product aggregation. I draw on Mexican plant surveys, including rich product line level information, in combination with household consumption surveys, including individual purchase prices and quantities, to document a set of relationships between unit values and plant characteristics in production, and between unit values and household characteristics in consumption. The Mexican microdata suggest that: i) Plant product line unit values are increasing in imported input shares in production; ii) plant product line unit values are increasing in product sales; and iii) household purchase unit values are increasing in household income in consumption.

To capture these observed moments in the microdata, I propose a model of quality choice by households in consumption and by plants in production. The model closely follows existing work by Kugler and Verhoogen (2012), and serves three main objectives. First, since vertical differentiation is not directly observable in the data, the model formalizes a product quality interpretation of the documented stylized facts. Second, it yields a set of testable implications of NAFTA's effect on Mexican consumer prices that I estimate empirically by drawing on the barcode level store price microdata of the Mexican Consumer Price Index. Third, the framework guides the estimation of the cost of living implications of these relative price effects based on observable moments in the Mexican household consumption microdata across the income distribution.

To empirically estimate NAFTA's consumer price effects across the product quality ladder, I propose a new identification strategy to causally relate import access to domestic outcomes. It has been a common concern in this literature that tariff changes may be correlated with omitted factors that also affect mean sectoral outcomes.[3] Focusing instead on relative price changes within disaggregated product groups allows me to rely on the much weaker identifying assumption that tariff cuts are plausibly exogenous at the level of individual barcode product lines, especially in the case of intermediate inputs that are shared across a wide range of producers in the domestic economy.

[3]See for example discussions in Goldberg and Pavcnik (2005; 2007), and Slaughter (1998) for a survey of the empirical literature on trade induced relative price changes across industries.

To address potential remaining concerns, I also propose two new instrumental variable strategies. The first instrument for input tariff changes is based on the insight that tariff targeting at particular plants or product groups should be of less concern for a subset of intermediate inputs, such as basic chemicals, that are used widely across domestic output sectors. This approach provides a credible new identification strategy for estimating the effects of access to foreign inputs that can be used in a wide range of empirical settings. The second instrument is based on the same subset of widely used inputs, but also makes use of uniquely rich Colombian plant microdata to overcome the additional concern that large plants are disproportionately weighted in conventional input output matrices. In a final set of robustness results, I exploit the richness of the collected store price microdata to report three different placebo falsification tests.

In support of the first testable implication, the estimation results suggest that products with initially higher unit values experience a significantly stronger reduction in their relative prices within product groups that are subject to larger tariff cuts on their intermediate inputs over the period 1994-2000. That is, the relative price of initially more expensive items decreases in product groups that gain cheaper access to US inputs. The model also yields testable implications concerning the heterogeneity of this effect. In particular, the observed average effect should be driven by differentiated product groups in which initial price differences are more informative about differences in quality and plant technologies. To test this prediction empirically, I follow a two stage procedure. In the first stage, I use the model's estimation equation for sectoral scopes for quality differentiation in terms of observable moments in the plant microdata in 1994, and verify to what extent these estimates correspond to commonly used 'off-the-shelf' measures of vertical differentiation across product groups. In the second stage, I find that the observed average effect of input tariff cuts on relative store prices within product groups is in fact driven by more differentiated product groups. A final testable implication of the model concerns the effect of access to imported inputs on the reallocation of market shares towards higher quality products. To test this prediction, I draw on detailed monthly listings of product entry and exit in the monthly store price surveys, and present evidence in support of this effect.

To evaluate the consequences of NAFTA's observed store price effects for differences in household cost of living inflation, the model yields a convenient estimation equation in terms of observable moments in the household consumption microdata. I discuss the key assumptions underlying this expression and outline the empirical strategy to estimate it from the data. I find that the average tariff cut under NAFTA between 1993-2000 (12 percentage points) has led to 1.4-4.4 percentage points higher cost of living inflation in tradable consumption among

the poorest urban income quintile compared to the richest over the six year period 1994-2000. In terms of magnitude and direction, NAFTA's estimated effect on the price of quality and household cost of living reinforces the increase in nominal Mexican income inequality, and is equivalent to approximately 25-55 percent of the total observed differences in nominal income growth between the identical urban income quintiles over the same period.[4]

The paper relates to several strands of literature. It is related to existing empirical work on trade and inequality in developing countries. A comprehensive review of this literature is given in Goldberg and Pavcnik (2007), and more recent contributions include Verhoogen (2008), Topalova (2010) and Brambilla *et al.* (2012). The focus of this literature has been on trade induced differences in nominal income growth across skill or income groups. This paper, on the other hand, analyzes a distributional channel of developing country trade liberalization that links changes in the relative price of product quality to differences in household cost of living inflation across the income distribution.[5]

There are a number of notable exceptions to the focus on nominal income inequality. Porto (2006) combines scheduled Argentinian tariff changes under Mercosur with household expenditure shares across seven consumption sectors to simulate household inflation differences. Broda and Romalis (2008) analyze the link between consumer good imports from China and household inflation differences using homescanner data in the US. More recently, Fajgelbaum and Khandelwal (2013) propose a quantitative trade model to estimate the unequal price index implications of trade openness based on country level aggregate statistics and model parameters estimated from trade flows. Outside the focus on trade earlier work by Deaton (1989) predicts the cost of living implications of agricultural price changes using household consumption surveys. To the best of my knowledge, this paper is the first to empirically estimate the cost of living implications of relative consumer price changes across the product quality ladder in the empirical context of developing country trade liberalization.

The paper also relates to recent contributions on quality choice in a setting with *ex ante* heterogeneous firms (Johnson, 2012; Kugler and Verhoogen, 2012; Feenstra and Romalis, 2013). This paper introduces quality choice by heterogeneous households into this setting, and draws attention to the distributional implications of that arise when differences in consumption baskets across the income distribution are linked to differences in plant technologies through quality differentiation.

Finally, the paper is related to existing literature on non-homotheticity in international

[4]This comparison takes into account that tradable consumption accounts for only 54 percent of total consumption in 1994.

[5]The paper also relates to recent literature on the effects of access to imported inputs in a developing country context (e.g. Amiti and Konings, 2007; Goldberg *et al.*, 2010; Halpern *et al.*, 2011).

trade. Non-homothetic preferences were originally introduced to explain part of the variation of cross-country trade flows left unaccounted for by neoclassical trade theory (Trefler, 1995; Choi *et al.*, 2009; Fieler, 2011; Caron *et al.*, 2012). Rather than focusing on the implications for trade flows, this paper analyzes the implications of non-homotheticity for the distributional effects of trade liberalization in a developing country.

The remainder of the paper is structured as follows. Section 2 describes the background and data. Section 3 documents stylized facts about vertical differentiation in Mexican consumption and production at the beginning of NAFTA in 1994. Section 4 presents the theoretical framework. Section 5 presents the empirical estimation of NAFTA's effect on Mexican consumer prices. Section 6 presents the estimation of the cost of living implications of these relative price effects. Section 7 concludes.

2 Background and Data

2.1 Mexican Trade Liberalization

Mexican trade liberalization began as part of government stabilization efforts in response to the severe economic crisis at the beginning of the 1980s. When Mexico joined the General Agreement on Tariffs and Trade (GATT) in 1986, it initially agreed to bind tariffs at a ceiling of 50 percent. In December of 1987 the government then implemented another consolidation of its tariff schedule whereby all non-agricultural import tariffs were set at either zero, five, ten, fifteen, or twenty percent (Kate, 1992). Following this first wave of liberalization, the Mexican tariff schedule remained largely unchanged between the end of the 1980s until the beginning of NAFTA in January 1994.

NAFTA represented a major second wave of Mexican import tariff reductions. While in 1993 only 10 percent of manufacturing imports from the US fell into a tariff category of 15 percent or less, this fraction increased to 60 percent in January of 1994 (Lopez-Cordova, 2002). In contrast, NAFTA had a smaller effect on US tariffs on Mexican exports as these were at already low levels before NAFTA took effect.[6][7] Any analysis of NAFTA's consequences in Mexico must address the empirical challenge that the beginning of NAFTA coincided with a severe economic crisis that unfolded in Mexico in 1995, the adverse consequences of which are apparent in Mexican real income data until the beginning of the following decade (Attanasio and Binelli, 2010). As discussed in detail in Section 5, the empirical analysis addresses such concerns by focusing on parts of the variation in relative price changes that are plausibly

[6]The average export tariff was approximately 2 percent in December 1993.

[7]The Online Appendix provides an illustration of average Mexican tariff changes on US imports and their sectoral variation over the period 1993-2000. Concerning the importance of other trade partners, US imports have consistently accounted for 75-80 percent of total Mexican imports during the 1990s. In particular, the period under study precedes China's admission to the World Trade Organization in 2001 and the subsequent surge of Chinese imports into Mexico (Iacovone *et al.*, 2010).

unrelated to the consequences of macroeconomic shocks, and reports a series of additional results to test the validity of the identification strategy.

2.2 Data

The following subsections describe the main datasets used in this paper, and the Online Appendix provides further details.

2.2.1 Central Bank Store Price Surveys

The majority of countries including Mexico are subscribers to the ILO/IMF Consumer Price Index Dissemination Standard. This manual imposes a clear set of rules on how to compile and process data in order to report national consumer price inflation. The backbone of national CPI reporting are store price surveys that are collected from a nationally representative sample of stores throughout the country and usually at several times during each month. In the case of Mexico, the Articulo 20-Bis of the Codigo Fiscal de la Federacion requires Mexico's central bank since January of 1989 to publish these store price microdata on a monthly basis in the official government gazette, the Diario Oficial de la Federacion. These publications are phone book like listings of individual city-by-store-by-barcode level product combinations and their price quotes in a given month.[8]

Starting from 1989, each month of data contains approximately 30,000 individual price quotes across 35 Mexican cities and 284 product groups covering non-durables (e.g. Salchicha sausages, paper towels, antibiotic pills), durables (e.g. electric kitchen mixers, refrigerators, bicycles), as well as services (e.g. language courses, taxi rides, dentist visits).[9] For the empirical analysis, I compute average price quotes of individual barcode-by-store items across three months in the third quarters of 1989, 1993, 1994, 2000, and the first quarter of 1995.[10]

These price data have a number of important features. First, the survey is intended to capture a representative sample of Mexican household consumption and covers street vendors, markets, convenience and specialized stores, as well as supermarkets and department stores across cities. Second, any change in the presentation, appearance, size, modality, model number or otherwise is reported in an appendix listing of the monthly publications in the Diario Oficial

[8]While the actual product barcode is not reported, the detailed product descriptions including brand, product name, pack size, model number, and modalities (e.g. color, packaging type) provide an equivalent level of product identification for the majority of processed tradable product groups. This is generally not the case for services (e.g. taxi rides) or unprocessed agricultural products (e.g. tomatoes).

[9]For product groups in food and beverages the reported monthly price quotes are averages across 2-4 monthly price quotes for each item. The number of cities and product groups increased in a revision in March 1995. The stated figures refer to cities and product groups that were consistently covered both before and after the revision in 1995. The Online Appendix provides further details.

[10]The price quotes of the latter three periods were provided by courtesy of Etienne Gagnon at the Federal Reserve Board in Washington D.C. A detailed description of this dataset can be found in Gagnon (2009). For the third quarter price quotes in 1989 as well as 1993, I obtain copies of archival records contained in the Archivo General de la Nacion in Mexico City, and digitize these monthly price quotes by double blind data entry. The percentage of non-identical entries was approximately 1 percent. These cells were then double checked and corrected by hand.

as a product item substitution. This appendix also reports instances in which the sampled basket of products expanded due to product additions. The objective of the Mexican central bank is to compute price inflation for identical product items over time. This is to say that what I refer to as "persistent" product series are identical barcode products in the identical store over time.[11] This detailed documentation also allows me to test predictions on product replacements and additions in addition to relative price changes of persistent barcode items.

Third, price quotes are reported in prices per common physical unit for the majority of product groups. For product groups where this is not consistently the case (e.g. measured per pack of toilet paper, or measured per bottle of body lotion), I either clean the data by hand to convert it to common physical units (e.g. per roll of toilet paper reported in the product description, or per 100ml of body lotion), or I exclude the product group from the estimations where such a correction is not feasible (e.g. clothing items where reported prices are based on store sample averages within a city so that changes in product attributes are unobserved).

Fourth, the sampling framework of the store price surveys, both in terms of product groups and in terms of city locations, has been designed to match the sampling framework of the urban household segment in the ENIGH household consumption surveys discussed below. The first implication of this is that the level of aggregation in product groups is close to identical between the two surveys. The second implication is that the prices within product groups observed in the store price microdata over a given period are drawn from the same population of store prices faced by households in the consumer surveys when observed over the same period. Both of these features will be important for the analysis of the cost of living implications in Section 6.

Finally, the collected store price microdata have one important limitation. While each city-store-barcode item has a unique identifier code that can be tracked over time, the individual store identifiers cannot be recovered from these item codes.[12] Potential estimation concerns arising from this limitation will be addressed in detail in the empirical analysis.

The store price estimation sample is a panel of individual city-store-barcode items within 153 processed tradable product groups that report individual barcode level unit values over time. The Online Appendix presents descriptive statistics of the store price microdata together with a breakdown of the estimation sample's coverage of total household expenditure among urban Mexicans in 1994 and 2000. It also provides a detailed list of the included and excluded product groups together with a description of the dataset and processing.

[11] To this end, I digitize the complete series of product substitution appendices from January 1989 to the end of 1993 and I obtain the more recent substitution listings between 1994-2000 by courtesy of Gagnon (2009).

[12] The original reason for encoding the store identifier in the Diario publications was confidentiality concerns. Unfortunately, the correspondence table between the published and the actual store identifiers appears to have been lost for the period before 2002.

2.2.2 Manufacturing Establishment Surveys

There are generally two main empirical challenges when empirically investigating vertical product differentiation in plant microdata. The first is that the majority of manufacturing establishment surveys do not report physical output quantities in combination with sales revenues to compute output unit values. The second is that product quality differentiation is empirically meaningful only at a very fine level of product aggregation. Most plant surveys report two digit (e.g. food processing), four digit (e.g. meat processing), or sometimes six digit (e.g. meat products except poultry) industrial classifications, which would be insufficient to match the detailed product groups that are present in the store price surveys described above.

Fortunately, the microdata reported in the Mexican monthly manufacturing establishment survey (Encuesta Industrial Mensual (EIM)) make it possible to address both of these challenges. Starting in 1994, the survey reports monthly physical output in combination with sales at the level of several thousands of product groups within 203 six digit CMAP manufacturing sectors of which 78 six digit sectors produce final consumption goods. Plants on average report output and sales across several products, so that the level of aggregation present in the data can be thought of as individual product lines within an establishment.

The second plant dataset that I draw on in the analysis is the Encuesta Industrial Anual (EIA) which covers the identical plants at annual intervals. In particular, I use the EIA to complement the EIM data with annual plant level information on the use of imported inputs as well as employment. Both the EIM and the EIA microdata are administered by the Instituto Nacional de Estadistica, Geografia, e Informatica (INEGI). I obtained access to the confidential microdata for 12 months of the EIM data in 1994 and the corresponding annual records for 1994 contained in the EIA. These establishment surveys cover all manufacturing production sectors and represent roughly 85 percent of total Mexican manufacturing output. The data do not cover the universe of Mexican production establishments as the surveys typically omit the tail of small producers (INEGI, 2000). The Online Appendix presents descriptive statistics of the 1994 plant microdata.

2.2.3 Household Consumption Surveys

I use the microdata of the Mexican national household consumption survey in 1994 (Encuesta Nacional de Ingresos y Gastos de los Hogares, ENIGH) for information on per capita household incomes, expenditure weights and unit purchase values across 255 processed tradable product groups (see Online Appendix for details). These surveys are administered by INEGI from where I obtain access to the data. To be consistent with the urban only coverage of the store price surveys, I only use data on households in urban classified municipalities.[13]

[13] In the ENIGH 1994 survey, these are defined as municipalities with more than 2500 residents.

There are several notable features of the household consumer surveys. First, the urban sampling framework has been designed to match the geographical coverage of the store price surveys across the same cities. Second, urban household survey weights have been designed to produce nationally representative estimates for urban Mexicans. Third, they are collected to represent total household consumption expenditure during the third quarter of 1994, which coincides with my data collection of the central bank store price series. Third, they provide a rich breakdown of several hundreds of product groups that have a close to identical level of product aggregation as that reported in the store price survey data. Fourth, they report every single transaction within a product group made by members of the household. Fifth, they report unit values (e.g. per kilogram or per liter) for 118 product groups that pertain to food and beverages and tobacco expenditures. Finally, the surveys report the store type linked to every single transaction. The store types include street vendors, markets, convenience and specialized stores, and supermarkets and department stores.[14]

2.2.4 Input Tariffs

Intermediate input tariff changes are computed at the four digit industrial classification (NAICS) of the Mexican 2003 input output table for a total of 90 manufacturing input sectors.[15] I use total (direct and indirect) requirement coefficients to compute the weighted average US tariff changes across four digit input sectors for each output sector. Tariff changes at the four digit NAICS level are based on average tariff changes across eight digit tariff lines from the Mexican Secretaria de Economia. NAFTA tariff changes in the estimations refer to the difference between average applied rates during the year 2000 and December 1993.[16]

Three empirical challenges arise when using the available Mexican input-output data to estimate the effect of product group specific input tariff cuts on relative price changes across products within the group. First, four digit output sectors (e.g. electrical appliances or clothing) are much more aggregated than the consumer product groups that we are able to observe in the Mexican store price and consumption microdata described above, and that one would think of in terms of quality differentiation within groups. Second, the empirical objective is to capture the structure of input usage during the period before NAFTA came into effect in

[14]The Online Appendix presents an overview of the shares of consumption expenditures captured by the processed tradables estimation sample, and provides descriptive statistics for the urban household ENIGH sample in 1994.

[15]This is the most recent available Mexican IO table since 1979. A data request had to be filed at INEGI in order to obtain the four digit break up of the Mexican IO table.

[16]I choose simple average tariff changes for the same reason as discussed for the unweighted input-output coefficients in this subsection. The concern with using import weighted average tariff changes would be that larger plants are captured more accurately in the tariff measures, giving rise to concerns about non-traditional measurement error in the present within-sector setting with heterogeneous firms. The Online Appendix provides an illustration of average Mexican tariff changes on US imports and their cross-sectoral variation over the period 1993-2000.

1994, whereas the available Mexican data provide input coefficients only about ten years after the tariff reform and other economic changes had taken effect.

The third concern is that the construction of input output information is poorly suited for a setting with plant heterogeneity within sectors. Because input output data are collected as the sums of total inter-sectoral flows, they capture plant size weighted averages of input requirements across sectors, rather than the production technology of the average plant within a sector. As further discussed in the empirical analysis in Section 5, to the extent that large producers differ in technologies (see the next section), this aggregation can give rise to non-traditional measurement error because output weighted input requirements capture the input use of larger plants more accurately than those of other producers in the sector.

To address these concerns about the available Mexican input output data, I also make use of uniquely rich Colombian plant microdata. In particular, the Colombian plant surveys allow me to observe the input requirements of individual plants within disaggregated eight digit product groups for the years 1992 and 1993. As discussed in more detail in Section 5, I use these data as part of an instrumental variable strategy for tariff cuts on imported intermediate inputs across output product groups in Mexico.[17]

3 Stylized Facts about Vertical Differentiation in Mexican Consumption and Production

This section draws on the Mexican plant and household microdata to document a set of stylized facts about vertical differentiation in production and consumption at the beginning of NAFTA in 1994. These moments in the data serve to motivate the theoretical framework in Section 4 and the empirical analysis in Sections 5 and 6.

Plant Product Line Unit Values Increase in Imported Input Shares: Figure 1 depicts the first stylized fact. The graph plots the relationship between deviations of product line log unit values (prices per common physical unit) and plant level imported input shares relative to product-by-period and state-by-period fixed effects in 1994. Estimations are based on 2615 plants reporting across 8924 unique product lines in 1000 product groups pertaining to 78 six digit manufacturing sectors that produce consumer goods. The unit value-import share elasticity is positive and statistically significant at the 1 percent level. On average higher unit values within disaggregated product groups embody significantly larger shares of imported inputs.

Plant Product Line Unit Values Increase in Market Shares: Figure 2 depicts the second

[17]The Online Appendix illustrates the strength of the correlation between Colombian and Mexican input output coefficients when measured during the same year, and provides further details about the Colombian and Mexican product groups. Additional details about the Colombian plant data are also provided in Kugler and Verhoogen (2009; 2012).

stylized fact. The graph plots the relationship between deviations of product line log unit values and product line log sales relative to product-by-month and state-by-month fixed effects in 1994. The estimation is based on the identical sample of plants and product lines reported for the previous figure. The unit value-sales elasticity is positive, close to log linear, and statistically significant at the 1 percent level. On average higher unit values within disaggregated product groups embody significantly larger market shares.[18]

Household Purchase Unit Values Increase in Household Income: Figure 3 depicts the third stylized fact. The graph plots the relationship between deviations of household weighted average log unit values relative to municipality-by-product-by-store type fixed effects and deviations of log household incomes from the national mean in 1994. Estimations are based on a nationally representative sample of 7764 urban households across 236 municipalities in Mexico and 255 processed tradable product groups. The weights are given by households expenditure weights attached to each reported purchase. Reported store types are markets, street vendors, convenience and specialized stores, and supermarkets and department stores.[19] For purchases in the same city-by-product-by-store type cell, average household expenditure unit values are significantly increasing in household per capita incomes.

These moments in the data at the beginning of NAFTA motivate a theoretical framework in which differences in household expenditures across the income distribution are linked to differences in plant technologies through vertical differentiation in consumption and production. Figures 1 and 3 suggest that consumption differences between rich and poor households are systematically related to differences in imported value shares across producers within product groups, while Figure 2 will serve to relate these observed relationships in terms of price differences to unobserved differences in product quality.

While these moments in the Mexican microdata have been documented separately in other country contexts, they have so far not been considered in a unified framework.[20] The remainder of the paper has the two-fold objective to formalize a product quality interpretation of the documented stylized facts, and to empirically test the implications for real income inequality

[18] A potential concern with the estimated relationship is that both unit values on the y-axis and plant sales on the x-axis are based on reported plant revenues. To verify that correlated measurement errors are not driving the upward sloping relationship between unit values and plant sizes in Figure 2, the Online Appendix replicates this graph when using log establishment employment as an alternative indicator of plant size. Section 5 also reports instrumental variable estimates of the unit value-sales elasticity before and after instrumenting for log sales with log establishment employment. The reported results are also consistent with the findings in Kugler and Verhoogen (2012) who use similarly rich Colombian plant microdata.

[19] In Section 6 I report the estimated price gaps between rich and poor households both before and after the inclusion of store type fixed effects in order to learn about the potential role of heterogeneous store markups for identical barcode items across households in Figure 3. As discussed in more detail below, the inclusion of store type fixed effects appears to increase rather than decrease the estimated unit value differences.

[20] On the production side, the presented results confirm recent findings in Kugler and Verhoogen (2009; 2012) from similarly rich Colombian plant microdata. On the consumption side, for example Deaton (1988) discusses evidence of within village unit value differences among rich and poor households.

that arise from this setting in the context of NAFTA trade liberalization in Mexico.

4 Theoretical Framework

This section presents a model of quality choice in a setting with heterogeneous households in consumption and heterogeneous plants in production. The model closely follows existing work by Kugler and Verhoogen (2012), and serves three main objectives in the current setting. First, because vertical differentiation is not directly observed in the data, the model formalizes a product quality interpretation of the documented stylized facts. Second, it yields a set of testable implications of NAFTA's effect on Mexican consumer prices that I test empirically in Section 5. And third, it guides the estimation of the cost of living implications of these relative price effects across the Mexican income distribution based on observable moments in the consumption microdata in Section 6.

Kugler and Verhoogen (2012) propose a model of endogenous quality choice across *ex ante* heterogeneous firms in a setting with complementarity between plant productivity and input quality in the production of output quality. To capture the observed moments in the Mexican microdata of the previous section, I introduce two features into this setting. On the consumption side, I allow for heterogeneous household quality evaluations so that when faced with identical prices rich and poor households allocate their consumption expenditure differently across the quality ladder. On the production side, I introduce the assumption that input quality is increasing in the use of imported inputs. The following provides a brief summary of the key features of the model, and additional results are provided in the Online Appendix.

4.1 Preferences

A household h's preferences are given by a two-tier Dixit-Stiglitz utility function in which the upper tier is Cobb Douglas across product groups denoted by subscript k, while the subutility index U_{hk} is a CES function over varieties denoted by subscript i within the product group.[21]

$$U_h = \int_{k=0}^{K} U_{hk}^{\mu_{hk}} \mathrm{dk} \quad U_{hk} = \left(\int_{i=0}^{I_k} \left(q_{ki}^{\varphi_h} x_{hki} \right)^{1-1/\sigma} di \right)^{\frac{1}{1-1/\sigma}} \quad 0<\mu_{hk}<1 \quad \sigma>1 \tag{1}$$

For ease of exposition, product group subscripts k are suppressed in the remainder of this subsection. Household utility is a function of physical units consumed, x_{hi}, and a variety's quality $q_i^{\varphi_h}$, where $\varphi_h>0$ is a household specific taste-for-quality parameter. Product quality q_i enters as a shift in utility derived from consuming a given amount of physical units, and the extent of this shift is allowed to vary across household valuations of quality. To introduce

[21] The assumption that household heterogeneity enters through quality evaluations rather than through heterogeneity in price elasticities is consistent with recent evidence from home scanner data in Handbury (2012) for the US.

non-homotheticity across the income distribution in a reduced form approach, I let φ_h be a positive function of household per capita income, as for example proposed in Hallak (2006).[22] Differences in household income, in turn, enter the model through differences in household endowments of effective labor units.

The first implication of (1) is that a household's expenditure shares within product groups increase in φ_h for products with above average quality, and decrease in φ_h for below average quality products.[23] As a consequence, the weighted average quality of the household's consumption basket increases in its quality valuation φ_h.

The second implication of (1) concerns the elasticity of sales with respect to product quality, holding prices constant. Letting y_{hi} and y_i indicate household h's expenditure on variety i within a product group and total market sales of variety i respectively, this becomes:

$$\frac{d\left(\sum_H y_{hi}\right)}{\left(\sum_H y_{hi}\right)} / \frac{dq_i}{q_i} = (\sigma - 1)\left(\sum\nolimits_H \frac{y_{hi}}{y_i}\varphi_h\right) = (\sigma - 1)\,\varphi_i^* \tag{2}$$

Sales respond to changes in physical product quality with elasticity $(\sigma - 1)\,\varphi_i^*$, where $\varphi_i^* = \sum_H \frac{y_{hi}}{y_i}\varphi_h$. This is in contrast to the usual representative agent assumption where by setting $\varphi_i^* = \bar{\varphi_h} = 1$, one can avoid any distinction between physical product quality (q_i) (e.g. design or durability) and the perceived quality $\left(q_i^* = {q_i}^{\varphi_i^*}\right)$ that sellers observe from the demand for their product in the market place. In the presence of heterogeneous quality evaluations in (1), this distinction cannot be avoided because the observed market valuation of a product's quality characteristics reflects an aggregation of heterogeneous evaluations of the identical physical features.

This reference evaluation $\left(\varphi_i^* = \sum_H \frac{y_{hi}}{y_i}\varphi_h\right)$ is the expenditure weighted average valuation of consumers who spend on the product, which is not constant across different levels of physical product quality. In fact, (1) implies that expenditure shares $\left(\frac{y_{hi}}{y_i}\right)$ of households with lower (higher) quality evaluations are decreasing (increasing) in an item's physical quality. In the present setting, (2) has one main implication: It will affect the modeling of quality choice by plants on the production side of the Kugler and Verhoogen (2012) model, in order to derive the observed close to log linear unit value relationships in Figures 1 and 2 as equilibrium outcomes. To see this more clearly, note that (2) implies that holding prices constant a given percentage increase in physical quality leads to a larger percentage increase in sales for an initially higher

[22] A straight forward way to microfound this structure would be to assume complementarity between the consumption of a (normal) outside good and higher quality within differentiated product groups. See for example Handbury (2012).

[23] To see this, we can solve for the derivative of household expenditure shares with respect to φ_h as a function of product quality: $\frac{\partial s_{hi}}{\partial \varphi_h} = (\sigma\text{-}1) s_{hi}\,(\ln q_i - \sum_I s_{hi} ln q_i)$.

quality product compared to a lower quality item.[24] In contrast, this elasticity is constant and equal to $(\sigma - 1)$ with respect to perceived quality (q_i^*). Through the lens of the preferences in (1) and (2), the moments in Figures 1-3 from the Mexican microdata at the beginning of NAFTA imply that perceived product quality is on average close to log linearly increasing in product unit values and imported input shares, decreasing in quality adjusted prices, and consumed to a higher extent by richer households.[25]

4.2 Technology

On the production side, the final goods sector consists of a continuum of monopolistically competitive plants that produce horizontally and vertically differentiated varieties within a given product group. Production of the final good can be separated into a production function of physical units, and a production function of quality that depends on plant characteristics and input quality. The production function of final goods is given by:

$$F_{Fi}=\lambda_i m_i \tag{3}$$

λ_i is a plant specific productivity parameter that I will refer to as technical efficiency. It defines the efficiency at which a plant converts a given number of intermediate inputs, m_i, into units of final products. Following Kugler and Verhoogen (2012), the production of final product quality is subject to complementarity between input quality, z_i and technical plant efficiency:[26]

$$q_i^*=\left(\alpha\lambda_i^{\psi\vartheta}+(1-\alpha)z_i^{\gamma\vartheta}\right)^{1/\vartheta} \qquad \vartheta<0 \quad \psi>0 \quad \gamma>0 \quad 0<\alpha<1 \tag{4}$$

Here, ϑ determines the degree of complementarity between technical plant efficiency and input quality, and the assumption $\vartheta<0$ imposes log supermodularity of quality in plant efficiency and intermediate quality.[27] The intermediate input is produced subject to perfect competition

[24] To see this, we can write: $\varphi_i^*=\sum_H \frac{y_{hi}}{y_i}\varphi_h = N_H Cov\left(\frac{y_{hi}}{y_i};\varphi_h\right)_i + \bar{\varphi_h}$. The intuition for this result is that the sales of higher (lower) quality products are driven to a higher (lower) extent by consumers who attach greater value to a given percentage change in quality, so that sales respond more (less) to a given change in quality.

[25] To see this from Figure 2, we can write the elasticity of sales ($\sum_H y_{hi} = y_i$) with respect to unit prices as: $\frac{dy_i}{y_i}/\frac{dpi}{p_i}=(\sigma-1)\left(\frac{d\mathrm{q}_i^*}{\mathrm{q}_i^*}/\frac{dpi}{p_i}-1\right)$. Since this slope is positive in the data, it implies that $\frac{d\mathrm{q}_i^*}{\mathrm{q}_i^*}/\frac{dpi}{p_i} > 1$, and so $\frac{d\mathrm{q}_i^*/p_i}{\mathrm{q}_i^*/p_i}/\frac{dpi}{p_i} > 0$. Each of these relationships holds qualitatively for physical product quality, but as shown in (2) the log linear functional forms do not after acknowledging the presence of heterogeneous quality evaluations suggested by Figure 3 in the data.

[26] This is consistent with empirical findings in Kugler and Verhoogen (2009) and Manova and Zhang (2012).

[27] $\vartheta<0$ assures that a marginal increase in input quality leads to a greater increase in final product quality for a higher λ_i plant. Note that in (4) product quality enters the production side not as physical concept q_i, but in terms of market valuation q_i^*. This is equivalent to a functional form assumption in the quality production function. In particular, (4) yields equilibrium relationships between unit values, market shares, and input usage that are consistent with the close to log linear functional forms documented in the Mexican

using labor hours denoted by l. The input production function is:

$$F_{Mj}=\frac{l_j}{z_j^{\delta(\tau)}} \tag{5}$$

Intermediate unit costs thus increase in input quality. Substituting intermediate unit costs into final product unit costs, we get $c_i=\lambda_i^{-1}p_{im}=\lambda_i^{-1}\mathrm{w}z_i^{\delta(\tau)}$, where w is the wage rate. Kugler and Verhoogen (2012) interpret the input characteristic z_i as intermediate quality which is complementary to plant efficiency in producing output quality in (4). The simplest possible way to introduce foreign inputs into this setting is by letting input quality be increasing in shares of imported inputs. (5) captures this assumption in a simple reduced form approach by letting the elasticity of unit input costs with respect to input quality (δ) be an increasing function of imported input costs (τ).[28]

4.3 Equilibrium

As in Melitz (2003), to enter the final-good sector, plants pay an investment cost f_e measured in domestic labor units in order to receive a technical efficiency draw λ. The distribution of this parameter is assumed to be Pareto with a c.d.f. $G(\lambda)=1-\left(\frac{\lambda_m}{\lambda}\right)^{\xi}$, where $\lambda_m<\lambda$, and ξ is the shape parameter. There is a fixed cost of production, f in each period, and plants exit with exogenous probability χ each period. Given zero cost of horizontal differentiation, each plant choosing the same product quality produces a distinct variety so that λ can be used to index both plants and varieties.

In equilibrium plants simultaneously choose output quality and prices to maximize profits, while households maximize utility in (1). The equilibrium elasticity of product unit values with respect to perceived quality is given by $\frac{\partial lnp_{ki}}{\partial lnq^*_{ki}}=\eta_k=\frac{\delta(\tau_k)}{\gamma}-\frac{1}{\psi_k}$. Here, the parameter ψ_k from the quality production function (4) represents the equilibrium elasticity of perceived quality with respect to plant efficiency $\left(\frac{\partial lnq^*_{ki}}{\partial ln\lambda_{ki}}\right)$. Following Kugler and Verhoogen (2012) and earlier work by Sutton (1998), this parameter can be thought of as a product group specific scope for quality differentiation. A given distribution of *ex ante* plant heterogeneity leads to a wider range of product quality if the scope parameter ψ_k is greater. Intuitively, the first term in η_k represents the unit cost-quality elasticity in absence of endogenous plant sorting, while the second term captures the equilibrium link between plant efficiency and quality.

4.4 Testable Implications

The model guides the empirical estimation in two main ways that I summarize here in the order of the two subsequent empirical sections. First, the model yields a set of observable

plant microdata.

[28] Since the analysis deliberately abstracts from relative factor income effects of import access, this is convenient but without loss of generality. See Online Appendix for further details.

implications of NAFTA's effect on Mexican consumer prices (Predictions 1-3). Second, it yields a convenient estimation equation of the cost of living implications of these price effects in terms of observable moments in the household consumption microdata (Prediction 4).

The Mexican store price data summarized in the Online Appendix suggest that 80 percent of the surveyed barcode products were persistently observed in both 1994 and 2000 without changes in product characteristics or presentation over the period. In a first step, I thus derive two testable implications on relative price changes across persistent barcode product lines that are observed in both periods (i.e. holding initial quality unchanged). In a second step, I relax this assumption to take into account observed product exit and entry in the store price microdata over the period, and derive a third prediction on the effect of input tariff cuts on exit and entry propensities across the product quality distribution.

The first testable implication concerns the average effect of input tariff cuts on the relative prices of products across the quality ladder within product groups.

Prediction 1: *Input tariff cuts decrease the relative price of higher quality products.*

$$\frac{\partial^2 lnp_{ki}}{\partial lnq^*_{ki}\partial\tau_k}=\frac{\partial\eta_k}{\partial\tau_k}>0 \tag{6}$$

Because the production of higher quality is intensive in imported inputs, cheaper access to foreign inputs reduces the elasticity of unit values with respect to product quality (η_k). Coupled with the observation in Figures 1 and 2 that on average $0 < \eta_k < 1$ across consumer product groups, the observable counterpart of this prediction in the store price microdata is that input tariff cuts on average lead to a reduction in the relative price of barcode items with initially higher positions in the unit value distribution within product groups. That is, the relative price of initially more expensive items observed in the store price data should on average decrease more in product groups that experience higher cuts on their input tariffs relative to other product groups.

The second testable implication concerns the heterogeneity of this average effect as a function of differences in the scope for product differentiation across product groups. In particular, I can exploit a common feature of existing models of quality choice across heterogeneous firms for empirical estimation. This feature is that unit values embody technological heterogeneity differently across product groups with different scopes for quality differentiation.[29]

Prediction 2: *The observed average effect of input tariff cuts on relative prices is driven by differentiated product groups.*

[29]This feature is present here as well as in for example Johnson (2012) and Kugler and Verhoogen (2012).

$$\frac{\partial^2 lnp_{ki}}{\partial lnp_{ki}^{t0}\partial \tau_k} = \begin{cases} 0 & \text{for } \eta_k = 0 \text{ (”Undifferentiated”)} \\ \frac{1}{\eta_k}\frac{\partial \eta_k}{\partial \tau_k} > 0 & \text{for } \eta_k > 0 \text{ (”Differentiated”)} \end{cases} \tag{7}$$

To empirically estimate differences in sectoral scopes for quality differentiation, the model yields a convenient estimation equation in terms of observable moments in the plant microdata:

$$\frac{\partial lnp_{ki}}{\partial ln\left(\frac{q^*_{ki}}{p_{ki}}\right)} = \frac{\eta_k}{1-\eta_k} = (\sigma - 1)\frac{\partial lnp_{ki}}{\partial lns_{ki}} \tag{8}$$

where the final term is a product group specific elasticity between unit values and market shares. In particular, product group differences in this observable elasticity provide a sufficient statistic to separate product groups into sectors that show a statistically significant relationship between initial unit values and quality ($\eta_k > 0$), which I refer to as differentiated, and sectors without a significant relationship between unit values and quality (η_k close to 0), which I refer to as undifferentiated.[30]

The third testable implication considers the general equilibrium effect of input tariff cuts on product exit and entry across the quality ladder within product groups.

Prediction 3: *Input tariff cuts lead to a higher propensity for product exit at the lower end of the quality distribution, and to a higher propensity for product entry at the higher end.*

$$\frac{\partial \lambda_k^{cutoff}}{\partial \tau_k} > 0, \text{ and } \frac{\partial q^*_{ki}}{\partial \tau_k} < 0 \tag{9}$$

It is apparent from (4) and (5) that cheaper access to higher quality inputs benefits producers of higher final good quality relatively more. By reducing η_k this increases the elasticity of plant revenue with respect to quality in the final good sector ($\frac{\partial lns_{ki}}{\partial lnq^*_{ki}} = (\sigma - 1)(1 - \eta_k)$, and $\frac{\partial^2 lns_{ki}}{\partial \tau_k \partial lnq^*_{ki}} < 0$), and implies a reallocation of market shares upwards along the quality ladder. Because in general equilibrium this elasticity enters negatively in the denominator of the minimum productivity cut-off for the marginal plant choosing to produce, this leads to an increase in the productivity cut-off value within product groups.[31] The testable implication is that product groups with higher tariff cuts on their imported inputs experience a higher propensity of product exit at the lower end of the initial quality distribution.

[30] Intuitively, as the link between plant efficiency and product quality (captured by scope parameter ψ_k) decreases, η_k decreases. In differentiated sectors unit values increase with product quality, but less than one for one due to higher plant productivities associated with quality. In non-differentiated sectors more productivity improvements are necessary to produce units of quality so that prices are insignificantly related to higher plant capability and product quality.

[31] As discussed in the Online Appendix, this is given by $\left(\lambda_k^{cutoff} = \lambda_{mk}\left(\frac{f}{f_e \chi}\left(\frac{\xi}{\xi - \psi(\sigma-1)(1-\eta_k)} - 1\right)\right)^{1/\xi}\right)$.

Turning to product entry, the opposite result can be derived by noticing that observed product additions in the market place are partly driven by quality changes of existing plants in addition to new entrants. In particular, equilibrium quality choice is given by $q^*_{ki}=\left(\frac{\alpha\gamma}{\gamma-\delta(\tau_k)}\right)^{1/\theta}\lambda^{\psi_k}_{ki}$, so that in principle all plants have the same incentive to quality upgrade as a result of import tariff cuts $\left(\frac{\partial q^*_{ki}}{\partial\tau_k}<0,\ \text{and}\ \frac{\partial^2 \ln q^*_{ki}}{\partial\tau_k\partial \ln\lambda_{ki}}=0\right)$. Given that in reality 80 percent of barcode products remain unchanged in the store data, it follows that new product additions should on average be characterized by higher positions in the quality distribution observed in 2000. In the next section, I draw on detailed monthly listings of product exit and entry in the store price microdata to test these predictions empirically across the product space.

Finally, I turn to the cost of living consequences of the above relative price effects. Because household quality evaluations (φ_h) are increasing in household income, the consumption baskets of richer households embody higher weighted average product quality than those of poorer households while facing the same prices. Cheaper access to foreign inputs thus gives rise to differences in cost of living inflation across the income distribution. Under two assumptions that the model makes explicit, this effect can be expressed as a function of initial expenditure share differences and price growth across the product space. Following Konus (1939), a household's cost of living index is defined as the ratio of expenditures necessary to reach a reference utility level u^* subject to price vectors at two periods p^{t_0} and p^{t_1}: $\frac{\mathrm{e}(u^*,p^{t1})}{\mathrm{e}(u^*,p^{t0})}$. Denoting a poor and a rich household by subscripts P and R respectively and taking log differences, we get:

Prediction 4: *The relative price effect of input tariff cuts increases real income inequality through differences in cost of living inflation.*

$$\ln\left(\frac{e\left(u^*,p^{t1}\right)}{e\left(u^*,p^{t0}\right)}\right)_P\text{-}\ln\left(\frac{e\left(u^*,p^{t1}\right)}{e\left(u^*,p^{t0}\right)}\right)_R=\sum\nolimits_I\left(s^{t0}_{kiP}-s^{t0}_{kiR}\right)\ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)>0 \tag{10}$$

Within the structure of the model, (10) presents the difference in the exact ideal price index due to input tariff induced changes in the price vector between periods p^{t_0} and p^{t_1}. Two assumptions underlie this convenient result. First, the CES functional form in (1) abstracts from differences in the elasticity of substitution across households. That is, while households are allowed to substitute away from relative price increases (the source of the traditional CPI substitution bias), they do so at the same rate, so that by taking the difference in household cost of living inflation, the second period expenditure shares drop out of the expression. Second, the model abstracts from general equilibrium effects on relative incomes of rich and poor households, which would affect the ideal expenditure weights due to non-homotheticity in (1) (Diewert, 1979). Notice that if in reality either of these assumptions are violated, expression (10) remains a first order approximation to any arbitrary differentiable utility function because

similar to a Laspeyres index it is based on initial differences in budget shares.[32]

To summarize, the theoretical framework guides the empirical estimation in two main ways. First, it yields a set of testable implications on NAFTA's effect on Mexican consumer prices (Predictions 1-3) that I test empirically in the following section. Second, it guides the estimation of the cost of living implications of these relative price changes (Prediction 4) in terms of observable moments in the household consumer surveys in Section 6.

5 NAFTA's Effect on Relative Consumer Prices

This section draws on the store price microdata of the Mexican CPI to empirically test NAFTA's effect on Mexican consumer prices across the quality ladder. First, I test for the average effect of input tariff cuts on the relative price of barcode products with initially higher or lower positions in the unit value distribution within product groups. Second, I test whether the estimated average effect is driven by product groups that are estimated to be vertically differentiated in terms of observable moments in the Mexican plant microdata. Finally, I draw on detailed monthly listings of product entry and exit to test for the effect of input tariff cuts on the reallocation of market shares across quality ladders within product groups.

5.1 NAFTA's Average Effect on Relative Prices within Product Groups

5.1.1 Empirical Strategy

To test for the effect of NAFTA's input tariff cuts on the relative price of initially more expensive relative to less expensive barcode items within product groups in (6), I run the following baseline regression equation:

$$\triangle \ln p_{ick}^{94-00} = \alpha_{ck} + \beta_1 \ln p_{ick}^{94} + \beta_2 \ln p_{ick}^{94} * \mathrm{d}\tau_k^{93-00} + \varepsilon_{ick} \tag{11}$$

$\triangle \ln p_{ick}^{94-00}$ is the log price change of a unique barcode-store combination i in product group k and city c from the third quarter in 1994 to the third quarter in 2000, and $\mathrm{d}\tau_k^{93-00}$ is the weighted average intermediate import tariff change under NAFTA in percentage points across four digit input industries of product group k. α_{ck} indicates city-by-product group fixed effects. Price growth is thus regressed on initial log (per unit) price levels and their interaction with a product group's intermediate input tariff change within city-by-product group cells.[33] The coefficient β_2 captures how the relative price growth of initially higher or lower unit values within city-by-product group cells differs across product groups with higher or lower intermediate import tariff cuts. To address the concern of correlated error terms (ε_{ick}) across

[32] The Online Appendix provides further details on (10), and Section 6 also addresses the concern that while in theory (10) holds exactly, in practice the prices of exiting and entering varieties are not observed in the store price data.

[33] As discussed in the data section, prices are unit prices (price per identical physical units) in the store price surveys.

barcode items in the same product group, standard errors are clustered at the level of 153 product groups.

5.1.2 Baseline Results

Table 1 presents the baseline estimation results. Column 1 reports results before including the interaction of initial log prices with intermediate tariff changes. Store prices within city-by-product group cells appear to have significantly converged in Mexico over the period 1994-2000. This result could be driven by a number of economic stories including trade and the relative price of quality, as well as, for example, the very significant economic crisis that unfolded over this period. Alternatively, $\beta_1<0$ might just be a consequence of measurement error or temporary store price hikes (drops) in the initial period, so that initially high (low) prices within a city-product cell would have a mechanical tendency towards lower (higher) price growth.[34]

Column 2 of Table 1 introduces the product group's tariff interaction of interest. Product groups with higher tariff cuts on their intermediates are characterized by lower relative price growth of initially higher unit values in a statistically significant way. In Column 3 the point estimate of β_2 is unaffected by the inclusion of contemporaneous import and export tariff cuts on final consumer products.[35] The precision of the β_2 estimate slightly increases, while no statistically significant effect of tariff changes on final goods is found. This result is consistent with the minor share of Mexican consumption expenditure on US imported final consumer goods documented in the Online Appendix, and the fact that export tariffs to the US had already been at low levels before NAFTA.

In terms of magnitude, we can compute the effect of a cost reduction in imported intermediates on the relative price changes between two products at different positions of the quality distribution. A one percent cost reduction on all imported intermediates translates into 0.057 percent higher relative price growth for a product with the average price consumed by households at the 25th income percentile compared to a product with the average price consumed by median income households in Figure 3. This effect increases to 0.083 percent higher price growth for a product consumed by households at the 10th income percentile compared to a product consumed by the median income household.

[34]This would be analogous to a case of Galton's fallacy as discussed by Quah (1993) in the context of economic growth rate regressions.

[35]Final good import and export tariff changes correspond to either six or eight digit tariff lines. Data on US applied tariff rates are taken from Feenstra *et al.* (2002).

5.1.3 An Instrumental Variable Strategy for Input Tariff Changes and Additional Robustness Results

The identification of β_2 is based on comparing the relative price growth of barcode items within product groups across product groups that have been exposed to different degrees of intermediate import tariff cuts. By focusing on the within product group dimension of relative price changes, the identifying assumption is that intermediate tariff cuts are not targeted at particular product lines within sectors. Given that tariffs on imported inputs are likely to affect a wide range of domestic producers within and across sectors, this assumption appears plausible *a priori*.

Two potential concerns remain. The first is that tariff cuts could have been targeted at particular product groups in a way that is systematically related to heterogeneous price growth across the initial price distribution. For example, Mexican negotiators could have targeted particular segments of the plant distribution within sectors. The second concern is related to the way that input output coefficients are constructed. In particular, while $d\tau_k^{93-00}$ in equation 11 is aimed to reflect differences in intermediate input tariff changes for the average plant across sectors, IO table information reflect the sums of sectoral output flows. In a setting with heterogeneous firms, this implies that larger plants are weighted more in the measurement of product group specific input requirements. This could give rise to non-traditional measurement error if there are unobserved differences in the input mix of plants: $d\tau_k^{93-00}$ would be measured more accurately for larger, higher price producers within product groups, which could lead to an upward bias of the β_2 coefficient.[36]

To address these remaining concerns, I propose the following two instrumental variable (IV) strategies. The first instrument (IV1 in Table 1) is aimed to address the concern about strategic targeting of input tariffs. In particular, I notice that there is a subset of intermediate sectors, such as basic chemicals, that have significant shares of input use across a wide range of domestic output sectors. Since endogeneity concerns revolve around the strategic targeting of tariff cuts at particular establishments within industries, such concerns are less likely with respect to input categories that are widely shared across the Mexican economy. Guided by this logic, I adjust input-output requirements to sum to 100 percent for each output product group over a subset of one third of intermediate input sectors that have the highest median input requirement coefficients across all four digit destination sectors in the Mexican input output table.[37] I then construct the instrument (IV1) for the total weighted average intermediate

[36] As discussed in the data section, an additional concern with the available Mexican IO table data is that the reported input coefficient for the year 2003 significantly postdate the policy in question. As discussed further below, the second instrument IV2 draws on plant microdata from 1992 and 1993 to address this concern.

[37] The Online Appendix provides an overview of these sectors.

input tariff cut using the weighted average across these commonly shared input categories for each output product group.

The second instrument (IV2) is based on the identical set of most commonly used input sectors as for the first instrument IV1, but is also aimed to address the concern of non-traditional measurement error in conventional IO tables. In particular, I compute the weighted average input tariff changes for each store product group based on input requirement coefficients that I estimate from uniquely rich Colombian plant microdata. These data allow me to observe the input purchases of individual plants to compute requirement coefficients of the average plant within a given product group, rather than plant size weighted averages within a sector. As discussed in the data section, the Colombian plant data also allow me to observe differences in plant technology across product groups during a period preceding the NAFTA policy in Mexico, and they allow for a more disaggregated measurement of input requirements across product groups.

The IV estimation results are reported in Columns 4 and 5 of Table 1. The IV point estimate when using only widely used input sectors to compute input tariff changes (IV1) confirms the sign as well as the size of the OLS estimate of β_2. This finding provides an indication against the concern about endogenous input tariff targeting at particular plants within product groups. The high first stage F-statistic suggests that a large part of the variation in input tariff changes is driven by a subset of widely used input categories, such as basic chemicals, which provides an intuitive explanation for the absence of plant specific tariff targeting in the context of intermediate input tariffs.

The point estimate from the IV estimation when using both the restricted set of widely used inputs and the Colombian input requirement coefficients for the average plant within a product group (IV2) is very slightly higher than the OLS estimate of β_2 and remains statistically significant. This finding suggests that to the extent that non-traditional measurement error is an issue in Columns 2-4, it appears that the greater precision of the product groups available in the Colombian microdata in combination with uncorrelated measurement errors across the two input output data sources jointly dominate this concern.

In a final set of robustness results, I exploit the richness of the Mexican store price microdata in order to report three separate placebo falsification tests, each of which I estimate and report separately for the two IV strategies in Columns 6-11.[38] The columns labeled with Placebo

[38]The Online Appendix also reports additional robustness checks. I re-estimate Columns 2-5 of Table 1 after instrumenting in each regression the initial price position in the third quarter of 1994 with the lagged initial price position in the first quarter of 1994. These results are aimed to address the potential concern that differential degrees of measurement error in initial prices across product groups could be related to variation in input tariff cuts. As reported in the Online Appendix, the reported point estimates are virtually unaffected in these additional estimations.

1 and Placebo 2 report regressions of store price changes during 1989-1993 and during 1994-1995 respectively on NAFTA tariff changes 1993-2000. The first is estimated off price changes during the preceding four year period during which Mexican import tariffs remained practically unchanged (e.g. Kate, 1992). The second is estimated off price changes between the 3rd quarter of 1994 and the first quarter of 1995 which captures the spike of inflation that occurred in Mexico in the immediate aftermath of the Peso crisis in December 1994.[39]

These specifications address two particular concerns. The first is that NAFTA tariff changes might be associated to particular product groups that, in general, are characterized by different price distributional changes across stores and/or barcode items. The fact that the point estimate of β_2 in Columns 6 and 9 are close to zero and insignificant in the preceding period of price changes provides evidence against this concern. Second, tariff changes might have been correlated with product groups whose price distributions were differently affected by the Peso crisis. The fact that the β_2 point estimates in Columns 7 and 10 are close to zero and insignificant provides evidence against this concern.

Finally, Columns 8 and 11 address the concern that the estimated relative price effects within city-by-product group cells could be driven by relative price changes across stores rather than across vertically differentiated products. One particular source of across store relative price changes could be the expansion of modern supermarket chains such as Walmart of Mexico over the period (e.g. Iacovone *et al.*, 2011). This could give rise to bias if product group variation in across store markup consolidation due to Walmart was correlated with intermediate input tariff cuts across product groups.[40] Fortunately, the barcode level product information can be used to estimate a robustness check on this question. Columns 8 and 11 report results after including city-by-barcode fixed effects so that the estimation is restricted to variation across multiple counts of identical barcode items within a city. The fact that no effect is found among identical items provides reassurance against this concern.

5.2 Testing the Heterogeneity of Tariff Effects on Consumer Prices

To test the model's prediction on the heterogeneity of the observed average effect of input tariff changes across different product groups in (7), I extend the baseline specification (11) in the following way:

$$\triangle \ln p_{ick}^{94-00} = \alpha_{ck} + \beta_1 \ln p_{ick}^{94} + \beta_2 \ln p_{ick}^{94} * \mathrm{d}\tau_k^{93-00} + \beta_3 \ln p_{ick}^{94} * \mathrm{Tec}h_k + \beta_4 \ln p_{ick}^{94} * \mathrm{d}\tau_k^{93-00} * \mathrm{Tec}h_k + \varepsilon_{ick} \tag{12}$$

β_1 captures the average relative price growth between product items with initially higher

[39] See Online Appendix for a graphical illustration of this pattern in the price microdata.

[40] This concern is related to the empirical limitation of the store price microdata that store identifiers cannot be observed during the estimation period.

versus lower unit values within city-by-product group cells. β_2 captures the effect of intermediate input tariff cuts on this relative price change among the non-differentiated product groups in the reference category ($Tech_k = 0$). β_3 captures how on average price changes of initially higher and lower unit values differ between non-differentiated and differentiated ($Tech_k = 1$) sectors. The coefficient of central interest, β_4, captures how the relative price effect of intermediate tariff cuts differs in differentiated product groups relative to the non-differentiated reference category. The prediction is that $\beta_4 > 0$.

5.2.1 Estimating Technology Parameters from Plant Microdata

To empirically estimate differences in sectoral scopes for quality differentiation captured by the Tech_k indicator in (7) across the Mexican product space, I follow the model's estimation equation in (8). In particular, I estimate the following specification separately across six digit industries in the 1994 monthly plant surveys in order to parameterize the unit value-sales elasticity in (8):

$$\ln p_{jmkrt} = \alpha_{krt} + \alpha_{kmt} + \beta_k \ln s_{jmkrt} + \varepsilon_{jmkrt} \tag{13}$$

Subscript j indexes a plant-product line combination, m indexes several thousands of manufacturing product groups, k indexes six digit production sectors, r indexes 32 Mexican states, and t indexes 12 months in 1994. $\ln s_{jmkrt}$ are log monthly sales of different product lines within a plant. For each six digit sector, log monthly output unit values are thus regressed on product group-by-month fixed effects, state-by-month fixed effects, and the product line's log sales.

Following from (8), the β_k coefficient yields an estimate of $\left(\frac{1}{\sigma-1}\frac{\eta_k}{1-\eta_k}\right)$, either pooled across all product groups, or estimated individually for each six digit manufacturing sector. To address the concern of correlated error terms within the same product category, standard errors are clustered at the level of m product groups.[41] Finally, following Deaton (1988), both unit values on the left hand side and sales on the right embody measurement error in prices. To address the concern of non-traditional measurement error, I follow Kugler and Verhoogen (2012) and instrument for a product line's log monthly sales by the log of the establishment's employment in 1994.

To distinguish differentiated sectors where initial unit values in 1994 are significantly positively related to product quality and quality adjusted productivity, and non-differentiated sectors where no such relationship is observed, I estimate the model's equation (7) separately for each six digit sector and define a binary identifier variable Tech_k which takes the value 1 if β_k is statistically significantly positive at the 10 percent level. Given the concern of non-

[41] This yields slightly higher standard errors than clustering at the plant level instead.

traditional measurement error discussed above, I follow Kugler and Verhoogen (2012) and estimate this cut-off for each sector on the basis of the unit value-employment elasticities. As reported in more detail in the Online Appendix, this cut-off identifies about one third of processed tradable household consumption as differentiated.

The model relates differences in the magnitude of the unit value-plant size elasticity to the scope for differentiation captured by the parameter ψ_k. As a robustness check I follow Kugler and Verhoogen (2012) and verify to what extent the technology estimates are related to existing "off-the-shelf" measures of vertical differentiation in statistically significant way. As reported in detail in the Online Appendix, this is indeed very clearly and statistically significantly the case.

5.2.2 Results and Robustness

The plant data estimates suggest that product groups significantly differ in the degree to which observed unit values in 1994 are related to differences in quality and plant technologies. These estimated technology parameters allow me to test for the heterogeneity of the tariff effect by estimating specification (12). The results reported in Table 2 confirm the model's second prediction. In particular, the first interaction term $\left(\beta_2\right)$ in (12) becomes statistically insignificant, indicating that the previously estimated average effect of intermediate import access on within product group store prices in Table 1 is indeed driven by differentiated product groups $\left(\beta_4>0\right)$.[42]

The point estimate of β_4 is confirmed in size and statistical significance in Column 2 when instrumenting for intermediate input tariff cuts using the weighted average input tariff cut across input sectors with high median requirement coefficients (IV1). The same holds after additionally adjusting for the concern of non-traditional measurement error in the sector level Mexican input output coefficients by using the Colombian plant microdata estimates (IV2). Finally, Columns 4-9 report the identical set of robustness tests as discussed for the average tariff effect in Table 1. In particular, the point estimate of β_4 becomes close to zero and statistically insignificant when estimated off price changes in the preceding period or price changes in the immediate aftermath of the Peso crisis. The estimates using only relative price variation across identical barcode items become very imprecise and are nowhere close to statistically significant, suggesting that this dimension of relative price movements are not driving the estimated effects in Columns 1-3.

5.3 Testing for Reallocation Effects Using Product Entry and Exit

Finally, to test for the effect of tariff cuts on the reallocation of market shares across the quality ladder stated in (9), I draw on detailed monthly records of product additions and replacements

[42]Bootstrapping standard errors to adjust for the fact that the product group differentiation dummy is itself an empirical estimate does not affect the reported significance level.

in the central bank store price microdata. In particular, I estimate conditional logit and linear probability specifications of the form:

$$E_{ikc}^{94-00} = \alpha_{ck} + \beta_1 \ln p_{ick}^t + \beta_2 \ln p_{ick}^t * \mathrm{d}\tau_k^{93-00} + \beta_3 \ln p_{ick}^t * \mathrm{Tech}_k + \beta_4 \ln p_{ick}^t * \mathrm{d}\tau_k^{93-00} * \mathrm{Tech}_k + \varepsilon_{ick} \quad (14)$$

E_{ikc}^{94-00}indicates either $\mathrm{Entry}_{ikc}^{94-00}$ or $\mathrm{Exit}_{ikc}^{94-00}$, which are binary indicators of reported product additions or disappearances over the period 1994-2000 respectively. Superscript t indicates the third quarter in 1994 when the dependent variable is $\mathrm{Exit}_{ikc}^{94-00}$, and the third quarter in 2000 when the dependent variable is $\mathrm{Entry}_{ikc}^{94-00}$. Exit propensities are thus estimated as a function of initial unit value positions, whereas entry propensities are estimated as a function of unit value positions in 2000.

Tables 3 and 4 report estimation results for product additions and product exit respectively. The results provide some empirical support for the model's predictions on market share reallocations towards the higher end of the quality spectrum. While for both entry and exit regressions, the average effect of tariff cuts across all product groups is not statistically significant in the linear probability IV specifications, the tariff effect is significant and of expected opposite signs for both product entry and exit among differentiated product groups.[43] Among differentiated product groups, higher intermediate tariff cuts thus appear to have increased the propensity of exit at the lower end of the initial price distribution, whereas they increased the entry propensity at the higher end of the price distribution in 2000.

6 NAFTA's Effect on Cost of Living Inflation across the Income Distribution

The previous section has drawn on the CPI microdata to present evidence of NAFTA's effect on relative consumer prices. This section draws on household consumption microdata to evaluate the cost of living implications of the observed store price effects across the income distribution. As mentioned in the data section, the analysis draws on the fact that the Mexican microdata allow me to observe the position of individual household purchases in the product unit value distribution during the same period, within the same product groups, and for the same set of locations as those observed in the store price estimations of the previous section.

6.1 Empirical Strategy

The cost of living expression in (10) requires information on differences in initial household expenditure shares across products in 1994 in combination with trade induced relative price changes. The empirical strategy combines observed expenditure shares linked to purchase unit values in the household consumption surveys of 1994 with the causal estimate of NAFTA's

[43]The lack of significant results on the average effect across all product groups is probably not surprising when taking into account the nature of the data. Instead of scanner data, the Mexican microdata on product exit and entry are recorded in monthly store surveys by individual enumerators.

relative price effect within product groups estimated from the store price panels. The observed expenditure shares reported for individual purchases allow me to estimate the first term on the right hand side of (10), while the linked unit values allow me to estimate trade induced relative price changes in the second term as a function of an item's position in the unit store price distribution in the third quarter of 1994. Intuitively, the estimation strategy combines the expenditure weighted household unit value differences depicted in Figure 3 with the estimated effect of tariff changes on relative store prices presented in Tables 1 and 2.[44]

It is apparent from (10) that this estimation strategy is subject to bias if errors in estimated trade induced relative price growth are correlated with expenditure share differences between the rich and the poor across product items.[45] The particular concern that arises is that part of the observed unit value differences between rich and poor households depicted in Figure 3 could be driven by price differences across identical items due to rich people consuming at more expensive stores. In that case, the predicted price changes derived from store price regressions are based on initial store unit value differences in 1994 that reflect quality differentiation, whereas observed price differences between rich and poor households could simply reflect differences in store markups of identical items. The resulting bias would lead to an over-estimate of NAFTA's true implication on differences in household cost of living inflation for the poor relative to the rich.[46]

Fortunately, the Mexican consumer surveys contain information that can be used to estimate a robustness test with respect to this concern. In particular, the surveys report point of purchase types (street vendors, markets, convenience and specialized stores, supermarkets and department stores) alongside household expenditures and product unit values. Table 5 reports regressions of log purchase unit values on household income per capita quintile dummies both before and after including city-by-product-by store type fixed effects. If store markups were driving unit value differences, then one would expect the inclusion of store type fixed effects

[44]For some product groups common physical units are hard to define. As described in the data section, the consumer surveys report unit values for food products, beverages, and tobacco products. Out of the 255 processed tradable product groups, 118 report unit values. I assign the weighted average household mean unit value deviation to household expenditures with missing unit information, where the weights reflect the share of household expenditures across product groups with reported unit values. This strategy is likely conservative as the 118 product groups are estimated to be on average less differentiated in the plant microdata. In confirmation of this argument, regression results in the Online Appendix show that product groups that are estimated to have higher scopes for quality differentiation in the plant microdata have statistically significantly higher estimated unit purchase value gaps between rich and poor households in the consumption surveys.

[45]Formally, from (10) we get:
$\left(\sum_I \left(s^{t0}_{kiP} - \widehat{s^{t0}_{kiR}}\right) ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)\right) = \sum_I \left(s^{t0}_{kiP} - s^{t0}_{kiR}\right)\left(ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right) + \epsilon_{ki}\right) = \sum_I \left(s^{t0}_{kiP} - s^{t0}_{kiR}\right) \ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)$
$+ N_I \mathrm{Cov}\left(\left(s^{t0}_{kiP} - s^{t0}_{kiR}\right), \epsilon_{ki}\right)$, where $\epsilon_{ki} = \left(\widehat{ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)} - ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)\right)$.

[46]Formally, this would imply a positive correlation between expenditure share differences and prediction errors of relative price growth expressed in (10): $\mathrm{Cov}\left(\left(s^{t0}_{kiP} - s^{t0}_{kiR}\right), \epsilon_{ki}\right) > 0$, where $\epsilon_{ki} = \left(\widehat{ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)} - ln\left(\frac{p^{t1}_{ki}}{p^{t0}_{ki}}\right)\right)$.

to significantly reduce the estimated price gap across income quintiles. The fact that the estimated unit value differences slightly increase due to the inclusion of store type fixed effects in Column 2 provides evidence against this concern.[47] Several explanations for this finding have been advocated, including the cost of mobility to reach cheaper stores or bulk discounting (Caplovitz, 1963).

Finally, an additional empirical challenge in estimating expression (10) concerns the effects of input tariff cuts on cost of living through product exit and entry across the quality distribution. In theory (10) holds exactly. In practice, however, price changes of exiting and entering varieties are not observed in the data. We know from existing work that product exit and entry matter for the measurement of aggregate inflation over time (e.g. Feenstra, 1994). In the current context, price changes at the extensive margin matter to the extent that input tariff cuts have a *different* effect on differences in cost of living that is not already captured by assigning a 100 percent weight to the price changes of persistent varieties observed in (10). That is, in the current empirical setting unobserved trade induced price changes give rise to estimation concerns to the extent that they affect differences in cost of living inflation between rich and poor households qualitatively or quantitatively differently than the observed relative price effects among persistent products.

The model has the convenient feature that it makes no such prediction. In particular, expression (10) can be re-written as a covariance term between differences in initial expenditure shares and trade induced relative price changes across varieties within product groups.[48] In the model, this covariance term is identical when estimated off persistent product varieties (80 percent in the initial store price microdata), compared to an estimation that would include unobserved price changes of exiting and entering products. The reason is that the price of quality effect of input tariff cuts in (6) does not feature non-linearities across the quality distribution.

That is, while the model in Prediction 4 implies that poor households are affected more by trade induced product exit at the lower end of the quality distribution, and benefit less from trade induced product entry at the higher end, this effect is identical to the relative price effect measured among persistent products. In theory, assigning a 100 percent weight to observed price changes in (10) captures the full effect. To the extent that these convenient assumptions

[47] This finding is consistent with results reported in Broda *et al.* (2009) using US barcode homescanner data. While their paper's main conclusion is that on average poorer US households consume at slightly lower prices compared to richer households (defined by incomes above US$ 60,000 in 2005), Figure 2 of their paper shows that this finding is reversed over the real income range reported in Mexican consumer surveys.

[48] (10) can be written as $I*Cov\left(\left(s^{t\tilde{0}}_{kiP}-s^{t\tilde{0}}_{kiR}\right),\left(ln\left(\frac{p^{t1}_{ki}}{p^{t\tilde{0}}_{ki}}\right)-\overline{ln\left(\frac{p^{t1}_{ki}}{p^{t\tilde{0}}_{ki}}\right)}^{k}\right)\right)$, where I is the number of all varieties across all product groups, and $\tilde{s^{t0}_{ki}}$ are initial budget shares which sum to 100 percent within each product group.

are violated in reality, the presented analysis would not be able to capture the differential cost of living effects at the extensive margin of the product space. The empirical limitation underlying this is that household consumption panel data -which in principle could be used to estimate both initial and second period expenditure differences- are not available as part of the Mexican expenditure surveys described in Section 2.

6.2 Baseline Estimation

Figure 4 proceeds to present the baseline estimation results of the household price index effect on total tradable consumption of a 12 percentage point US import tariff cut (average of NAFTA tariff cuts 1993-2000) across the urban Mexican income distribution in 1994.[49] The baseline results are based on observed deviations of household purchase unit values from municipality-by-product-by-store type means in combination with the preferred estimate of NAFTA's average relative price effect reported in Column 5 of Table 1.

Table 6 presents the same estimates after collapsing the data to mean outcomes across five nominal income quintiles subject to nationally representative household survey weights. The reported result is that the average tariff cut under NAFTA has led to a 2.6 percentage point increase in tradable consumption inflation of the poorest quintile of urban Mexican households compared to the richest quintile.[50]

6.3 Accounting for Product Group Heterogeneity

Because the estimation results in Figure 4 are based on the average store price effect of tariff cuts across product groups in Table 1, the implicit assumption is that all product groups are characterized by the same average scope for quality differentiation. Following from the plant data technology estimates and the heterogeneity of NAFTA's store price effects, this assumption does not hold in the data.

How does the observed product group heterogeneity affect the estimation results in Figure 4? In this subsection, I report two alternative estimations which are based on different assumptions about what the observed price differences between rich and poor households within municipality-by-product-by-store type cells measure in terms of differences in product quality choices. The underlying empirical challenge that these exercises are aimed to address is that

[49] As reported in the Online Appendix, total tradable (i.e. non-services) household consumption accounts for on average 54 percent of Mexican household consumption in 1994. The store price estimation sample covers processed tradables which account for 70% of total tradable consumption. The reported estimation results are scaled to total tradable consumption, under the arguably conservative assumption that no relative price of quality effects occur among tradable products outside the estimation sample.

[50] Figure 4 and Table 6 are based on municipalities with at least 10 sampled households that include households in both the poorest and richest income quintiles. This is to assure that estimates are based on meaningful within municipality variation in purchase unit values. As reported, this reduces the full urban household sample from 7632 to 6328. To confirm that this restriction does not lead to unrepresentative estimates, we can compare the reported baseline estimate of 2.6 percentage points (standard error of 0.33) to the same estimate when using the full sample of municipalities, which is 2.5 percentage points (standard error of 0.29).

product market shares are observable in combination with unit values (to estimate quality) only in the plant microdata, while neither the store price microdata, nor the consumption surveys report product barcodes alongside market shares and unit values.

The first approach is based on the conservative assumption that the observed unit value differences between rich and poor households only reflect differences in product quality choices, and thus differences in imported value shares, in product groups in which it is also true that prices are correlated strongly enough with product quality to estimate a statistically significant scope for quality differentiation ($\eta_k > 0, Tech_k = 1$) in the plant microdata. That is, we assume that any effect on the relative price of quality is only present in sectors in which we are able to proxy for product quality with unit value differences in the plant data. This approach thus applies the estimated store price effect in Column 3 of Table 2 only to those product groups that are estimated to be differentiated in the plant microdata. Since the plant data estimates identify only around 30 percent of consumer product groups as quality differentiated in this respect, I refer to this estimation approach as a lower bound estimate of NAFTA's true effect on differences in cost of living inflation across the Mexican income distribution.

The second approach is based on the opposite assumption that price differences between the rich and the poor within municipality-by-product-by-store type reflect differences in quality choices across all 255 sample product groups, despite the fact that the relationship between unit values and quality might not be strong enough to be captured in the plant production or store price microdata. The argument is that the plant and store price data include price variation across the full product space, whereas product purchase variation between the rich and poor households within the same store types is more informative to capture quality differences. This approach thus applies the estimated store price effect among differentiated sectors in Table 2 to observed household consumption price differences across all processed tradable product groups. In the estimation results reported below, I refer to this as an upper bound estimate of NAFTA's effect on differences in tradable household cost of living inflation.

Table 6 presents these estimations after collapsing the data to mean outcomes across five nominal income quintiles subject to nationally representative household survey weights, and the Online Appendix presents additional graphs. The lower bound estimate suggests that NAFTA caused a 1.4 percentage point higher cost of living inflation for the poorest income quintile compared to the richest over the period 1994-2000. The upper bound estimate of this effect is 4.4 percentage points. As expected, these alternative estimation approaches fall on different sides of the baseline estimate of 2.6 percentage points.

In terms of magnitude and direction, these findings can also be related to the observed increase in total nominal income inequality among the identical set of households over the same

period. In particular, NAFTA's estimated effect on differences in cost of living inflation appears to have reinforced the observed increase in nominal income inequality, and is equivalent to approximately 25 percent (lower bound) to 55 percent (upper bound) of the observed differences in nominal income growth between the richest and the poorest urban income quintiles over the period 1994-2000.[51]

7 Conclusion

The question of how globalization affects real income inequality in developing countries has been a prominent policy subject in the study of international trade. This paper contributes to the existing literature on this question by considering product quality differentiation as a channel that links differences in the consumption baskets of rich and poor households to differences in imported value shares in production. The paper draws on a unique collection of Mexican microdata in combination with a new empirical strategy to quantify this channel empirically in the context of NAFTA in Mexico.

The analysis presents evidence in favor of the hypothesis that access to imported intermediates from developed countries reduces the relative price of higher quality products in a developing country. In turn, because quality choices differ across the income distribution, this relative price effect appears to have significantly increased real income inequality in urban Mexico due to NAFTA over the period 1994-2000. The findings suggest that NAFTA's effect on household cost of living has reinforced the observed increase in nominal income inequality among the identical set of households over the same period in a statistically and economically significant way.

For policy analysis, the presented findings serve to highlight the importance of price index effects in addition to the conventional focus on nominal incomes when analyzing the general equilibrium consequences of a policy or market shock for the distribution of real incomes. In this respect, the paper points to a number of interesting unanswered research questions concerning, for example, the cost of living implications of globalization in other developing and developed country contexts, and the price index effects of other policies, such as transport infrastructure or retail sector entry (de-)regulation, in both developing and developed economies.

References

Amiti, M., & Konings, J. (2007). Trade liberalization, intermediate inputs, and productivity: Evidence from Indonesia. *The American Economic Review*, 1611–1638.

[51] I estimate nominal income growth differences from mean incomes by quintile in 1994 and 2000 using the identical household sample and population weights as in the cost of living estimations reported above. The difference in nominal income growth rates between the richest and the poorest income quintiles is 4.4 percentage points over the period. The stated comparison adjusts for the fact that tradable consumption accounts for only 54 percent of total consumption in 1994.

Attanasio, O., & Binelli, C. (2010). Mexico in the 1990s: The main cross-sectional facts. *Review of Economic Dynamics*, *13*(1), 238–264.

Brambilla, I., Dix-Carneiro, R., Lederman, D., & Porto, G. (2012). Skills, exports, and the wages of seven million Latin American workers. *The World Bank Economic Review*.

Broda, C., Leibtag, E., & Weinstein, D. (2009). The role of prices in measuring the poor's living standards. *The Journal of Economic Perspectives*, *23*(2), 77–97.

Broda, C., & Romalis, J. (2008). Inequality and prices: Does China benefit the poor in America? *University of Chicago mimeo*.

Caplovitz, D., & of Applied Social Research, C. U. B. (1963). *The poor pay more: Consumer practices of low-income families*. Free Press of Glencoe.

Caron, J., Fally, T., & Markusen, J. R. (2012). Skill premium and trade puzzles: A solution linking production and preferences. *NBER Working Paper*.

Choi, Y., Hummels, D., & Xiang, C. (2009). Explaining import quality: The role of the income distribution. *Journal of International Economics*, *78*(2), 293–303.

Deaton, A. (1988). Quality, quantity, and spatial variation of price. *The American Economic Review*, 418–430.

Deaton, A. (1989). Rice prices and income distribution in Thailand: A non-parametric analysis. *The Economic Journal*, *99*(395), 1–37.

Deaton, A. (2003). Prices and poverty in India, 1987-2000. *Economic and Political Weekly*, 362–368.

Diewert, W. (1979). *The economic theory of index numbers: A survey*. Department of Economics, University of British Columbia.

Fajgelbaum, P., & Khandelwal, A. (2013). Measuring the unequal gains from trade. *UCLA mimeo*.

Feenstra, R., & Romalis, J. (2013). International prices and endogenous quality. *UC Davis mimeo*.

Feenstra, R., Romalis, J., & Schott, P. (2002). *Us imports, exports, and tariff data, 1989-2001* (Tech. Rep.). National Bureau of Economic Research.

Feenstra, R. C. (1994). New product varieties and the measurement of international prices. *The American Economic Review*, 157–177.

Fieler, A. (2011). Nonhomotheticity and bilateral trade: Evidence and a quantitative explanation. *Econometrica*, *79*(4), 1069–1101.

Gagnon, E. (2009). Price setting during low and high inflation: Evidence from Mexico. *The Quarterly Journal of Economics*, *124*(3), 1221.

Goldberg, P., Khandelwal, A., Pavcnik, N., & Topalova, P. (2010). Imported intermediate inputs and domestic product growth: Evidence from India. *The Quarterly Journal of Economics*, *125*(4), 1727–1767.

Goldberg, P., & Pavcnik, N. (2005). Trade, wages, and the political economy of trade protection: Evidence from the Colombian trade reforms. *Journal of International Economics*, *66*(1), 75–105.

Goldberg, P., & Pavcnik, N. (2007). Distributional effects of globalization in developing countries. *Journal of Economic Literature*, *45*, 39–82.

Goldin, C., & Katz, L. (2008). *The race between education and technology*. Harvard University Press.

Hallak, J. (2006). Product quality and the direction of trade. *Journal of International Economics*, *68*(1), 238–265.

Halpern, L., Koren, M., & Szeidl, A. (2011). Imports and productivity. *Central European University mimeo*.

Handbury, J. (2012). Are poor cities cheap for everyone? Non-homotheticity and the cost of living across US cities. *Columbia University mimeo*.

Hufbauer, G., & Schott, J. (1992). *North American free trade: Issues and recommendations*. Peterson Institute.

Iacovone, L., Javorcik, B. S., Keller, W., & Tybout, J. R. (2011). Supplier responses to Wal-Mart's invasion of Mexico. *NBER Working Paper*.

Iacovone, L., Rauch, F., & Winters, L. (2010). *Trade as an engine of creative destruction: Mexican experience with Chinese competition*. London school of economics and political science (LSE). Centre for economic performance (CEP).

INEGI. (2000). Sintesis metodologica de la encuesta industrial anual. *Instituto Nacional de Estadistica, Geographia, e Informatica*.

Johnson, R. (2012). Trade and prices with heterogeneous firms. *Journal of International Economics*.

Kate, A. (1992). Trade liberalization and economic stabilization in Mexico: Lessons of experience. *World Development*, *20*(5), 659–672.

Konüs, A. (1939). *The problem of the true index of the cost of living*.

Kugler, M., & Verhoogen, E. (2009). Plants and imported inputs: New facts and an interpretation. In *American economic review papers and proceedings* (Vol. 99, pp. 501–507).

Kugler, M., & Verhoogen, E. (2012). Prices, plant size, and product quality. *Review of Economic Studies*, *Forthcoming*.

López-Córdova, J. (2002). NAFTA and Mexico's manufacturing productivity: An empirical investigation using micro-level data. *Inter-American Development Bank Working Paper). IDB, Washington, DC*.

Manova, K., & Zhang, Z. (2012). Export prices across firms and destinations. *The Quarterly Journal of Economics*, *127*(1), 379–436.

Melitz, M. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, *71*(6).

Moretti, E. (2013). Real wage inequality. *American Economic Journal: Applied Economics*, *5*(1), 65–103.

Muellbauer, J. (1974). Prices and inequality: The United Kingdom experience. *The Economic Journal*, *84*(333), 32–55.

Porto, G. (2006). Using survey data to assess the distributional effects of trade policy. *Journal of International Economics*, *70*(1), 140–160.

Quah, D. (1993). Galton's fallacy and tests of the convergence hypothesis. *The Scandinavian Journal of Economics*, 427–443.

Slaughter, M. (1998). What are the results of product-price studies and what can we learn from their differences? *National Bureau of Economic Research Working Paper*, *No 6591*.

Sutton, J. (1998). *Technology and market structure: Theory and history*. The MIT Press (Cambridge, Mass).

Topalova, P. (2010). Factor immobility and regional impacts of trade liberalization: Evidence on poverty from India. *American Economic Journal: Applied Economics*, *2*(4), 1–41.

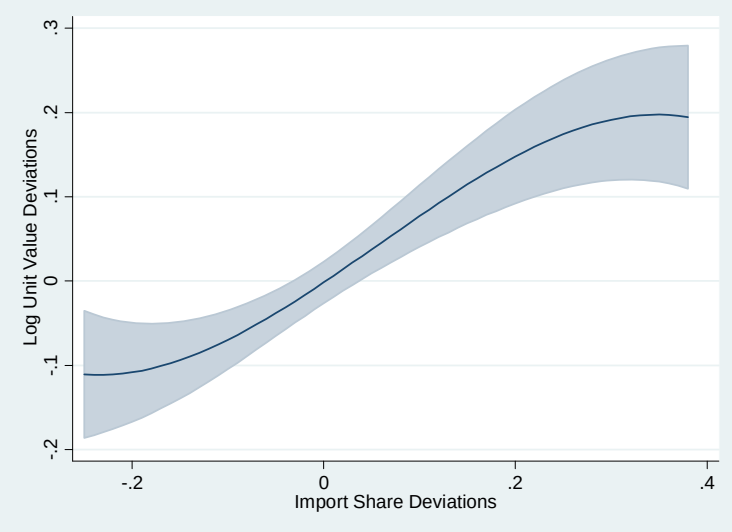
Trefler, D. (1995). The case of the missing trade and other mysteries. *The American Economic Review*, 1029–1046.

Verhoogen, E. (2008). Trade, quality upgrading, and wage inequality in the Mexican manufacturing sector. *The Quarterly Journal of Economics*, *123*(2), 489–530.

8 Figures and Tables

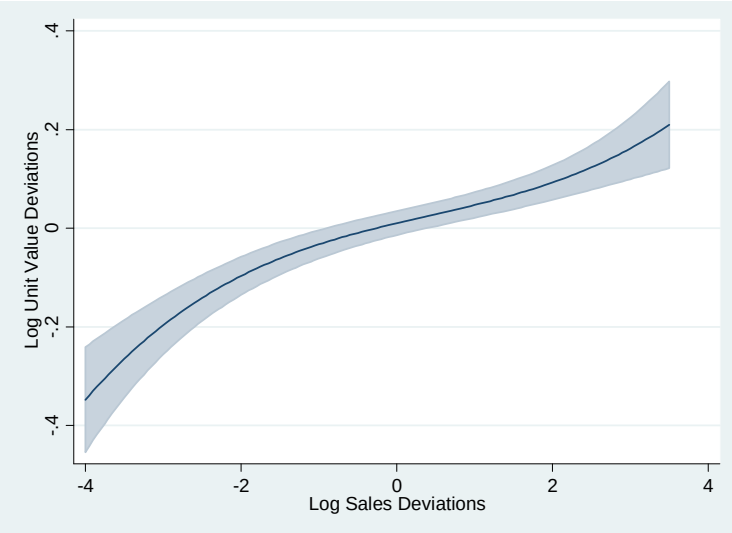
8.1 Figures

Figure 1: Plant Product Line Unit Values and Imported Input Shares in 1994



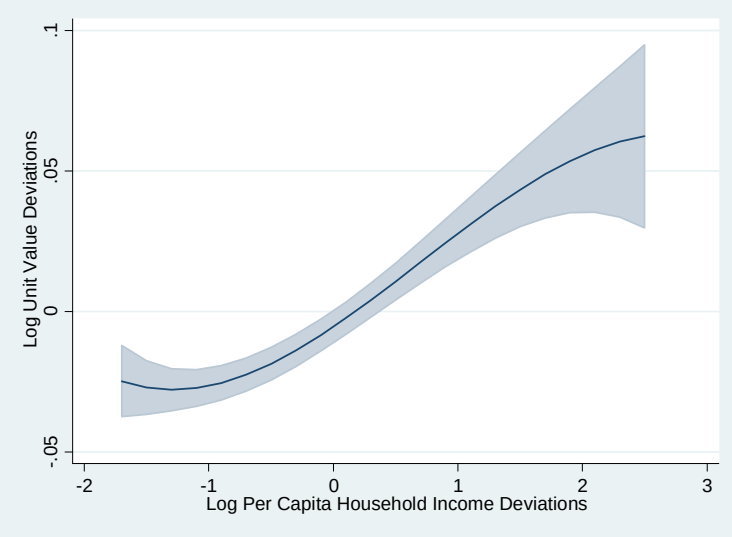
The fitted relationship corresponds to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). Standard errors are clustered at the product level and the shaded area indicates 95% confidence intervals. The y-axis depicts the residuals of a regression of log monthly product line unit values on month-by-product and month-by-state fixed effects. Estimations are based 2615 plants in 78 six digit final good manufacturing sectors and 1000 products over 12 months in 1994. The number of observations in this regression is 92464. The x-axis depicts the residuals of a regression of annual 1994 plant level imported input shares on product and state fixed effects. The number of observations in this regression is equal to the number of unique product lines (8924). The bottom and top 0.5% on the x-axis are excluded from the graph.

Figure 2: Plant Product Line Unit Values and Product Market Shares in 1994



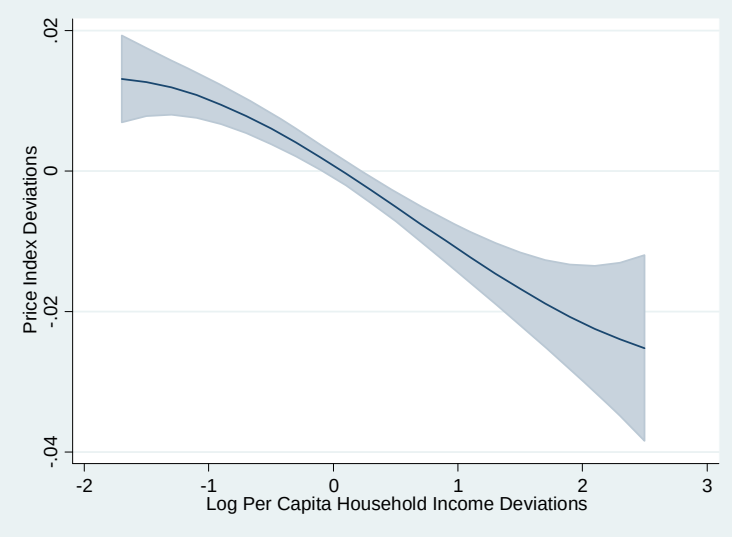
The fitted relationship corresponds to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). Standard errors are clustered at the product level and the shaded area indicates 95% confidence intervals. The y-axis and the x-axis depict the residuals of two regressions of log product-line unit values or log product line sales on month-by-product and month-by-state fixed effects. Estimations are based 2615 plants in 78 six digit final good manufacturing sectors and 1000 products over 12 months in 1994. The number of observations for both axes is 92464. The bottom and top 0.5% on the x-axis are excluded from the graph.

Figure 3: Household Purchase Unit Values and Household Income in 1994



The fitted relationship corresponds to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). Standard errors are clustered at the municipality level and the shaded area indicates 95% confidence intervals. Estimations are based on 7764 urban households across 236 municipalities in Mexico and 255 processed tradable product groups. The y-axis depicts the residuals of a regression of log unit purchase values on municipality-by-product-by-store type fixed effects. These residuals are then averaged at the household level using reported expenditure weights. The x-axis depicts mean deviations of log household per capita incomes. Estimations are weighted by nationally representative sample weights. The bottom and top 0.5% on the x-axis are excluded from the graph.

Figure 4: Cost of Living Effect of Average NAFTA Import Tariff Cut 1994-2000



The fitted relationship corresponds to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). Standard errors are clustered at the municipality level and the shaded area indicates 95% confidence intervals. The y-axis depicts mean deviations of estimated household cost of living inflation of tradable consumption due to a 12% tariff cut on US imports. These estimates are based on the average effect of input tariff cuts in Column 5 of Table 1. The x-axis depicts mean deviations of log household per capita incomes. Estimations are based on urban Mexican households in 1994 and subject to nationally representative sample weights. The bottom and top 0.5% on the x-axis are excluded from the graph.

8.2 Tables

Table 1: Testing the Average Effect of Input Tariffs on Mexican Store Prices 1994-2000

Dependent Variable: Change ln(Store Price) 1994-00	(1) OLS	(2) OLS (Baseline)	(3) OLS (Controls)	(4) IV1 (Most used inputs)	(5) IV2 (Most used inputs & Colombian IO data)	(6) IV1 Placebo 1 1989-93	(7) IV1 Placebo 2 1994-95	(8) IV1 Placebo 3 Barcode FX	(9) IV2 Placebo 1 1989-93	(10) IV2 Placebo 2 1994-95	(11) IV2 Placebo 3 Barcode FX
ln(Store Price 1994)	-0.196***	0.237	0.226	0.242	0.274	-0.0999	-0.0275	-0.602	-0.0115	0.0660	-0.450
	(0.0264)	(0.251)	(0.245)	(0.249)	(0.279)	(0.133)	(0.229)	(0.865)	(0.0457)	(0.0665)	(1.138)
ln(Store Price 1994)* Change Intermed Imp Tariff 93-00		0.0436*	0.0495**	0.0442*	0.0474*	0.00283	0.0101	0.00892	0.00306	0.0109	0.0239
		(0.0254)	(0.0249)	(0.0254)	(0.0277)	(0.0116)	(0.0226)	(0.0826)	(0.00422)	(0.00679)	(0.112)
ln(Store Price 1994)* Change Export Tariff 93-00			-0.00210								
			(0.00205)								
ln(Store Price 1994)* Change Final Imp Tariff 93-00			-0.0113								
			(0.00819)								
City Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
City-By-Product Group FX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
City-By-Barcode FX	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✓
Obs	13,545	13,545	13,545	13,545	13,545	11,728	13,545	13,545	11,728	13,545	13,545
1st Stage F-Stat				73.40	54.96	38.22	73.40	60.56	32.62	54.96	7.31
N(Product Groups)	153	153	153	153	153	153	153	153	153	153	153
Within-R^2	0.097	0.105	0.108								

All regressions include city-by-product group fixed effects. Intermediate tariff changes are weighted averages in percentage points, where weights are input requirement coefficients across four digit sectors of the Mexican IO table. Instrumental variable results are 2nd stage IV estimates after instrumenting for input tariff changes. The first instrument is based on the weighted average tariff changes of the 30% of input sectors with the highest median input requirement across output sectors in the Mexican IO table. The second instrument is based on the same restricted set of input sectors, but uses the average plant input requirement coefficient computed from the Colombian plant microdata for 1992 and 1993. Standard errors are clustered at the level of 153 final product groups. ***1%, **5%, and *10% significance levels.

Table 2: Testing the Heterogeneity of Tariff Effects

Dependent Variable: Change ln(Store Price) 1994-00	(1) OLS	(2) IV1 (Most used inputs)	(3) IV2 (Most used inputs & Colombian IO data)	(4) IV1 Placebo 1 1989-1993	(5) IV1 Placebo 2 1994-1995	(6) IV1 Placebo 3 Barcode FX	(7) IV2 Placebo 1 1989-1993	(8) IV2 Placebo 2 1994-1995	(9) IV2 Placebo 3 Barcode FX
ln(Store Price 1994)	0.0513	0.0169	-0.115	-0.0979	-0.116	-1.208**	-0.0518	0.0731	0.729
	(0.209)	(0.209)	(0.377)	(0.177)	(0.318)	(0.528)	(0.0466)	(0.109)	(4.309)
ln(Store Price 1994)*									
Change Intermed Imp Tariff 93-00	0.0234	0.0199	0.00651	0.00275	0.000940	-0.0497	-0.000659	0.0120	0.144
	(0.0205)	(0.0204)	(0.0380)	(0.0149)	(0.0319)	(0.0521)	(0.00412)	(0.0113)	(0.432)
ln(Store Price 1994)*									
Differentiated Prod Dummy	0.823**	0.792**	0.809*	0.0450	0.240	1.199	0.115	0.0178	-0.940
	(0.347)	(0.363)	(0.479)	(0.332)	(0.419)	(1.586)	(0.0980)	(0.138)	(4.653)
ln(Store Price 1994)*									
Change Intermed Imp Tariff 93-00*									
Differentiated Prod Dummy	0.0865**	0.0835**	0.0857*	0.00557	0.0252	0.112	0.0101	0.000213	-0.102
	(0.0341)	(0.0356)	(0.0479)	(0.0312)	(0.0419)	(0.146)	(0.00905)	(0.0139)	(0.462)
City Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
City-By-Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
City-By-Barcode FX	✗	✗	✗	✗	✗	✓	✗	✗	✓
Obs	13,545	13,545	13,545	11,728	13,545	13,545	11,728	13,545	13,545
1st Stage F-Stat		31.98	10.80	24.98	31.98	4.69	7.46	10.80	0.18
N(Product Groups)	153	153	153	153	153	153	153	153	153
Within-R^2	0.112								

All regressions include city-by-product group fixed effects. Intermediate tariff changes are weighted averages in percentage points, where weights are input requirement coefficients across four digit sectors of the Mexican IO table. Instrumental variable results are 2nd stage IV estimates after instrumenting for input tariff changes. The first instrument is based on the weighted average tariff changes of the 30% of input sectors with the highest median input requirement across output sectors in the Mexican IO table. The second instrument is based on the same restricted set of input sectors, but uses the average plant input requirement coefficient computed from the Colombian plant microdata for 1992 and 1993. Standard errors are clustered at the level of 153 final product groups. ***1%, **5%, and *10% significance levels. Standard errors are clustered at the level of 153 final product groups. ***1%, **5%, and *10% significance levels.

Table 3: Testing Reallocation Effects: Product Additions

Dependent Variable: Product Addition 1994-00	(1) C-Logit	(2) Linear Probability OLS	(3) Linear Probability IV1	(4) Linear Probability IV2	(5) C-Logit	(6) Linear Probability OLS	(7) Linear Probability IV1	(8) Linear Probability IV2
ln(Store Price 2000)	0.0998	0.0173	-0.0225	-0.121	1.609*	0.249	0.327	0.366
	(0.864)	(0.154)	(0.210)	(0.373)	(0.974)	(0.172)	(0.244)	(0.507)
ln(Store Price 2000)* Change Intermed Imp Tariff 93-00	0.00993	0.00172	-0.00222	-0.0120	0.168*	0.0262	0.0340	0.0379
	(0.0828)	(0.0144)	(0.0208)	(0.0390)	(0.0949)	(0.0160)	(0.0240)	(0.0534)
ln(Store Price 2000)* Differentiated Prod Dummy					-4.677**	-0.855**	-1.167***	-1.242*
					(1.874)	(0.347)	(0.432)	(0.637)
ln(Store Price 2000)* Change Intermed Imp Tariff 93-00* Differentiated Prod Dummy					-0.480***	-0.0885***	-0.119***	-0.126*
					(0.178)	(0.0328)	(0.0416)	(0.0653)
City Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
City-By-Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Obs	19,537	19,537	19,537	19,537	19,537	19,537	19,537	19,537
1st Stage F-Stat			223.03	40.26			76.90	8.80

The dependent variable is a zero/one identifier for whether the product was added to the store sample between 1994-2000. All specifications include city-by-product group fixed effects.Intermediate tariff changes are weighted averages in percentage points, where weights are input requirement coefficients across four digit sectors of the Mexican IO table. Instrumental variable results are 2nd stage IV estimates after instrumenting for input tariff changes. The first instrument is based on the weighted average tariff changes of the 30% of input sectors with the highest median input requirement across output sectors in the Mexican IO table. The second instrument is based on the same restricted set of input sectors, but uses the average plant input requirement coefficient computed from the Colombian plant microdata for 1992 and 1993. Standard errors are clustered at the level of 153 final product groups. ***1%, **5%, and *10% significance levels.

Table 4: Testing Reallocation Effects: Product Exit

Dependent Variable: Product Exit 1994-00	(1) C-Logit	(2) Linear Probability OLS	(3) Linear Probability IV1	(4) Linear Probability IV2	(5) C-Logit	(6) Linear Probability OLS	(7) Linear Probability IV1	(8) Linear Probability IV2
ln(Store Price 1994)	-2.615	-0.313	-0.0392	-0.0656	-5.561***	-0.613***	-0.753***	-0.390
	(1.767)	(0.226)	(0.267)	(0.288)	(1.900)	(0.234)	(0.280)	(0.349)
ln(Store Price 1994)* Change Intermed Imp Tariff 93-00	-0.293*	-0.0362*	-0.00816	-0.0109	-0.553***	-0.0586**	-0.0731**	-0.0354
	(0.171)	(0.0200)	(0.0245)	(0.0282)	(0.191)	(0.0236)	(0.0291)	(0.0358)
ln(Store Price 1994)* Differentiated Prod Dummy					7.864***	0.881**	1.102***	0.627
					(2.244)	(0.353)	(0.399)	(0.436)
ln(Store Price 1994)* Change Intermed Imp Tariff 93-00* Differentiated Prod Dummy					0.669***	0.0683*	0.0910**	0.0421
					(0.223)	(0.0363)	(0.0415)	(0.0449)
City Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
City-By-Product Group Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Obs	15,556	15,556	15,556	15,556	15,556	15,556	15,556	15,556
1st Stage F-Stat			80.89	63.45			45.91	13.45

The dependent variable is a zero/one identifier for whether the product was replaced in the store sample between 1994-2000. All specifications include city-by-product group fixed effects.All specifications include city-by-product group fixed effects.Intermediate tariff changes are weighted averages in percentage points, where weights are input requirement coefficients across four digit sectors of the Mexican IO table. Instrumental variable results are 2nd stage IV estimates after instrumenting for input tariff changes. The first instrument is based on the weighted average tariff changes of the 30% of input sectors with the highest median input requirement across output sectors in the Mexican IO table. The second instrument is based on the same restricted set of input sectors, but uses the average plant input requirement coefficient computed from the Colombian plant microdata for 1992 and 1993. Standard errors are clustered at the level of 153 final product groups. ***1%, **5%, and *10% significance levels.

Table 5: Do the Rich and the Poor Consume Identical Items at Different Prices?

Dependent Variable: ln(Unit Value)	(1)	(2)
2nd Per Capita Household Income Quintile	0.00297	0.00962
	(0.0106)	(0.00873)
3rd Per Capita Household Income Quintile	0.0288**	0.0426***
	(0.0125)	(0.0110)
4th Per Capita Household Income Quintile	0.0454***	0.0573***
	(0.0148)	(0.0122)
5th Per Capita Household Income Quintile	0.0803***	0.0983***
	(0.0197)	(0.0146)
City Fixed Effects	✓	✓
Product Group Fixed Effects	✓	✓
City-Product Group Fixed Effects	✓	✓
Store Type Fixed Effects	✗	✓
City-Store Type Fixed Effects	✗	✓
Product-Store Type Fixed Effects	✗	✓
City-Product-Store Type Fixed Effects	✗	✓
Obs	122,572	122,572
N(Households)	7632	7632
R^2	0.894	0.929

The dependent variable is reported purchase unit values in 118 out of a total of 255 processed tradable product groups in the 1994 household consumption survey. Income quintiles are based on per capita household incomes. Household consumption surveys include the following store types: Markets, street vendors, convenience and specialized stores, and supermarkets and department stores. Standard errors are clustered at the municipality level. ***1%, **5%, and *10% significance levels.

Table 6: Cost of Living Effects across the Income Distribution

	Differences in Tradable Price Index Effect		
	Baseline	Lower Bound	Upper Bound
2nd Income Quintile	-0.00428*	-0.00242	-0.00776*
	(0.00227)	(0.00179)	(0.00405)
3rd Income Quintile	-0.0110***	-0.00699***	-0.0195***
	(0.00269)	(0.00187)	(0.00482)
4th Income Quintile	-0.0147***	-0.00763***	-0.0259***
	(0.00269)	(0.00224)	(0.00479)
5th Income Quintile	-0.0259***	-0.0142***	-0.0440***
	(0.00325)	(0.00255)	(0.00571)
Household Obs	6328	6328	6328

Point estimates are based on nationally representative sample weights. Standard errors are clustered at the municipality level. ***1%, **5%, and *10% significance levels. Price index effects are based on reported household unit purchase values in combination with the estimated relative store price effect of US import tariff cuts, and based on the average NAFTA tariff reduction (12 percentage points). "Baseline" is estimated using the observed average relative price effect of input tariff cuts in Column 5 of Table 1. "Lower Bound" is estimated under the assumption that no relative price effects are present in undifferentiated sectors. "Upper Bound" is estimated under the assumption that the observed relative price effect in differentiated sectors (Column 3 of Table 2) operates in all processed tradable product groups.

9 Online Appendix - Not for Publication

This appendix proceeds in three sections. Appendix 1 presents additional figures and tables referred to in the main text. Appendix 2 presents additional results of the model. Appendix 3 provides further description of the data and processing.

Appendix 1: Additional Figures and Tables

Appendix Figures

Figure A.1: Two Notable Features about Mexican and Developing Country Imports

Figure A.1.1: What Do Developing Countries Import?

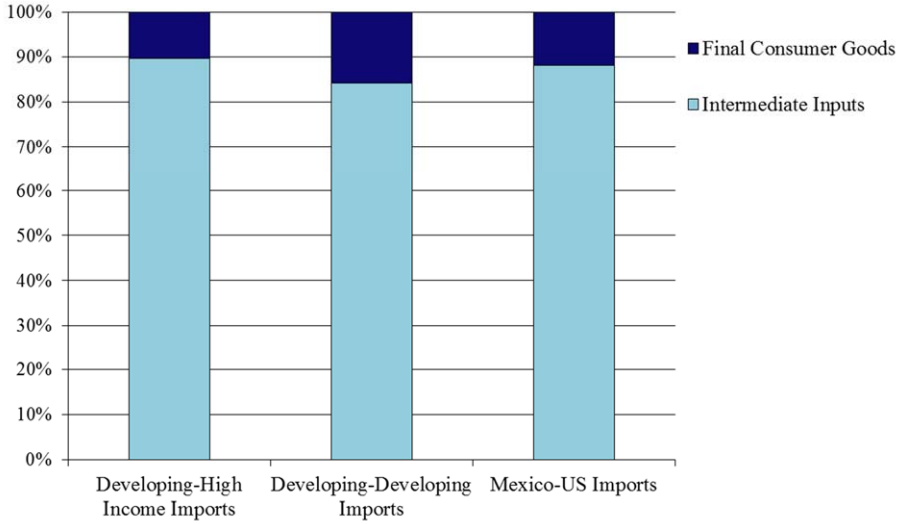


Figure A.1.2: Variation in Use of Imported Inputs

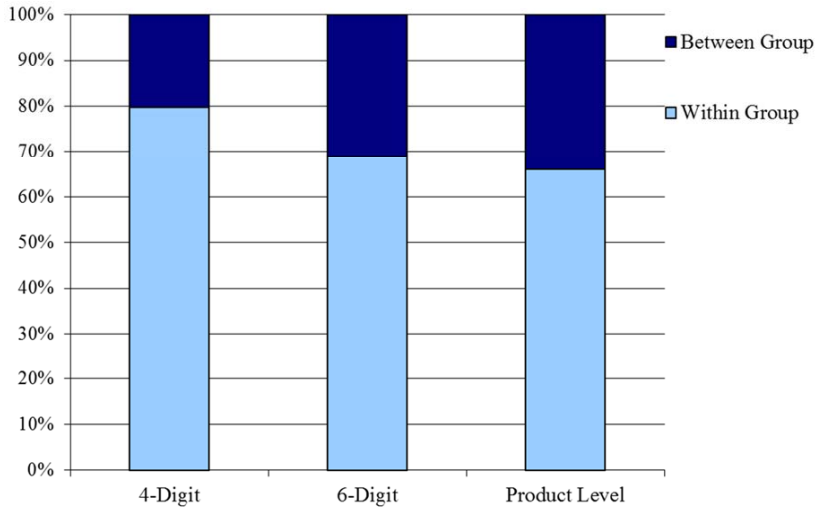


Figure A.1.A depicts end use shares in the sum of imports across different pairs of country groups over the period 1994-2000. From left to right the bars depict developing country imports from high income countries, developing country imports from developing countries, and Mexican imports from the US. "Developing" and "High Income" refer to low-and-middle income and high income countries according to the World Bank's classification in 2010 respectively. Data on import flows are from the World Bank's WITS database. End-use classifications into final consumption and intermediate goods are based on BEC classifications. Intermediates are defined as all imports other than final household consumption goods (BEC 6, 112, 122 and 522). Figure A.1.B depicts the variance decomposition of plant level imported input shares into between and within product group components. The estimates are from Mexican plant data in 1994 and conditional on state fixed effects. The number of plants is 6341. "4-digit", "6-digit", and "Product Level" refer to 80, 203, and 3234 manufacturing product groups respectively. The number of unique product lines (plant-by-product combinations) is 21478.

Figure A.2: Mexican Tariffs on US Imports 1993-2000

Figure A.2.1: Average Applied Tariff Rates

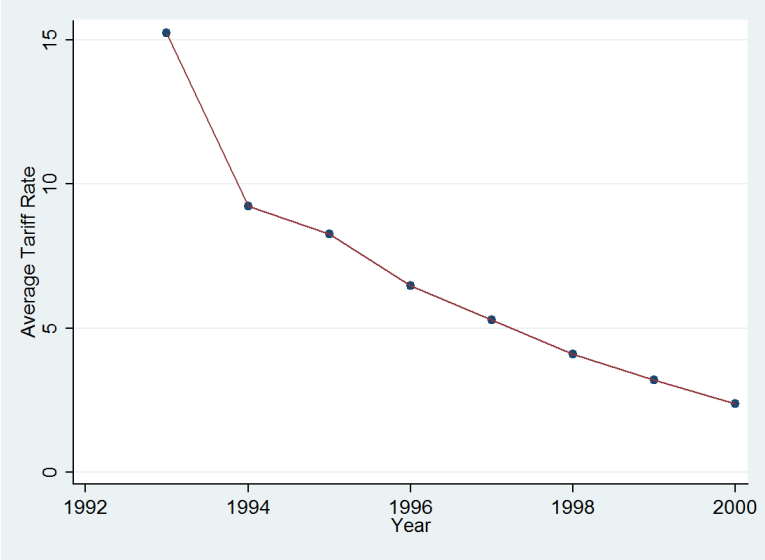


Figure A.2.2: Sectoral Variation

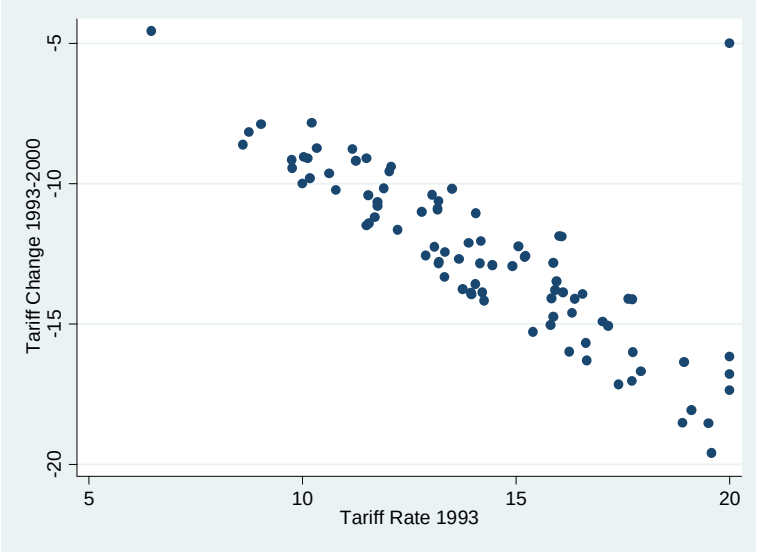
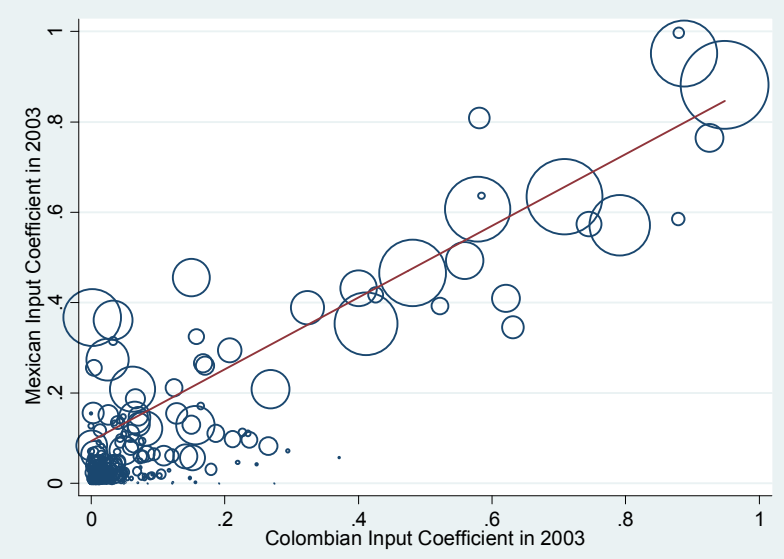


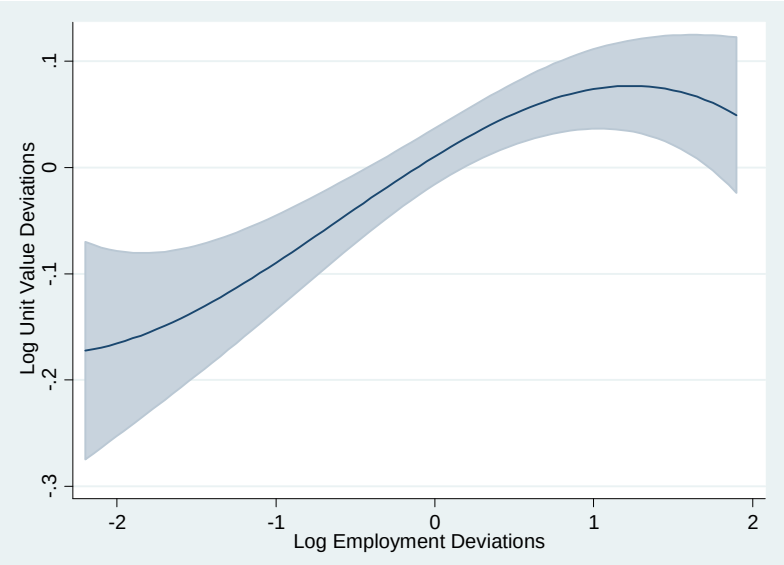
Figure A.2.A depicts average applied tariff rates on US manufacturing imports over the period 1993-2000. Figure A.2.B depicts the relationship between changes and initial levels of average applied tariff rates across four digit US manufacturing sectors between 1993-2000. Source: Secretaria de Economia.

Figure A.3: Comparing Colombian and Mexican IO Coefficients in 2003



The figure plots the input requirement coefficients of the Colombian IO table (x-axis) and the Mexican IO table (y-axis) in the year 2003. Each data point refers to a bilateral input requirement between two three digit industries, and the size of the circle is weighted by input sales reported in the Mexican IO table.

Figure A.4: Plant Product Line Unit Values and Plant Employment in 1994

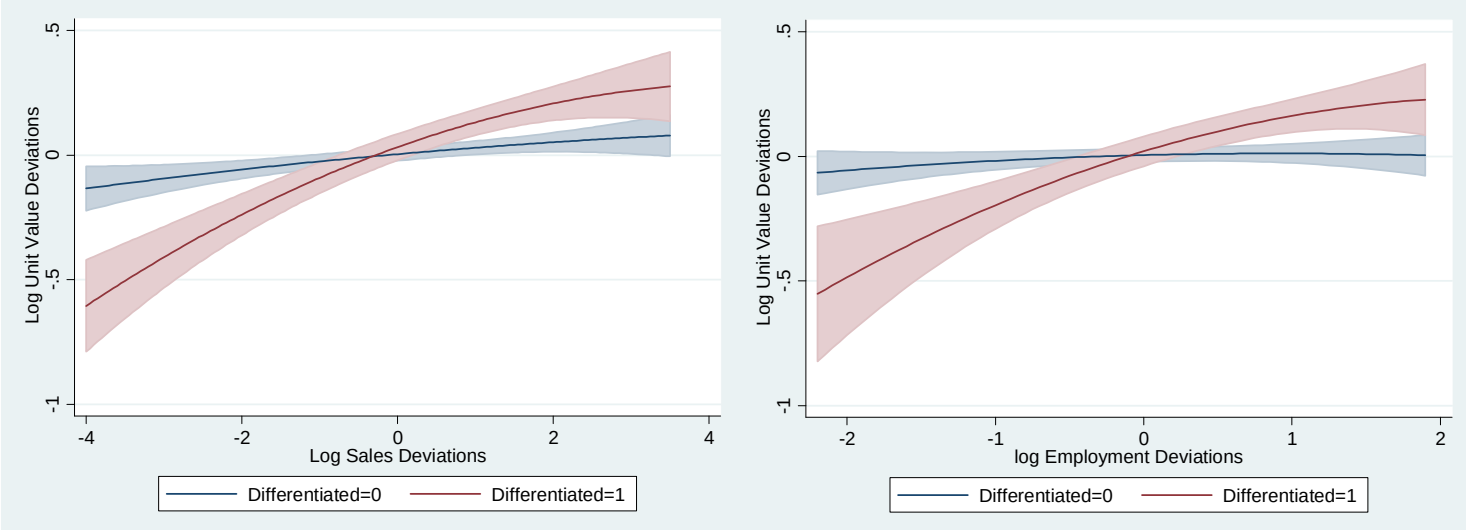


The fitted relationship corresponds to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). Standard errors are clustered at the product level and the shaded area indicates 95% confidence intervals. The y-axis depicts the residuals of a regression of log monthly product line unit values on month-by-product and month-by-state fixed effects. Estimations are based 2615 plants in 78 six digit final good manufacturing sectors and 1000 products over 12 months in 1994. The number of observations in this regression is 92464. The x-axis depicts the residuals of a regression of annual 1994 plant level employment on product and state fixed effects. The number of observations in this regression is equal to the number of unique product lines (8924). The bottom and top 0.5% on the x-axis are excluded from the graph.

Figure A.5: Unit Value Elasticities and Alternative Measures of Vertical Differentiation

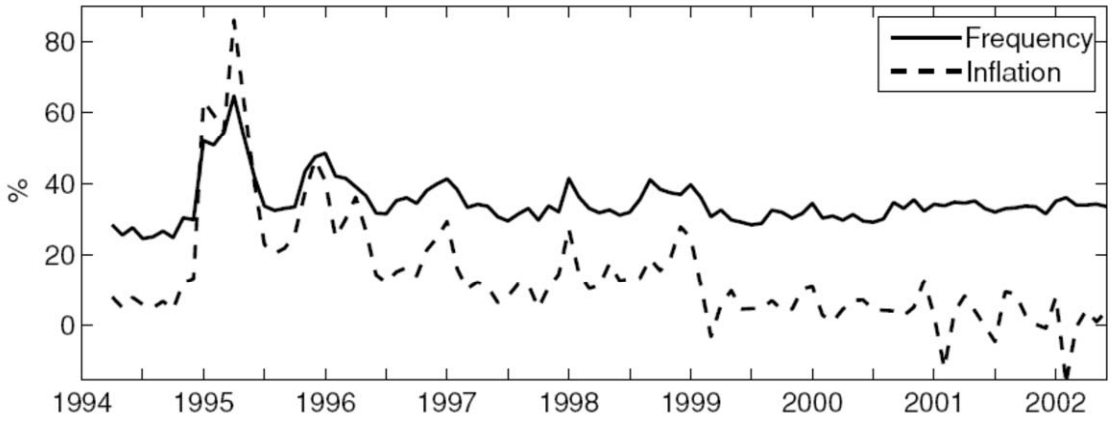
Figure A.5.1: Unit Values and Sales

Figure A.5.2: Unit Values and Employment



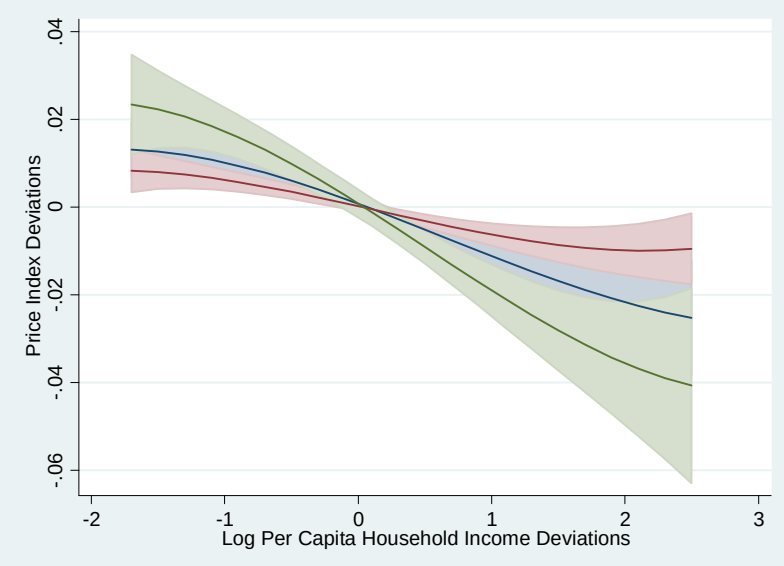
The fitted relationships correspond to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). The y-axis in both graphs depict the residuals of a regression of log product-line unit values on month-by-product and month-by-state fixed effects. The x-axis in A.5.1 depicts residuals of a regression of monthly log product line sales on the same fixed effects. The x-axis in A.5.2 depicts residuals of a regression of annual plant level log employment on state and product fixed effects. The sample is broken down into four-digit sectors with above or below mean shares of R&D and advertisement over sales following Sutton (1998) (Differentiated=1,0 respectively). These measures are reported in Kugler and Verhoogen (2012) and were matched to Mexican final goods manufacturing industries in 1994 at the four digit level. The bottom and top 0.5% are excluded from the graph. Standard errors are clustered at the product level and the shaded area indicates 95% confidence intervals.

Figure A.6: The Peso Crisis and Spike of Price Changes 1994-1995



The figure is taken from Gagnon (2009, pp. 1233). It depicts monthly frequencies of price changes and CPI inflation for non-regulated goods and services.

Figure A.7: Alternative Estimates of NAFTA's Effect on Cost of Living Inflation



The fitted relationship corresponds to the best fitting polynomial functional form according to the Akaike Information Criterion (AIC). Standard errors are clustered at the municipality level and the shaded area indicates 95% confidence intervals. The y-axis depicts mean deviations of estimated household cost of living inflation of tradable consumption due to a 12% tariff cut on US imports. The steepest, middle, and flattest functions are based on "upper bound", "baseline", and "lower bound" estimations respectively. Estimations are based on urban Mexican households in 1994 and subject to nationally representative sample weights. The bottom and top 0.5% on the x-axis are excluded from the graph.

Appendix Tables

Table A.1: Coverage of Store Price Sample in Total Household Consumption

	July, August, September 1994	July, August, September 2000	1994-2000
Number of Monthly Store Price Quotes in 35 Cities	28,515	40,280	
Tradables	24,089	33,699	
Processed Tradeables	16,741	22,139	
Estimation Sample	13,545	13,545	13,545
Product Replacements in Processed Tradables			3499
Basket Net Expansion in Processed Tradables			5398
Tradable Coverage in Total Urban Household Consumption (from ENIGH Consumer Surveys)	0.54	0.50	
Processed Tradables' Coverage in Tradable Consumption	0.70	0.66	
Estimation Sample Coverage in Total Expenditure	0.38	0.33	

Table A.2: Input Sectors with Highest Median Total Requirement Coefficients across Mexican Output Sectors

Rank	4-Digit Input Sector
1	Production of oil and gas
2	Production of basic chemicals
3	Production of products derived from petroleum and coal
4	Production of products made from plastics
5	Production of products made from paper and carton
6	Production of celulosis, paper and carton
7	Production of motor parts
8	Production of rubber, waxes and chemical fibres
9	Printing and related industries
10	Production of paint, lamination and adhesives
11	Production of other chemicals
12	Other industrial production
13	Production of iron and steel
14	Production of wood products
15	Production of clothing
16	Production of products made from iron and steel
17	Production of textiles
18	Production of beveridges
19	Production of non-metal mining products
20	Production of shoes
21	Production of products made from rubber
22	Production of electrical components
23	Production of industrial machinery
24	Production of other wood products
25	Production of non-ferrous metals except aluminium
26	Production of cleaning products and personal care
27	Production of glass and products made from glass
28	Production of metal covers and finishings
29	Production of other textiles except clothing
30	Production of yarn and textile fibres

Table A.3: Technology Parameter Estimates from Plant Microdata

Estimation Samples	Dependent Variable: ln(Unit Value)	(1) OLS	(2) OLS	(3) IV
All 6-Digit Manufacturing Sectors	ln(Sales)	0.0486***		0.0444***
		(0.00594)		(0.0123)
	ln(Employment)		0.0363***	
			(0.0102)	
	Obs	170,240	167,449	167,449
	N(Plants)	5779	5665	5665
	Within-R^2	0.017	0.009	
Final Goods 6-Digit Manufacturing Sectors	ln(Sales)	0.0586***		0.0798***
		(0.00788)		(0.0161)
	ln(Employment)		0.0650***	
			(0.0135)	
	Obs	92,464	90,903	90,903
	N(Plants)	2615	2560	2560
	Within-R^2	0.025	0.014	
Differentiated Final Goods 6-Digit Manufacturing Sectors	ln(Sales)	0.105***		0.239***
		(0.0156)		(0.0309)
	ln(Employment)		0.212***	
			(0.0296)	
	Obs	25,449	25,272	25,272
	N(Plants)	733	728	728
	Within-R^2	0.062	0.063	

All regressions include state-by-month and month-by-product fixed effects. Product group refer to several thousand disaggregated product descriptions within 203 6-digit manufacturing sectors. Unit values and sales vary across plants, product lines within plants, and months. Annual employment varies across plants. The first stage regressions of ln(Sales) on ln(Employment) not reported here are highly statistically significant. Standard errors are clustered at the product level. ***1%, **5%, and *10% significance levels.

Table A.4: Unit Value-Sales Elasticities and Alternative Measures of Vertical Differentiation

Dependent Variable: ln(Unit Value)	(1)	(2)	(3)	(4)	(5)	(6)
ln(Sales)	0.0563***	-0.00494				
	(0.00772)	(0.00831)				
ln(Sales) *						
R&D/Advert Intensity		1.056***				
		(0.128)				
ln(Employment)			0.0650***	-0.0320**		
			(0.0135)	(0.0152)		
ln(Employment) *						
R&D/Advert Intensity				1.802***		
				(0.283)		
Import Share					0.538***	-0.0547
					(0.103)	(0.105)
Import Share *						
R&D/Advert Intensity						10.63***
						(1.697)
State Fixed Effects	✓	✓	✓	✓	✓	✓
State*Month Fixed Effects	✓	✓	✓	✓	✓	✓
Product*Month Fixed Effects	✓	✓	✓	✓	✓	✓
Obs	92,464	92,464	90,903	90,903	91,769	91,769
N(Plants)	2615	2615	2560	2560	2584	2584
Within-R^2	0.025	0.041	0.014	0.026	0.016	0.026

All regressions include state-by-month and month-by-product fixed effects. "R&D/Advert Intensity" is based on Sutton (1998) and refers to US shares of R&D and advertising expenditures in firm sales, averaged to the four digit SITC industry sectors. These measures are reported in Kugler and Verhoogen (2012) and were matched to Mexican final goods manufacturing industries in 1994 at the four digit level. Standard errors are clustered at the product level. ***1%, **5%, and *10% significance levels.

Table A.5: Rich-Poor Price Gaps and Product Group Differentiation

Dependent Variable: ln(Unit Value)	(1)	(2)
ln(Income per Capita)	0.0295***	0.0343***
	(0.00486)	(0.00541)
ln(Income per Capita)*	0.0223**	
Differentiated Prod Dummy	(0.00939)	
ln(Income per Capita)*Scope		0.0420*
		(0.0233)
City Fixed Effects	✓	✓
Product Group Fixed Effects	✓	✓
City-Product Group Fixed Effects	✓	✓
Store Type Fixed Effects	✓	✓
City-Store Type Fixed Effects	✓	✓
Product-Store Type Fixed Effects	✓	✓
City-Product-Store Type Fixed Effects	✓	✓
Obs	122,572	122,572
N(Households)	7632	7632
R^2	0.892	0.892

The dependent variable is reported purchase unit values in 118 out of a total of 255 processed tradable product groups in the 1994 household consumption survey. Income quintiles are based on per capita household incomes. Household consumption surveys include the following store types: Markets, street vendors, convenience and specialized stores, and supermarkets and department stores. Standard errors are clustered at the municipality level. ***1%, **5%, and *10% significance levels.

Table A.6: Plant Data Descriptive Statistics

	Full Sample	Final Good Sectors Only
Number of 6-Digit Sectors	203	78
Number of Establishments	6341	2736
Number of Products Reported Over 12 Months	3234	1315
Number of Month * Establishment * Product Observations	257,736	134,112
Average Number of Products Per Establishment	3.4	4.1
Median Employment Size	105	218

Table A.7: Household Consumption Survey Descriptive Statistics

	Urban Household Sample
Number of Households	7764
Number Of Municipalities	236
Total Number of Reported Transactions Across all Expenditure Categories	524,782
Number of Reported Transactions In Processed Tradables Sample (255 Product Groups)	279,584
Number of Transactions In Processed Tradables Sample With Unit Values	122,572
Share of Processed Tradables Transactions at Markets	0.081
Share of Processed Tradables Transactions at Street Vendors	0.112
Share of Processed Tradables Transactions at Convenience and Specialized Stores	0.485
Share of Processed Tradables Transactions at Supermarkets and Department Stores	0.264

Table A.8: Re-Estimating the Average Effect of Tariff Cuts after Instrumenting for Initial Prices in Q3 1994 with Lagged Initial Prices in Q1 1994

Dependent Variable: Change ln(Store Price) 1994-00	(1) Baseline	(2) Controls	(3) IV1 (Most used inputs)	(4) IV2 (Most used inputs & Colombian IO data)
ln(Store Price 1994)	0.238	0.229	0.276	0.243
	(0.235)	(0.230)	(0.241)	(0.282)
ln(Store Price 1994)*				
Change Intermed Imp Tariff 93-00	0.0424*	0.0483**	0.0463*	0.0429
	(0.0239)	(0.0233)	(0.0248)	(0.0281)
ln(Store Price 1994)*				
Change Export Tariff 93-00		-0.0105		
		(0.00777)		
ln(Store Price 1994)*				
Change Final Imp Tariff 93-00		-0.00215		
		(0.00197)		
City Fixed Effects	✓	✓	✓	✓
Product Group Fixed Effects	✓	✓	✓	✓
City-By-Product Group FX	✓	✓	✓	✓
Obs	13,491	13,491	13,491	13,491
1st Stage F-Stat	56858.10	21419.50	36.45	27.08
N(Product Groups)	153	153	153	153

All columns present second stage IV estimates after instrumenting for initial prices in the third quarter of 1994 with lagged initial prices in the first quarter of 1994. Intermediate tariff changes are weighted averages in percentage points, where weights are input requirement coefficients across four digit sectors of the Mexican IO table. Columns 3 and 4 present IV estimates after also instrumenting for input tariff changes in addition to initial prices. The first instrument is based on the weighted average tariff changes of the 30% of input sectors with the highest median input requirement across output sectors in the Mexican IO table. The second instrument is based on the same restricted set of input sectors, but uses the average plant input requirement coefficient computed from the Colombian plant microdata for 1992 and 1993. Standard errors are clustered at the level of 153 final product groups. ***1%, **5%, and *10% significance levels.

Table A.9: Unit Value-Plant Size Elasticities across Sectors

Mexican Plant Data Sector (6-Digit)	Scope	Standard Error	Obs	Differentiated Prod Dummy
ELABORACION DE BEBIDAS DESTILADAS DE AGAVES	0.725	(0.351)	188	1
ELABORACION DE BEBIDAS DESTILADAS DE CAÑA	0.569	(0.112)	289	1
ELABORACION DE BEBIDAS DESTILADAS DE UVA	0.419	(0.105)	145	1
ELABORACION DE BOTANAS Y PRODUCTOS DE MAIZ NO MENCIONADOS ANTERIORMENTE	0.266	(0.0501)	1039	1
ELABORACION DE CREMA, MANTEQUILLA Y QUESO	0.0977	(0.0355)	2786	1
ELABORACION DE GELATINAS, FLANES Y POSTRES EN POLVO PARA PREPARAR EN EL HOGAR	0.132	(0.0236)	108	1
ELABORACION DE SOPAS Y GUISOS PREPARADOS	0.766	(0.146)	375	1
FABRICACION DE ACEITES Y GRASAS VEGETALES COMESTIBLES	0.0419	(0.0203)	1889	1
FABRICACION DE ALGODON ABSORBENTE, VENDAS Y SIMILARES	0.682	(0.285)	264	1
FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR	0.189	(0.101)	1327	1
FABRICACION DE CALZADO PRINCIPALMENTE DE CUERO	0.0705	(0.0403)	1746	1
FABRICACION DE CHICLES Y DULCES	0.502	(0.132)	227	1
FABRICACION DE DISCOS Y CINTAS MAGNETOFONICAS	0.355	(0.188)	356	1
FABRICACION DE EQUIPOS Y APARATOS DE AIRE ACONDICIONADO, REFRIGERACION Y CALEFACCION	0.365	(0.184)	889	1
FABRICACION DE JUGUETES DE PLASTICO	0.242	(0.144)	427	1
FABRICACION DE PELICULAS, PLACAS Y PAPEL SENSIBLE PARA FOTOGRAFIA	4.017	(-9.69e-12)	155	1
FABRICACION DE PIEZAS Y ARTICULOS DE HULE NATURAL O SINTETICO	0.308	(0.185)	1251	1
FABRICACION DE PRODUCTOS FARMACEUTICOS	0.404	(0.0676)	8019	1
FABRICACION DE ROPA INTERIOR DE PUNTO	0.0751	(0.0340)	913	1
FABRICACION DE SUETERES	0.183	(0.0979)	696	1
FABRICACION Y ENSAMBLE DE ESTUFAS Y HORNOS DE USO DOMESTICO	0.581	(0.268)	360	1
FABRICACION Y ENSAMBLE DE LAVADORAS Y SECADORAS DE USO DOMESTICO	1.548	(1.00e-08)	120	1
FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO	11.03	(7.42e-07)	169	1
HILADO Y TEJIDO DE HENEQUEN	0.0307	(0.0181)	269	1
TRATAMIENTO Y ENVASADO DE LECHE	0.100	(0.0502)	1109	1
VINIFICACION (ELABORACION DE BEBIDAS FERMENTADAS DE UVA)	1.042	(0.345)	156	1
BENEFICIO DE ARROZ	0.0492	(0.170)	618	0
BENEFICIO DE CAFE	0.0332	(0.0486)	563	0
BENEFICIO DE TABACO	0.0144	.	8	0
CERVEZA	-0.0876	(0.0293)	530	0
CONFECCION DE CAMISAS	0.101	(0.106)	1035	0
CONFECCION DE ROPA EXTERIOR PARA CABALLERO HECHA EN SERIE	-0.0166	(0.0591)	1258	0
CONFECCION DE ROPA EXTERIOR PARA DAMA HECHA EN SERIE	-0.00858	(0.0951)	4344	0
CONFECCION DE ROPA EXTERIOR PARA NIÑOS Y NIÑAS	-0.0845	(0.103)	2149	0
CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES	-0.00812	(0.0881)	872	0
CONGELACION Y EMPACADO DE CARNE FRESCA	0.00990	(0.117)	662	0
CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS	0.119	(0.0751)	348	0
EDICION DE LIBROS Y SIMILARES	-0.0975	(0.0491)	1693	0
EDICION DE PERIODICOS Y REVISTAS	0.0361	(0.0692)	1384	0
ELABORACION DE ALMIDONES, FECULAS Y LEVADURAS	-0.171	(0.0719)	607	0
ELABORACION DE AZUCAR Y PRODUCTOS RESIDUALES DE LA CAÑA	-0.181	(0.0722)	1358	0
ELABORACION DE CAFE SOLUBLE	0.606	(0.504)	148	0
ELABORACION DE COCOA Y CHOCOLATE DE MESA	0.0470	(0.0685)	894	0
ELABORACION DE CONCENTRADOS, JARABES Y COLORANTES NATURALES PARA ALIMENTOS	0.0341	(0.152)	1066	0
ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS	0.0498	(0.115)	836	0
ELABORACION DE HARINA DE MAIZ	0.357	(0.271)	229	0
ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO	0.163	(0.104)	288	0
ELABORACION DE OTROS PRODUCTOS ALIMENTICIOS PARA CONSUMO HUMANO	-0.748	(0.181)	211	0
ELABORACION DE REFRESCOS Y OTRAS BEBIDAS NO ALCOHOLICAS	-0.0197	(0.0307)	3109	0
FABRICACION DE ACUMULADORES Y PILAS ELECTRICAS	0.0661	(0.0453)	286	0
FABRICACION DE ARTICULOS Y UTILES PARA OFICINA, DIBUJO Y PINTURA ARTISTICA	0.0127	(0.245)	910	0
FABRICACION DE CERILLOS	-0.0185	(0.0784)	173	0
FABRICACION DE COLCHONES	0.0738	(0.0858)	2536	0
FABRICACION DE FOCOS, TUBOS Y BOMBILLAS PARA ILUMINACION	-1.821	(0.714)	535	0
FABRICACION DE HILO PARA COSER, BORDAR Y TEJER	0.147	(0.177)	389	0
FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS	-0.0342	(0.102)	793	0
FABRICACION DE MEDIAS Y CALCETINES	0.0255	(0.136)	1283	0
FABRICACION DE OTRAS PARTES Y ACCESORIOS PARA AUTOMOVILES Y CAMIONES	0.156	(0.368)	675	0
FABRICACION DE PAPEL	0.0309	(0.0720)	1333	0
FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES	0.0912	(0.0897)	3438	0
FABRICACION DE PINTURAS, BARNICES, LACAS Y SIMILARES	0.0623	(0.0735)	4547	0
FABRICACION DE PRODUCTOS DE CUERO, PIEL Y MATERIALES SUCEDANEOS	0.161	(0.135)	885	0
FABRICACION DE ROPA EXTERIOR DE PUNTO Y OTROS ARTICULOS	0.0897	(0.238)	611	0
FABRICACION DE TELAS NO TEJIDAS	0.00760	(0.0706)	216	0
FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES	-0.727	(0.213)	353	0
FABRICACION Y ENSAMBLE DE MOTOCICLETAS, BICICLETAS Y SIMILARES	-0.410	(0.518)	275	0
FABRICACION Y ENSAMBLE DE REFRIGERADORES DE USO DOMESTICO	0.107	(0.0860)	72	0
FABRICACION Y ENSAMBLE DE AUTOMOVILES Y CAMIONES	-0.122	(0.170)	405	0
FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA	-0.0276	(0.0746)	4050	0
FABRICACION Y REPARACION DE QUEMADORES Y CALENTADORES	-0.0262	(0.0802)	212	0
IMPRESION Y ENCUADERNACION	-0.150	(0.117)	3633	0
INDUSTRIA ARTESANAL DE ARTICULOS DE VIDRIO	-0.519	(0.204)	509	0
MATANZA DE GANADO Y AVES	-0.0527	(0.0866)	653	0
MOLIENDA DE TRIGO	0.0223	(0.0269)	3824	0
PANADERIA Y PASTELERIA INDUSTRIAL	-0.134	(0.0399)	2089	0
PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE	0.0432	(0.0439)	3862	0
PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS	-0.475	(0.269)	460	0
PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES	0.0521	(0.0451)	2422	0

Each point estimate corresponds to a separate regression of unit values on plant employment, region-by-month fixed effects and product fixed effects within each processed tradable six digit manufacturing sector. Standard errors are clustered at the plant level.

Appendix 2: Additional Results of the Model

For ease of exposition product group subscripts k are suppressed unless indicated otherwise.

Preferences

From preferences in expression (1) of the paper, consumer optimization yields the following expression for household expenditure:

$$p_i x_{hi}=y_{hi}=\frac{p_i^{1-\sigma}\left(q_i^{\varphi_h}\right)^{\sigma\text{-}1}}{\int_{j=0}^{N} p_j^{1-\sigma}\left(q_j^{\varphi_h}\right)^{\sigma\text{-}1}dj}y_h=s_{hi}y_h$$

s_{hi} is the household's expenditure share on variety i and y_h is its total expenditure on product group k. Within product group expenditure shares increase in quality valuation for products with above average quality, and decrease in quality valuation for below average quality products:

$$\frac{\partial s_{hi}}{\partial \varphi_h}=(\sigma\text{-}1)s_{hi}\left(\ln q_i\text{-}\sum\nolimits_I s_{hi} ln q_i\right)$$

Weighted average quality of the household's consumption basket increases in quality valuation:

$$\frac{\partial\left(\sum_I s_{hi}(ln q_i-\left(\frac{1}{I}\sum_I ln q_i\right)\right)}{\partial\varphi_h}=\text{I*Cov}\left(\left(\frac{\partial s_{hi}}{\partial\varphi_h}\right),\left(ln q_i-\overline{ln q_i}\right)\right)>0$$

Finally, I solve for the elasticity of market sales with respect to product quality to get:

$$\frac{d\left(\sum_H s_{hi}y_h\right)}{\left(\sum_H s_{hi}y_h\right)}/\frac{dq_i}{q_i}=(\sigma-1)\left(\sum\nolimits_H \frac{y_{hi}}{y_i}\varphi_h\right)=(\sigma-1)\,\varphi_i^*$$

which is equation (2) in the paper. Following the discussion in the text, I define: $q_i^*=q_i{}^{\varphi_i^*}$.

Notice that the result in expression (2) of the paper can in principle greatly complicate the modeling of quality choice on the producer side in the Kugler and Verhoogen (2012) model. In particular, while the finding that market shares reflect expenditure weighted household evaluations of product quality is intuitive and not specific to preferences in expression (1) of the paper, the CES structure does impose the convenient assumption that rich and poor households respond to price changes in the same way. If this were not the case, then expenditure shares $\left(\frac{y_{hi}}{y_i}\right)$, and thus the market evaluation of a given quality characteristic, would vary across a firm's pricing decisions. In other words, the CES structure assures that the change in sales due to a change in product quality is independent on a firm's pricing decision.

Technology

The simplest possible way to introduce foreign inputs into the setting of Kugler and Verhoogen (2012) is by letting input quality be increasing in shares of imported inputs. Expression (5) of the paper captures this assumption in a simple reduced form approach by letting the elasticity of unit input costs with respect to input quality (δ) be an increasing function of imported input costs (τ). Since I deliberately abstract from relative factor income effects of import access, this is convenient but without loss of generality. To see this, consider a unit input cost function c=c$(w,\tilde{w})$ of any linearly homogeneous input production function where w and $\widetilde{w}$ are prices of a domestic and a foreign factor of production. Using Shephard's lemma, we get the unit factor requirements: a=$\frac{\partial c}{\partial w}$ and b=$\frac{\partial c}{\partial \tilde{w}}$. Differentiating c=c$(w,\tilde{w})$, we get: dc=a dw+b d$\tilde{w}$. Rearranging, we get: $\frac{dc}{c}=\frac{aw}{c}\frac{dw}{w}+\frac{b\tilde{w}}{c}\frac{d\tilde{w}}{\tilde{w}}$ (e.g. Bhagwati *et al.*, 2009, pp. 143-144). The elasticity of input unit costs with respect to input quality can then be written

as: $\left(\frac{dc}{c}/\frac{dz_j}{z_j}\right)=\frac{d\left(\frac{aw}{c}\right)}{dz_j/z_j}\frac{dw}{w}+\frac{d\left(\frac{b\tilde{w}}{c}\right)}{dz_j/z_j}\frac{d\tilde{w}}{\tilde{w}}$, which is increasing in foreign factor costs $\tilde{w}$ as long as the foreign input cost share $\left(\frac{b\tilde{w}}{c}\right)$ is increasing in input quality z_j.

The unit cost functions for production technologies in expression (3) and (5) of the paper are c_i=$\lambda_i^{-1}p_{im}$ and c_j=wz_j^{δ} respectively. Substituting intermediate unit costs into final product unit costs, we get: c_i=λ_i^{-1}wz_i^{δ}. Plant profits are given by:

$$\pi_i=(p_i\text{-}c_i)x_i\text{-f}=(p_i\text{-}\lambda_i^{-1}\text{w}z_i^{\delta})x_i\text{-f}$$

In quality adjusted terms, profits can be written as:

$$\pi_i=\left(\frac{p_i}{q_i^*}-\frac{c_i}{q_i^*}\right)q_i^*x_i\text{-f}=\left(\frac{p_i}{q_i^*}-\lambda_i^{-1}wz_i^{\delta}q_i^{*\text{-}1}\right)q_i^*x_i\text{-f}$$

Equilibrium

Firms simultaneously choose product quality and quality adjusted prices to maximize profits. From the profit equations it is clear that maximizing profits with respect to product quality, implies minimizing $\frac{c_i}{q_i^*}$ with respect to q_i^*, that is minimizing the average variable cost per unit of product quality.[52] The additional parameter restriction $\gamma>\delta$ assures a well behaved optimum. This provides an expression for equilibrium product quality as a function of technical efficiency:

$$q_i^*=\left(\frac{\alpha\gamma}{\gamma-\delta}\right)^{1/\theta}\lambda_i^{\psi}$$

We next solve for intermediate input quality as a function of plant efficiency:

$$z_i=\left(\frac{1}{1-\alpha}\left(\frac{\alpha\gamma}{\gamma-\delta}\right)^{\psi/\vartheta}-\frac{\alpha}{1-\alpha}\right)^{1/\vartheta\gamma}\lambda_i^{\psi/\gamma}$$

Equilibrium intermediate input quality is thus increasing in plant efficiency. Alternatively, we can solve for λ_i as a function of product quality and substitute back into the unit cost function to derive the equilibrium relationship between final product quality and unit costs:

$$c_i=\text{w}\left(\frac{1}{\alpha}-\frac{\delta}{\alpha\gamma}\right)^{-1/\vartheta\psi}\left(\frac{1}{1-\alpha}\frac{\delta}{\gamma}\right)^{\delta/\vartheta\gamma}q_i^{*\eta}$$

η=$\frac{\delta}{\gamma}$-$\frac{1}{\psi}$ is the elasticity of unit costs with respect to final product quality. The equilibrium relationship between product quality and the inverse of quality adjusted marginal costs becomes:

$$\frac{\partial ln q_i^*}{\partial ln\left(q_i^*/c_i\right)}=\frac{1}{1-\eta}$$

Given CES preferences, the equilibrium relationship between observed unit values and product quality can then be expressed as:

$$p_i=\frac{\sigma}{\sigma-1}c_i=\frac{\sigma}{\sigma-1}\text{w}\left(\frac{1}{\alpha}-\frac{\delta}{\alpha\gamma}\right)^{-1/\vartheta\psi}\left(\frac{1}{1-\alpha}\frac{\delta}{\gamma}\right)^{\delta/\vartheta\gamma}q_i^{*\eta}$$

[52]The same condition is present in Johnson (2012), and Feenstra and Romalis (2013). The latter paper attributes this finding to Rodriguez (1979).

Finally, the equilibrium relationship between unit values and quality adjusted productivity becomes:

$$\frac{\partial lnp_i}{\partial ln\left(q_i^*/c_i\right)}=\text{-}1+\frac{\partial lnq_i^*}{\partial ln\left(q_i^*/c_i\right)}=\frac{\eta}{1-\eta}$$

Starting from an initial equilibrium outcome of input quality and output quality choices across plants, the observed final product unit value elasticity with respect to product quality is as derived in the above: $\frac{\partial lnp_i}{\partial lnq_i^*}=\frac{\partial lnc_i}{\partial lnq_i^*}=\eta=\frac{\delta}{\gamma}\text{-}\frac{1}{\psi}$. Import access then lowers the relative cost of inputs with higher foreign value shares which is captured by a change in δ. Denote import tariffs by τ_k, then the cross-derivative expression of interest becomes:

$$\frac{\partial^2 lnp_i}{\partial lnq_i^*\partial\tau}=\frac{\partial^2 lnc_i}{\partial lnq_i^*\partial\tau}=\frac{1}{\gamma}\frac{\partial\delta}{\partial\tau}>0$$

The general equilibrium solution of the model closely follows Melitz (2003). To assure finite means in efficiency draws and final product plant revenues, the shape parameter of the pareto distribution needs to have a lower bound at $\xi>\max(\psi(\sigma-1)(1-\eta),1)$. The cut-off values are determined by two conditions.

First, profits of the marginal plant must be zero: $\pi\left(\lambda^{\text{cutoff}}\right)=\frac{r^{\text{cutoff}}(\lambda)}{\sigma}\text{-f}=0$. Second, free entry implies that ex ante expected profits are zero:

$(1\text{-G}(\lambda^{\text{cutoff}}))\sum_{t=0}^{\infty}(1\text{-}\chi)^t\left(\frac{E(r^{\text{cutoff}}(\lambda))}{\sigma}-f\right)\text{-}f_e=0$. Using these two conditions, and that $\frac{r^{cutoff}(\lambda)}{r^{\text{cutoff}}\left(\lambda^{cutoff}\right)}=\left(\frac{\lambda}{\lambda^{cutoff}}\right)^{\psi(\sigma-1)(1-\eta)}$, we get: $\text{E}\left(r^{\text{cutoff}}(\lambda)\right)=\frac{\xi}{\xi-\psi(\sigma-1)(1-\eta)}\sigma\text{f}$. It follows that:

$$\lambda^{\text{cutoff}}=\lambda_m\left(\frac{f}{f_e\chi}\left(\frac{\xi}{\xi-\psi(\sigma-1)(1-\eta)}-1\right)\right)^{1/\xi}$$

Finally, the free entry condition in combination with the condition that in steady state the mass of new entrants is equal to the mass of exiting firms $M_e(1\text{-G}(\lambda^{\text{cutoff}}))=\chi\text{M}$, and labor market clearing $\left(L=MEr^{\text{cutoff}}(\lambda)-\Delta+M_ef_e\right)$, where L is labor supply and Δ is the difference between final sector revenues and profits, pin down the mass of final good producers in steady state:

$$\text{M}=\frac{L(\xi-\psi(\sigma-1)(1-\eta))}{\xi\sigma f}$$

Cost of Living Implications

Based on the work of Sato (1976) and Vartia (1976), the ideal price index for a homothetic CES utility function is:

$$\left(\frac{e\left(u^*,p^{t1}\right)}{e\left(u^*,p^{t0}\right)}\right)_h=\prod_I\left(\frac{p_{ki}^{t1}}{p_{ki}^{t0}}\right)^{\omega_{hki}}\text{, where }\omega_{hki}=\frac{s_{hki}^{t1}-s_{hki}^{t0}}{ln\left(s_{hki}^{t1}-s_{hki}^{t0}\right)}/\left(\sum_I\frac{s_{hki}^{t1}-s_{hki}^{t0}}{ln\left(s_{hki}^{t1}-s_{hki}^{t0}\right)}\right)$$

I is the number of all varieties pooled across all product groups k in the economy. Household cost of living inflation is a weighted geometric mean of price changes where the weights are ideal log changes of household budget shares. In the following, I will refer to two representative consumers that can be thought of as a poor and a rich household denoted by subscripts P and R. Taking log differences in household cost of living inflation between a poor and a rich household, we get:

$$\ln\left(\frac{e\left(u^{*},p^{t1}\right)}{e\left(u^{*},p^{t0}\right)}\right)_{P}\text{-}\ln\left(\frac{e\left(u^{*},p^{t1}\right)}{e\left(u^{*},p^{t0}\right)}\right)_{R}=\sum\nolimits_{I}\left(s_{kiP}^{t0}-s_{kiR}^{t0}\right)\ln\left(\frac{p_{ki}^{t1}}{p_{ki}^{t0}}\right)$$

which is expression (10) in the paper. In the presence of non-homotheticity in expression (1) in the paper, the Sato-Vartia ideal price index, in principle, does not hold because income changes affect expenditure shares so that the ideal weights (ω_{hki}) cease to hold (e.g. Diewert, 1979). Within the structure of the model, however, (10) represents the difference in the exact ideal price index between two agents due to a *ceteris paribus* change in the relative price of quality. The two underlying assumptions are that i) CES preferences in (1) hold so that elasticities of substitution are the same across households, and ii) we abstract from general equilibrium consequences of import access on relative incomes. If either of these assumptions is violated in reality, then (10) remains an approximation of the true difference in cost of living to the first order, because as in a Laspeyres price index its weights are based on differences in initial expenditure weights.

Appendix 3: Data and Processing

Mexican Store Price Microdata

The definition of product groups used in the paper follows the finest level of product group aggregation reported in the Mexican store price microdata. In total, there are 284 consumer product groups in the central bank store price surveys that are covered consistently over the period 1994 and 2000. These product groups cover all types of household consumption including housing, services, restaurants, transportation, etc. Out of the 284 product groups, the estimation sample of the paper includes 153 product groups that are processed tradables (i.e. they are covered in the manufacturing plant data) and report price information for individual barcode level products. As shown in Table 3.1, this estimation sample results from 192 processed tradable product groups in the store price surveys, of which 153 report monthly price information at the individual barcode item level (rather than store sample average prices). In turn, Table 3.2 provides the product concordance used in the paper between the consumer product groups of the central bank store price surveys, the Mexican IO table sectors, the Colombian IO table sectors, and the Mexican plant microdata sectors.

Colombian Plant Microdata

For the construction of the second instrument in the paper, the Colombian statistical institute DANE agreed to provide the mean of the input share for each 8-digit input sector across all plants within 8-digit output sectors.[53] Table 3.2 provides the product group descriptions and concordances. See also Kugler and Verhoogen (2009; 2012) for a detailed discussion of the Colombian manufacturing plant microdata.

Household Consumption Surveys

Table 3.3 provides product descriptions of the 255 processed tradable product groups contained in the 1994 household expenditure survey (ENIGH), as well as the concordance between these product groups and the sectors of the Mexican plant microdata. The latter concordance is used in the final part of the paper to obtain upper and lower bound estimates of the cost of living effects (which requires assigning consumer product groups to scopes for quality differentiation estimated from the plant data in 1994).

[53] Due to confidentiality concerns, only output sectors with more than 3 plants were included in these data. For this reason, I also obtained the mean input coefficients across plants within a 5-digit output sector which is the next available well defined level of Colombian sectoral aggregation. In cases where a store price product group was not available at the 8-digit level in the Colombian IO data, I match the product group to the corresponding 5-digit output product sector.

Table A.10: Store Price Product Groups

Store Price Product Group	Estimation Sample	Services or Unprocessed Product Groups	Not Barcode Equivalent Price Information
ABRIGOS	×	×	✓
ACEITE VEGETAL	✓	×	×
ACEITES LUBRICANTES	×	✓	✓
ACUMULADORES	✓	×	×
AGUACATE	×	✓	✓
AJO	×	✓	✓
ANALGÉSICOS	✓	×	×
ANÁLISIS	×	✓	✓
ANTECOMEDORES	✓	×	×
ANTIBIÓTICOS	✓	×	×
ANTICONCEPTIVOS Y HORMONALES	✓	×	×
ANTIGRIPALES	✓	×	×
ARROZ	✓	×	×
ARTÍCULOS DE MAQUILLAJE	✓	×	×
ARTÍCULOS DEPORTIVOS	✓	×	×
ATÚN EN LATA	✓	×	×
AUTOBÚS FORÁNEO	×	✓	✓
AUTOBÚS URBANO	×	✓	✓
AUTOMÓVILES	×	✓	✓
AZÚCAR	✓	×	×
BARBACOA O BIRRIA	×	✓	✓
BATERÍAS DE COCINA	×	×	✓
BICICLETAS	✓	×	×
BISTEC DE RES	✓	×	×
BLANQUEADORES Y LIMPIADORES	✓	×	×
BLUSA PARA NIÑO	×	×	✓
BLUSAS PARA MUJER	×	×	✓
BOLSAS, MALETAS Y CINTURONES	×	×	✓
BRANDY	✓	×	×
CAFÉ SOLUBLE	✓	×	×
CAFÉ TOSTADO	✓	×	×
CAFETERÍAS	×	✓	✓
CAJETAS	✓	×	×
CALABACITA	×	✓	✓
CALCETINES	×	×	✓
CALENTADORES PARA AGUA	✓	×	×
CALZONCILLOS	×	×	✓
CAMARÓN	✓	×	×
CAMISAS	×	×	✓
CAMISETA PARA BEBÉ	×	×	✓
CAMISETAS	×	×	✓
CANTINAS	×	✓	✓
CARNE MOLIDA DE RES	✓	×	×
CARNES AHUMADAS O ENCHILADAS	✓	×	×
CARNES SECAS	✓	×	×
CARNITAS	×	✓	✓
CARRERA CORTA E IDIOMAS	×	✓	✓
CEBOLLA	×	✓	✓
CENTRO NOCTURNO	×	✓	✓
CEREALES EN HOJUELA	✓	×	×
CERILLOS	✓	×	×
CERVEZA	✓	×	×
CHAMARRAS	×	×	✓
CHAYOTE	×	✓	✓
CHÍCHARO	×	✓	✓
CHILE POBLANO	×	✓	✓
CHILE SECO	×	✓	✓
CHILE SERRANO	×	✓	✓
CHILES PROCESADOS	✓	×	×
CHOCOLATE EN POLVO	✓	×	×
CHOCOLATE EN TABLETA	✓	×	×
CHORIZO	✓	×	×
CHULETA	✓	×	×
CIGARRILLOS	✓	×	×
CINE	×	✓	✓

Table A.10: Store Price Product Groups - continued

Store Price Product Group	Estimation Sample	Services or Unprocessed Product Groups	Not Barcode Equivalent Price Information
CLUB DEPORTIVO	×	✓	✓
COBIJAS	✓	×	×
COL	×	✓	✓
COLCHAS	✓	×	×
COLCHONES	✓	×	×
COMEDORES	✓	×	×
CONCENTRADO DE POLLO	✓	×	×
CONCENTRADOS PARA REFRESCOS	✓	×	×
CONJUNTO PARA MUJER	×	×	✓
CONSULTA MÉDICA	×	✓	✓
CORTE DE CABELLO	×	✓	✓
CORTES ESPECIALES DE RES	✓	×	×
CORTINAS	✓	×	×
CREMA DE LECHE	✓	×	×
CREMAS PARA LA PIEL	✓	×	×
CUADERNOS Y CARPETAS	✓	×	×
CUIDADO DENTAL	×	✓	✓
CUOTAS LICENCIAS Y OTROS DOCUMENTOS	×	✓	✓
DESODORANTES AMBIENTALES	✓	×	×
DESODORANTES PERSONALES	✓	×	×
DETERGENTES Y PRODUCTOS SIMILARES	✓	×	×
DISCOS Y CASETES	✓	×	×
DULCES Y CARAMELOS	✓	×	×
DURAZNO	×	✓	✓
ELECTRICIDAD	×	✓	✓
ELOTE	×	✓	✓
EQUIPOS MUDULARES	✓	×	×
ESCOBAS	✓	×	×
ESPECTÁCULOS DEPORTIVOS	×	✓	✓
ESTACIONAMIENTO	×	✓	✓
ESTUFAS	✓	×	×
EXPECTORANTES Y DESCONGESTIVOS	✓	×	×
FALDA PARA MUJER	×	×	✓
FÉCULA DE MAÍZ	✓	×	×
FERROCARRIL	×	✓	✓
FOCOS	✓	×	×
FRIJOL	✓	×	×
FRUTAS Y LEGUMBRES PREPARADAS PARA BEBÉS	✓	×	×
GALLETAS POPULARES	✓	×	×
GAS DOMÉSTICO	×	✓	✓
GASOLINA	×	✓	✓
GASTROINTESTINALES	✓	×	×
GELATINA EN POLVO	✓	×	×
GUAYABA	×	✓	✓
HARINA DE MAÍZ	✓	×	×
HARINAS DE TRIGO	✓	×	×
HELADOS	✓	×	×
HÍGADO DE RES	✓	×	×
HILOS Y ESTAMBRES	✓	×	×
HOSPITALIZACIÓN	×	✓	✓
HOTELES	×	✓	✓
HUACHINANGO	✓	×	×
HUARACHES Y SANDALIAS	×	×	✓
HUEVO	×	✓	✓
INSTRUMENTOS MUSICALES Y OTROS	×	✓	✓
JABÓN DE TOCADOR	✓	×	×
JABÓN PARA LAVAR	✓	×	×
JAMÓN	✓	×	×
JARDÍN DE NIÑOS Y GUARDERÍA	×	✓	✓
JITOMATE	×	✓	✓
JOYAS Y BISUTERÍA	×	×	✓
JUGOS O NÉCTARES ENVASADOS	✓	×	×
JUGUETES	✓	×	×
LAVADORAS DE ROPA	✓	×	×
LECHE CONDENSADA	✓	×	×

Table A.10: Store Price Product Groups - continued

Store Price Product Group	Estimation Sample	Services or Unprocessed Product Groups	Not Barcode Equivalent Price Information
LECHE EN POLVO	✓	×	×
LECHE EVAPORADA	✓	×	×
LECHE MATERNIZADA	✓	×	×
LECHE PASTEURIZADA ENVASADA	✓	×	×
LECHE SIN ENVASAR	×	✓	✓
LECHUGA	×	✓	✓
LIBROS DE TEXTO	✓	×	×
LICUADORAS	✓	×	×
LIMÓN	×	✓	✓
LOCIONES Y PERFUMES	✓	×	×
LOMO	✓	×	×
LONCHERÍAS	×	✓	✓
LOZA Y CRISTALERÍA	✓	×	×
MAÍZ	×	✓	✓
MANGO	×	✓	✓
MANTECA DE CERDO	✓	×	×
MANTECA VEGETAL	✓	×	×
MANTENIMIENTO DE AUTOMÓVIL	×	✓	✓
MANTEQUILLA	✓	×	×
MANZANA	×	✓	✓
MAQUINAS DE COSER	✓	×	×
MARGARINA	✓	×	×
MASA DE MAÍZ	✓	×	×
MATERIAL Y APARATOS FOTOGRÁFICOS	×	✓	✓
MAYONESA	✓	×	×
MEDIAS Y PANTIMEDIAS	×	×	✓
MELÓN	×	✓	✓
MERMELADAS	✓	×	×
METRO O TRANSPORTE ELÉCTRICO	×	✓	✓
MIEL DE ABEJA	✓	×	×
MOJARRA	✓	×	×
MOSTAZA	✓	×	×
MUEBLES PARA COCINA	×	×	✓
NARANJA	×	✓	✓
NAVAJAS Y MAQUINAS DE AFEITAR	×	✓	✓
NEUMÁTICOS	✓	×	×
NUTRICIONALES	✓	×	×
OPERACIÓN QUIRÚRGICA Y PARTOS	×	✓	✓
OTRAS CONSERVAS DE FRUTAS	✓	×	×
OTRAS GALLETAS	✓	×	×
OTRAS LEGUMBRES SECAS	×	✓	✓
OTRAS PRENDAS PARA HOMBRE	×	×	✓
OTRAS PRENDAS PARA MUJER	×	×	✓
OTRAS REFACCIONES	×	✓	✓
OTRAS VÍSCERAS DE RES	✓	×	×
OTROS COMBUSTIBLES	×	✓	✓
OTROS EMBUTIDOS	✓	×	×
OTROS LIBROS	✓	×	×
OTROS LICORES	✓	×	×
OTROS MARISCOS	✓	×	×
OTROS PESCADOS	✓	×	×
OTROS PESCADOS Y MARISCOS EN CONSERVA	✓	×	×
OTROS PLÁTANOS	×	✓	✓
OTROS QUESOS	✓	×	×
PAN BLANCO	×	✓	✓
PAN DE CAJA	✓	×	×
PAN DULCE	×	✓	✓
PAÑALES	✓	×	×
PANTALÓN HOMBRE BASE ALGODÓN	×	×	✓
PANTALÓN HOMBRE OTROS MATERIALES	×	×	✓
PANTALÓN MUJER BASE ALGODÓN	×	×	✓
PANTALÓN MUJER OTROS MATERIALES	×	×	✓
PANTALÓN NIÑO BASE ALGODÓN	×	×	✓
PANTALÓN NIÑO OTROS MATERIALES	×	×	✓
PAPA	×	✓	✓

Table A.10: Store Price Product Groups - continued

Store Price Product Group	Estimation Sample	Services or Unprocessed Product Groups	Not Barcode Equivalent Price Information
PAPAS FRITAS Y SIMILARES	×	✓	✓
PAPAYA	×	✓	✓
PAPEL HIGIÉNICO	✓	×	×
PASTA DENTAL	✓	×	×
PASTA PARA SOPA	✓	×	×
PASTEL DE CARNE	✓	×	×
PASTELILLOS Y PASTELES	×	✓	✓
PEPINO	×	✓	✓
PERA	×	✓	✓
PERIÓDICOS	✓	×	×
PIERNA	✓	×	×
PIMIENTA	✓	×	×
PIÑA	×	✓	✓
PLANCHAS ELÉCTRICAS	✓	×	×
PLÁTANO TABASCO	×	✓	✓
PLUMAS, LÁPICES Y OTROS	✓	×	×
POLLO EN PIEZAS	✓	×	×
POLLO ENTERO	✓	×	×
POLLOS ROSTIZADOS	×	✓	✓
PREPARATORIA	×	✓	✓
PRIMARIA	×	✓	✓
PRODUCTOS PARA EL CABELLO	✓	×	×
PULPA DE CERDO	✓	×	×
PURÉ DE TOMATE	✓	×	×
QUESO AMARILLO	✓	×	×
QUESO CHIHUAHUA O MANCHEGO	✓	×	×
QUESO FRESCO	✓	×	×
RADIOS Y GRABADORAS	✓	×	×
RECAMARAS	✓	×	×
REFRESCOS ENVASADOS	✓	×	×
REFRIGERADORES	✓	×	×
RELOJES	×	×	✓
RENTA DE VIVIENDA	×	✓	✓
REPARACIÓN DE CALZADO	×	✓	✓
RESTAURANTES, BARES Y SIMILARES	×	✓	✓
RETAZO	✓	×	×
REVISTAS	✓	×	×
ROBALO Y MERO	✓	×	×
RON	✓	×	×
ROPA INTERIOR PARA MUJER	×	×	✓
ROPA INTERIOR PARA NIÑA	×	×	✓
ROPA INTERIOR PARA NIÑO	×	×	✓
SABANAS	✓	×	×
SAL	✓	×	×
SALA DE BELLEZA	×	✓	✓
SALAS	✓	×	×
SALCHICHAS	✓	×	×
SANDÍA	×	✓	✓
SARDINA EN LATA	✓	×	×
SECUNDARIA	×	✓	✓
SEGURO DE AUTOMÓVIL	×	✓	✓
SERVICIO DE BAÑO	×	✓	✓
SERVICIO DE TINTORERÍA Y LAVANDERÍA	×	✓	✓
SERVICIO DOMÉSTICO	×	✓	✓
SERVICIOS FUNERARIOS	×	✓	✓
SERVILLETAS DE PAPEL	✓	×	×
SOMBREROS	✓	×	×
SOPAS ENLATADAS	✓	×	×
SUÉTER PARA NIÑA	×	×	✓
SUÉTER PARA NIÑO	×	×	✓
TAXI	×	✓	✓
TELEVISORES Y VIDEOCASETERAS	✓	×	×
TENENCIA DE AUTOMÓVIL	×	✓	✓
TEQUILA	✓	×	×
TOALLAS	✓	×	×

Table A.10: Store Price Product Groups - continued

Store Price Product Group	Estimation Sample	Services or Unprocessed Product Groups	Not Barcode Equivalent Price Information
TOALLAS SANITARIAS	✓	×	×
TOCINO	✓	×	×
TOMATE VERDE	×	✓	✓
TORONJA	×	✓	✓
TORTILLA DE MAÍZ	×	×	✓
TRAJE PARA BEBÉ	×	×	✓
TRAJES	×	×	✓
TRANSPORTE AÉREO	×	✓	✓
UNIFORME PARA NIÑA	✓	×	×
UNIFORME PARA NIÑO	✓	×	×
UNIVERSIDAD	×	✓	✓
UTENSILIOS DE PLÁSTICO PARA EL HOGAR	✓	×	×
UVA	×	✓	✓
VELAS Y VELADORAS	✓	×	×
VERDURAS ENVASADAS	✓	×	×
VESTIDO PARA MUJER	×	×	✓
VESTIDO PARA NIÑA	×	×	✓
VINO DE MESA	✓	×	×
YOGHURT	✓	×	×
ZANAHORIA	×	✓	✓
ZAPATOS PARA HOMBRE	×	×	✓
ZAPATOS PARA MUJER	×	×	✓
ZAPATOS PARA NIÑOS	×	×	✓
ZAPATOS TENIS	×	×	✓

Table A.11: Store Product Group Concordance

Store Product Group	Mexican IO Table Ouput Sector (4-Digit)	Colombian IO Table Output Sector (5-8 Digits)	Mexican Plant Data Sector (6-Digit)
ACEITE VEGETAL	MOLIENDA DE GRANOS Y DE SEMILLAS OLEAGINOSAS	ACEITE DE PALMISTE	FABRICACION DE ACEITES Y GRASAS VEGETALES COMESTIBLES
ACUMULADORES	FABRICACIÓN DE PARTES PARA VEHÍCULOS AUTOMOTORES	PARTES Y ACCESORIOS PARA CAJAS DE VELOCIDAD	FABRICACION DE ACUMULADORES Y PILAS ELECTRICAS
ANALGÉSICOS	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
ANTECOMEDORES	FABRICACIÓN DE MUEBLES, EXCEPTO DE OFICINA Y ESTANTERÍA	FABRICACIÓN DE MUEBLES PARA EL HOGAR	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
ANTIBIÓTICOS	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
ANTICONCEPTIVOS Y HORMONALES	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
ANTIGRIPALES	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
ARROZ	OTRAS INDUSTRIAS ALIMENTARIAS	TRILLA - PILADO - DE ARROZ	BENEFICIO DE ARROZ
ARTÍCULOS DE MAQUILLAJE	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	PRODUCTOS SÓLIDOS PARA MAQUILLAJE	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
ARTÍCULOS DEPORTIVOS	OTRAS INDUSTRIAS MANUFACTURERAS	FABRICACIÓN DE CALZADO DEPORTIVO DE CUERO	FABRICACION DE ROPA EXTERIOR DE PUNTO Y OTROS ARTICULOS
ATÚN EN LATA	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
AZÚCAR	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	FABRICACIÓN Y REFINACIÓN DE AZÚCAR	ELABORACION DE AZUCAR Y PRODUCTOS RESIDUALES DE LA CAÑA
BICICLETAS	FABRICACIÓN DE OTRO EQUIPO DE TRANSPORTE	FABRICACIÓN DE VELOCÍPEDOS-BICICLETAS, TRICICLOS Y VEHÍCULOS	FABRICACION Y ENSAMBLE DE MOTOCICLETAS, BICICLETAS Y SIMILARES
BISTEC DE RES	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE VACUNA FRESCA	CONGELACION Y EMPACADO DE CARNE FRESCA
BLANQUEADORES Y LIMPIADORES	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	PRODUCTOS BLANQUEADORES Y DESMANCHADORES	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
BRANDY	INDUSTRIA DE LAS BEBIDAS	BRANDY	ELABORACION DE BEBIDAS DESTILADAS DE UVA
CAFÉ SOLUBLE	OTRAS INDUSTRIAS ALIMENTARIAS	TRILLA DE CAFÉ	ELABORACION DE CAFE SOLUBLE
CAFÉ TOSTADO	OTRAS INDUSTRIAS ALIMENTARIAS	TRILLA DE CAFÉ	BENEFICIO DE CAFE
CAJETAS	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	DULCES Y CHUPETAS	FABRICACION DE CHICLES Y DULCES
CALENTADORES PARA AGUA	FABRICACIÓN DE APARATOS ELÉCTRICOS DE USO DOMÉSTICO	FABRICACIÓN DE APARATOS ELÉCTRICOS PARA COCINAR, EXCEPTO	FABRICACION Y REPARACION DE QUEMADORES Y CALENTADORES
CAMARÓN	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS
CARNE MOLIDA DE RES	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE VACUNA FRESCA	CONGELACION Y EMPACADO DE CARNE FRESCA
CARNES AHUMADAS O ENCHILADAS	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNES FRÍAS PREPARADAS, NO EMBUTIDAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
CARNES SECAS	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNES FRÍAS PREPARADAS, EMBUTIDAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
CEREALES EN HOJUELA	ELABORACIÓN DE PRODUCTOS DE PANADERÍA Y TORTILLAS	CEREALES EXPANDIDOS	PANADERIA Y PASTELERIA INDUSTRIAL
CERILLOS	OTRAS INDUSTRIAS MANUFACTURERAS	FÓSFOROS O CERILLAS	FABRICACION DE CERILLOS
CERVEZA	INDUSTRIA DE LAS BEBIDAS	CERVEZA TIPO PILSEN	CERVEZA
CHILES PROCESADOS	CONSERVACIÓN DE FRUTAS, VERDURAS Y GUISOS	PREPARACIÓN Y ENVASE DE ENCURTIDOS Y SALSAS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
CHOCOLATE EN POLVO	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	FABRICACIÓN DE CONFITES CON CHOCOLATE	ELABORACION DE COCOA Y CHOCOLATE DE MESA
CHOCOLATE EN TABLETA	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	FABRICACIÓN DE CONFITES CON CHOCOLATE	ELABORACION DE COCOA Y CHOCOLATE DE MESA
CHORIZO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CHORIZOS YONGANIZAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
CHULETA	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	MATANZA DE GANADO MAYOR CON O SIN FRIGORÍFICO	CONGELACION Y EMPACADO DE CARNE FRESCA
CIGARRILLOS	INDUSTRIA DEL TABACO	CIGARROS	BENEFICIO DE TABACO
COBIJAS	CONFECCIÓN DE ALFOMBRAS, BLANCOS Y SIMILARES	COBIJAS DE ALGODÓN	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
COLCHAS	CONFECCIÓN DE ALFOMBRAS, BLANCOS Y SIMILARES	TEJIDOS PLANOS DE FIBRAS SINTÉTICAS MEZCLADOS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
COLCHONES	CONFECCIÓN DE ALFOMBRAS, BLANCOS Y SIMILARES	COLCHONES DE ESPUMA	FABRICACION DE COLCHONES
COMEDORES	FABRICACIÓN DE MUEBLES, EXCEPTO DE OFICINA Y ESTANTERÍA	FABRICACIÓN DE MUEBLES PARA EL HOGAR	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
CONCENTRADO DE POLLO	OTRAS INDUSTRIAS ALIMENTARIAS	PREPARACIÓN Y ENVASE DE ENCURTIDOS Y SALSAS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
CONCENTRADOS PARA REFRESCOS	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	POLVOS PARA REFRESCOS, HELADOS Y PALETAS	ELABORACION DE CONCENTRADOS, JARABES Y COLORANTES NATURALES PARA ALIMENTOS
CORTES ESPECIALES DE RES	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE VACUNA FRESCA	CONGELACION Y EMPACADO DE CARNE FRESCA
CORTINAS	CONFECCIÓN DE ALFOMBRAS, BLANCOS Y SIMILARES	CORTINAS Y COLGADURAS DE TELA	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
CREMA DE LECHE	ELABORACIÓN DE PRODUCTOS LÁCTEOS	PASTEURIZACIÓN, HOMOGENIZACIÓN, VITAMINIZACIÓN Y EMBOTELLADO DE LECHE	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
CREMAS PARA LA PIEL	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	CREMA DE TOCADOR	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
CUADERNOS Y CARPETAS	IMPRESIÓN E INDUSTRIAS CONEXAS	ENCUADERNACIÓN	IMPRESION Y ENCUADERNACION
DESODORANTES AMBIENTALES	FABRICACIÓN DE OTROS PRODUCTOS QUÍMICOS	INSECTICIDAS Y FUNGICIDASÍQUIDOS PARA USO VEGETAL	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
DESODORANTES PERSONALES	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	AGUAS DE COLONIA	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
DETERGENTES Y PRODUCTOS SIMILARES	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	DETERGENTESÍQUIDOS	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
DISCOS Y CASETES	FABRICACIÓN DE EQUIPO DE AUDIO Y DE VIDEO	REPRODUCCIÓN DE DISCOS DE GRAMOFONO, CINTAS MAGNETOFONICAS	FABRICACION DE DISCOS Y CINTAS MAGNETOFONICAS

Table A.11: Store Product Group Concordance - continued

Store Product Group	Mexican IO Table Ouput Sector (4-Digit)	Colombian IO Table Output Sector (5-8 Digits)	Mexican Plant Data Sector (6-Digit)
DULCES Y CARAMELOS	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	DULCES Y CHUPETAS	FABRICACION DE CHICLES Y DULCES
EQUIPOS MUDULARES	FABRICACIÓN DE EQUIPO DE AUDIO Y DE VIDEO	FABRICACIÓN DE RADIORRECEPTORES, TELEVISORES, GRAMÓFONOS	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
ESCOBAS	OTRAS INDUSTRIAS MANUFACTURERAS	ESCOBAS DE CUALQUIER MATERIAL	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
ESTUFAS	FABRICACIÓN DE SISTEMAS DE CALEFACCIÓN Y DE REFRIGERACIÓN INDUSTRIAL Y COMERCIAL	ESTUFAS - COCINAS - DE GAS DOMÉSTICAS	FABRICACION Y ENSAMBLE DE ESTUFAS Y HORNOS DE USO DOMESTICO
EXPECTORANTES Y DESCONGESTIVOS	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
FÉCULA DE MAÍZ	OTRAS INDUSTRIAS ALIMENTARIAS	FÉCULAS DE CEREALES	ELABORACION DE ALMIDONES, FECULAS Y LEVADURAS
FOCOS	FABRICACIÓN DE ACCESORIOS DE ILUMINACIÓN	OTRAS INDUSTRIAS	FABRICACION DE FOCOS, TUBOS Y BOMBILLAS PARA ILUMINACION
FRIJOL	OTRAS INDUSTRIAS ALIMENTARIAS	ELABORACIÓN DE PRODUCTOS ALIMENTICIOS NO CLASIFICADOS ANTES	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
FRUTAS Y LEGUMBRES PREPARADAS PARA BEBÉS	CONSERVACIÓN DE FRUTAS, VERDURAS Y GUISOS	PREPARACIÓN DE MEZCLAS PARA ALIMENTACIÓN INFANTIL	ELABORACION DE SOPAS Y GUISOS PREPARADOS
GALLETAS POPULARES	OTRAS INDUSTRIAS ALIMENTARIAS	GALLETAS	ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS
GASTROINTESTINALES	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
GELATINA EN POLVO	OTRAS INDUSTRIAS ALIMENTARIAS	GELATINA NEUTRA - POTABLE	ELABORACION DE GELATINAS, FLANES Y POSTRES EN POLVO PARA PREPARAR EN EL HOGAR
HARINA DE MAÍZ	MOLIENDA DE GRANOS Y DE SEMILLAS OLEAGINOSAS	HARINA DE MAÍZ	ELABORACION DE HARINA DE MAIZ
HARINAS DE TRIGO	MOLIENDA DE GRANOS Y DE SEMILLAS OLEAGINOSAS	HARINAS FINAS DE TRIGO	MOLIENDA DE TRIGO
HELADOS	ELABORACIÓN DE PRODUCTOS LÁCTEOS	FABRICACIÓN DE HIELO Y PREPARACIÓN DE HELADOS	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
HÍGADO DE RES	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE VACUNA FRESCA	CONGELACION Y EMPACADO DE CARNE FRESCA
HILOS Y ESTAMBRES	PREPARACIÓN E HILADO DE FIBRAS TEXTILES Y FABRICACIÓN DE HILOS	HILOS DE FIBRAS SINTÉTICAS, DISCONTINUAS	FABRICACION DE HILO PARA COSER, BORDAR Y TEJER
HUACHINANGO	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
JABÓN DE TOCADOR	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	JABONES DE TOCADOR	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
JABÓN PARA LAVAR	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	JABONES EN PASTA PARAAVAR	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
JAMÓN	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	JAMÓN	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
JUGOS O NÉCTARES ENVASADOS	INDUSTRIA DE LAS BEBIDAS	JUGOS DE FRUTAS ENVASADOS	ELABORACION DE REFRESCOS Y OTRAS BEBIDAS NO ALCOHOLICAS
JUGUETES	OTRAS INDUSTRIAS MANUFACTURERAS	JUGUETERÍA DE MATERIAL PLÁSTICO	FABRICACION DE JUGUETES DE PLASTICO
LAVADORAS DE ROPA	FABRICACIÓN DE APARATOS ELÉCTRICOS DE USO DOMÉSTICO	FABRICACIÓN DE APARATOS ELECTRICOS DEIMPIEZA Y DE PLANCHAR ELÉCTRICOS	FABRICACION Y ENSAMBLE DE LAVADORAS Y SECADORAS DE USO DOMESTICO
LECHE CONDENSADA	ELABORACIÓN DE PRODUCTOS LÁCTEOS	PRODUCCIÓN DEECHES Y PRODUCTOS ÁCTEOS	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE EN POLVO	ELABORACIÓN DE PRODUCTOS LÁCTEOS	LECHE EN POLVO ENTERA	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE EVAPORADA	ELABORACIÓN DE PRODUCTOS LÁCTEOS	LECHE EN POLVO ENTERA	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE MATERNIZADA	ELABORACIÓN DE PRODUCTOS LÁCTEOS	LECHE EN POLVO ENTERA	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE PASTEURIZADA ENVASADA	ELABORACIÓN DE PRODUCTOS LÁCTEOS	PASTEURIZACIÓN, HOMOGENIZACIÓN, VITAMINIZACIÓN Y EMBOTELLADO DE LECHE	TRATAMIENTO Y ENVASADO DE LECHE
LIBROS DE TEXTO	IMPRESIÓN E INDUSTRIAS CONEXAS	ENCUADERNACIÓN	EDICION DE LIBROS Y SIMILARES
LICUADORAS	FABRICACIÓN DE APARATOS ELÉCTRICOS DE USO DOMÉSTICO	FABRICACIÓN DE APARATOS ELÉCTRICOS PARA COCINAR, EXCEPTO	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
LOCIONES Y PERFUMES	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	AGUAS DE COLONIA	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
LOMO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	MATANZA DE GANADO MAYOR CON O SIN FRIGORÍFICO	CONGELACION Y EMPACADO DE CARNE FRESCA
LOZA Y CRISTALERÍA	FABRICACIÓN DE VIDRIO Y PRODUCTOS DE VIDRIO	FIGURAS DECORATIVAS Y ARTÍSTICAS DEOZA O PORCELANA	INDUSTRIA ARTESANAL DE ARTICULOS DE VIDRIO
MANTECA DE CERDO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	ENVASE DE CARNES EN CONSERVA EN RECIPIENTES	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
MANTECA VEGETAL	OTRAS INDUSTRIAS ALIMENTARIAS	PRODUCCIÓN DE ACEITES Y GRASAS VEGETALES	FABRICACION DE ACEITES Y GRASAS VEGETALES COMESTIBLES
MANTEQUILLA	ELABORACIÓN DE PRODUCTOS LÁCTEOS	PRODUCCIÓN DE LECHES Y PRODUCTOS LÁCTEOS	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
MAQUINAS DE COSER	FABRICACIÓN DE APARATOS ELÉCTRICOS DE USO DOMÉSTICO	FABRICACIÓN DE MUEBLES PARA APARATOS ELECTRICOS, MÁQUINAS DE COSER Y OTROS	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
MARGARINA	OTRAS INDUSTRIAS ALIMENTARIAS	MARGARINA	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
MASA DE MAÍZ	OTRAS INDUSTRIAS ALIMENTARIAS	PRODUCCIÓN DE HARINA DE MAÍZ Y PILADO DE MAÍZ	ELABORACION DE HARINA DE MAIZ
MAYONESA	OTRAS INDUSTRIAS ALIMENTARIAS	PREPARACIÓN Y ENVASE DE ENCURTIDOS Y SALSAS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
MERMELADAS	OTRAS INDUSTRIAS ALIMENTARIAS	PREPARACIÓN Y ENVASE DE MERMELADAS Y JALEAS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
MIEL DE ABEJA	ELABORACIÓN DE AZÚCAR, CHOCOLATES, DULCES Y SIMILARES	FABRICACIÓN DE CONFITES	ELABORACION DE OTROS PRODUCTOS ALIMENTICIOS PARA CONSUMO HUMANO
MOJARRA	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS

Table A.11: Store Product Group Concordance - continued

Store Product Group	Mexican IO Table Ouput Sector (4-Digit)	Colombian IO Table Output Sector (5-8 Digits)	Mexican Plant Data Sector (6-Digit)
MOSTAZA	OTRAS INDUSTRIAS ALIMENTARIAS	CONDIMENTOS COMPUESTOS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
NEUMÁTICOS	FABRICACIÓN DE PRODUCTOS DE HULE	FABRICACIÓN DE AUTOPARTES NO INCLUIDOS ANTES	FABRICACION DE PIEZAS Y ARTICULOS DE HULE NATURAL O SINTETICO
NUTRICIONALES	FABRICACIÓN DE PRODUCTOS FARMACÉUTICOS	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
OTRAS CONSERVAS DE FRUTAS	CONSERVACIÓN DE FRUTAS, VERDURAS Y GUISOS	FRUTAS EN CONSERVA ENVASADAS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
OTRAS GALLETAS	OTRAS INDUSTRIAS ALIMENTARIAS	BIZCOCHOS Y PASTELES DE DULCE	ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS
OTRAS VÍSCERAS DE RES	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE VACUNA FRESCA	CONGELACION Y EMPACADO DE CARNE FRESCA
OTROS EMBUTIDOS	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	SALCHICHAS ENVASADAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
OTROS LIBROS	IMPRESIÓN E INDUSTRIAS CONEXAS	ENCUADERNACIÓN	EDICION DE LIBROS Y SIMILARES
OTROS LICORES	INDUSTRIA DE LAS BEBIDAS	DESTILACIÓN, RECTIFICACIÓN Y MEZCLAS DE BEBIDAS ALCOHÓLICAS	ELABORACION DE BEBIDAS DESTILADAS DE CAÑA
OTROS MARISCOS	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS
OTROS PESCADOS	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS
OTROS PESCADOS Y MARISCOS EN CONSERVA	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
OTROS QUESOS	ELABORACIÓN DE PRODUCTOS LÁCTEOS	QUESO BLANDO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
PAN DE CAJA	ELABORACIÓN DE PRODUCTOS DE PANADERÍA Y TORTILLAS	PANADERÍA	PANADERIA Y PASTELERIA INDUSTRIAL
PAÑALES	CONFECCIÓN DE ACCESORIOS DE VESTIR	PRENDAS PARA BEBÉ	FABRICACION DE ALGODON ABSORBENTE, VENDAS Y SIMILARES
PAPEL HIGIÉNICO	FABRICACIÓN DE PRODUCTOS DE PAPEL Y CARTÓN	TOALLAS SANITARIAS	FABRICACION DE PAPEL
PASTA DENTAL	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	PRODUCTOS MEDICINALES Y FARMACÉUTICOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
PASTA PARA SOPA	OTRAS INDUSTRIAS ALIMENTARIAS	FIDEOS, MACARRONES Y SIMILARES	ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS
PASTEL DE CARNE	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	MORTADELA	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
PERIÓDICOS	IMPRESIÓN E INDUSTRIAS CONEXAS	PERIÓDICOS	EDICION DE PERIODICOS Y REVISTAS
PIERNA	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	MATANZA DE GANADO MAYOR CON O SIN FRIGORÍFICO	CONGELACION Y EMPACADO DE CARNE FRESCA
PIMIENTA	OTRAS INDUSTRIAS ALIMENTARIAS	CONDIMENTOS COMPUESTOS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
PLANCHAS ELÉCTRICAS	FABRICACIÓN DE APARATOS ELÉCTRICOS DE USO DOMÉSTICO	FABRICACIÓN DE APARATOS ELECTRICOS DEIMPIEZA Y DE PLANCHAR ELÉCTRICOS	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
PLUMAS, LÁPICES Y OTROS	FABRICACIÓN DE PRODUCTOS DE PLÁSTICO	FABRICACIÓN DE ARTÍCULOS DE PLÁSTICO PARA EL HOGAR	FABRICACION DE ARTICULOS Y UTILES PARA OFICINA, DIBUJO Y PINTURA ARTISTICA
POLLO EN PIEZAS	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE DE POLLO O GALLINA, SIN TROCEAR	MATANZA DE GANADO Y AVES
POLLO ENTERO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE DE POLLO O GALLINA, SIN TROCEAR	MATANZA DE GANADO Y AVES
PRODUCTOS PARA EL CABELLO	FABRICACIÓN DE JABONES, LIMPIADORES Y PREPARACIONES DE TOCADOR	CHAMPÚES	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
PULPA DE CERDO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	MATANZA DE GANADO MAYOR CON O SIN FRIGORÍFICO	CONGELACION Y EMPACADO DE CARNE FRESCA
PURÉ DE TOMATE	OTRAS INDUSTRIAS ALIMENTARIAS	SALSA DE TOMATE	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
QUESO AMARILLO	ELABORACIÓN DE PRODUCTOS LÁCTEOS	QUESO BLANDO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
QUESO CHIHUAHUA O MANCHEGO	ELABORACIÓN DE PRODUCTOS LÁCTEOS	QUESO BLANDO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
QUESO FRESCO	ELABORACIÓN DE PRODUCTOS LÁCTEOS	QUESO BLANDO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
RADIOS Y GRABADORAS	FABRICACIÓN DE EQUIPO DE AUDIO Y DE VIDEO	FABRICACIÓN DE RADIORRECEPTORES, TELEVISORES, GRAMÓFONOS	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
RECAMARAS	FABRICACIÓN DE MUEBLES, EXCEPTO DE OFICINA Y ESTANTERÍA	FABRICACIÓN DE MUEBLES PARA EL HOGAR	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
REFRESCOS ENVASADOS	INDUSTRIA DE LAS BEBIDAS	BEBIDAS GASEOSAS NO ALCOHÓLICAS	ELABORACION DE REFRESCOS Y OTRAS BEBIDAS NO ALCOHOLICAS
REFRIGERADORES	FABRICACIÓN DE APARATOS ELÉCTRICOS DE USO DOMÉSTICO	APARATOS FRIGORÍFICOS	FABRICACION Y ENSAMBLE DE REFRIGERADORES DE USO DOMESTICO
RETAZO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	CARNE VACUNA FRESCA	CONGELACION Y EMPACADO DE CARNE FRESCA
REVISTAS	IMPRESIÓN E INDUSTRIAS CONEXAS	REVISTAS	EDICION DE PERIODICOS Y REVISTAS
ROBALO Y MERO	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
RON	INDUSTRIA DE LAS BEBIDAS	RON	ELABORACION DE BEBIDAS DESTILADAS DE CAÑA
SABANAS	CONFECCIÓN DE ALFOMBRAS, BLANCOS Y SIMILARES	TEJIDOS PLANOS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
SAL	OTRAS INDUSTRIAS ALIMENTARIAS	SAL MINERALIZADA	ELABORACION DE SOPAS Y GUISOS PREPARADOS
SALAS	FABRICACIÓN DE MUEBLES, EXCEPTO DE OFICINA Y ESTANTERÍA	FABRICACIÓN DE MUEBLES PARA EL HOGAR	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
SALCHICHAS	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	SALCHICHAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
SARDINA EN LATA	PREPARACIÓN Y ENVASADO DE PESCADOS Y MARISCOS	PREPARACIÓN DE PESCADO Y OTROS ANIMALES MARINOS	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
SERVILLETAS DE PAPEL	FABRICACIÓN DE PRODUCTOS DE PAPEL Y CARTÓN	TOALLAS SANITARIAS	FABRICACION DE PAPEL

Table A.11: Store Product Group Concordance - continued

Store Product Group	Mexican IO Table Ouput Sector (4-Digit)	Colombian IO Table Output Sector (5-8 Digits)	Mexican Plant Data Sector (6-Digit)
SOMBREROS	CONFECCIÓN DE ACCESORIOS DE VESTIR	CUERO CURTIDO DELGADO DE GANADO VACUNO	CONFECCION DE ROPA EXTERIOR PARA CABALLERO HECHA EN SERIE
SOPAS ENLATADAS	CONSERVACIÓN DE FRUTAS, VERDURAS Y GUISOS	PREPARACIÓN Y ENVASE DE ENCURTIDOS Y SALSAS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
TELEVISORES Y VIDEOCASETERAS	FABRICACIÓN DE EQUIPO DE AUDIO Y DE VIDEO	FABRICACIÓN DE RADIORRECEPTORES, TELEVISORES, GRAMÓFONOS	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
TEQUILA	INDUSTRIA DE LAS BEBIDAS	DESTILACIÓN, RECTIFICACIÓN Y MEZCLAS DE BEBIDAS ALCOHÓLICAS	ELABORACION DE BEBIDAS DESTILADAS DE AGAVES
TOALLAS	CONFECCIÓN DE ACCESORIOS DE VESTIR	TOALLAS DE ALGODÓN	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
TOALLAS SANITARIAS	FABRICACIÓN DE PRODUCTOS DE PAPEL Y CARTÓN	TOALLAS SANITARIAS	FABRICACION DE PAPEL
TOCINO	MATANZA, EMPACADO Y PROCESAMIENTO DE CARNE DE GANADO Y AVES	MORTADELA	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
UNIFORME PARA NIÑA	CONFECCIÓN DE PRENDAS DE VESTIR	VESTIDOS DE TEJIDOS SINTÉTICOS PARA NIÑO	FABRICACION DE SUETERES
UNIFORME PARA NIÑO	CONFECCIÓN DE PRENDAS DE VESTIR	VESTIDOS DE TEJIDOS SINTÉTICOS PARA NIÑO	FABRICACION DE SUETERES
UTENSILIOS DE PLÁSTICO PARA EL HOGAR	FABRICACIÓN DE PRODUCTOS DE PLÁSTICO	VASOS Y JARROS DE MATERIAL PLÁSTICO	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
VELAS Y VELADORAS	OTRAS INDUSTRIAS MANUFACTURERAS	VELADORAS	OTRAS INDUSTRIAS
VERDURAS ENVASADAS	CONSERVACIÓN DE FRUTAS, VERDURAS Y GUISOS	PREPARACIÓN Y ENVASE DE ENCURTIDOS Y SALSAS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
VINO DE MESA	INDUSTRIA DE LAS BEBIDAS	VINO DE UVAS	VINIFICACION (ELABORACION DE BEBIDAS FERMENTADAS DE UVA)
YOGHURT	ELABORACIÓN DE PRODUCTOS LÁCTEOS	YOGHURT	ELABORACION DE CREMA, MANTEQUILLA Y QUESO

Table A.12: Household Consumption Product Groups

ENIGH Product Group	Mexican Plant Data (6-Digit)
ACEITE VEGETAL	FABRICACION DE ACEITES Y GRASAS VEGETALES COMESTIBLES
ACUMULADORES	FABRICACION DE ACUMULADORES Y PILAS ELECTRICAS
AGUJAS, CIERRES, BOTONES Y BROCHES	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
ALFOMBRAS Y TAPETES	HILADO Y TEJIDO DE HENEQUEN
AÑEJO Y COTIJA	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
ANTEOJOS Y LENTES DE CONTACTO	FABRICACION DE PRODUCTOS FARMACEUTICOS
ANTICONCEPTIVOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
APARATOS DE AIRE ACONDICIONADO	FABRICACION DE EQUIPOS Y APARATOS DE AIRE ACONDICIONADO, REFRIGERACION Y CALEFACCION
APARATOS PARA SORDERA	FABRICACION DE PRODUCTOS FARMACEUTICOS
ARROZ	BENEFICIO DE ARROZ
ARTÍCULOS DE MAQUILLAJE	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
ARTÍCULOS DE TOCADOR PARA BEBÉ	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
ARTÍCULOS DEPORTIVOS	FABRICACION DE ROPA EXTERIOR DE PUNTO Y OTROS ARTICULOS
ARTÍCULOS ELÉCTRICOS (RASURADORA, SECADORA, ETC.)	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
ASPIRADORA	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
ATÚN EN LATA	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
AUTOMÓVILES	FABRICACION Y ENSAMBLE DE AUTOMOVILES Y CAMIONES
AZÚCAR	ELABORACION DE AZUCAR Y PRODUCTOS RESIDUALES DE LA CAÑA
BATIDORA	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
BICICLETAS	FABRICACION Y ENSAMBLE DE MOTOCICLETAS, BICICLETAS Y SIMILARES
BISTEC DE RES	CONGELACION Y EMPACADO DE CARNE FRESCA
BLANQUEADORES Y LIMPIADORES	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
BLUSA PARA NIÑO	CONFECCION DE ROPA EXTERIOR PARA NIÑOS Y NIÑAS
BLUSAS PARA MUJER	CONFECCION DE ROPA EXTERIOR PARA DAMA HECHA EN SERIE
BOLSAS, MALETAS Y CINTURONES	FABRICACION DE PRODUCTOS DE CUERO, PIEL Y MATERIALES SUCEDANEOS
BRANDY	ELABORACION DE BEBIDAS DESTILADAS DE UVA
CABRITO	CONGELACION Y EMPACADO DE CARNE FRESCA
CAFÉ SIN TOSTAR (EN GRANO)	BENEFICIO DE CAFE
CAFÉ SOLUBLE	ELABORACION DE CAFE SOLUBLE
CAFÉ TOSTADO	BENEFICIO DE CAFE
CAJETAS	FABRICACION DE CHICLES Y DULCES
CALCETINES	FABRICACION DE MEDIAS Y CALCETINES
CALCETINES Y CALCETAS	FABRICACION DE MEDIAS Y CALCETINES
CALENTADOR DE GAS	FABRICACION Y REPARACION DE QUEMADORES Y CALENTADORES
CALENTADOR DE OTROS COMBUSTIBLES	FABRICACION Y REPARACION DE QUEMADORES Y CALENTADORES
CALZONCILLOS	FABRICACION DE ROPA INTERIOR DE PUNTO
CALZONES DE HULE	FABRICACION DE ROPA INTERIOR DE PUNTO
CALZONES DE TELA	FABRICACION DE ROPA INTERIOR DE PUNTO
CÁMARAS	FABRICACION DE PIEZAS Y ARTICULOS DE HULE NATURAL O SINTETICO
CAMARÓN	CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS
CAMISAS	CONFECCION DE CAMISAS
CAMISETA PARA BEBÉ	FABRICACION DE ROPA INTERIOR DE PUNTO
CAMISETAS	FABRICACION DE ROPA INTERIOR DE PUNTO
CANELA	ELABORACION DE SOPAS Y GUISOS PREPARADOS
CARNERO Y BORREGO	CONGELACION Y EMPACADO DE CARNE FRESCA
CARNES AHUMADAS O ENCHILADAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
CARNES SECAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
CEPILLO, PEINE Y CEPILLO DENTÍFRICO	FABRICACION DE PRODUCTOS FARMACEUTICOS
CEREALES EN HOJUELA	PANADERIA Y PASTELERIA INDUSTRIAL
CERILLOS	FABRICACION DE CERILLOS
CERVEZA	CERVEZA
CHAPULINES, GUSANO DE MAGUEY, ETC.	ELABORACION DE SOPAS Y GUISOS PREPARADOS
CHILES PROCESADOS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
CHOCOLATE EN TABLETA O EN POLVO	ELABORACION DE COCOA Y CHOCOLATE DE MESA
CHORIZO	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
CHULETA	CONGELACION Y EMPACADO DE CARNE FRESCA
CHULETA Y COSTILLA	CONGELACION Y EMPACADO DE CARNE FRESCA
CIGARRILLOS	BENEFICIO DE TABACO
COBIJAS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
COCINA INTEGRAL	FABRICACION Y ENSAMBLE DE ESTUFAS Y HORNOS DE USO DOMESTICO
COLCHAS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
COLCHONES	FABRICACION DE COLCHONES
CONCENTRADO DE POLLO	ELABORACION DE SOPAS Y GUISOS PREPARADOS
CONCENTRADOS PARA REFRESCOS	ELABORACION DE CONCENTRADOS, JARABES Y COLORANTES NATURALES PARA ALIMENTOS
CORTES ESPECIALES DE RES	CONGELACION Y EMPACADO DE CARNE FRESCA
CORTINAS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
CREMA DE LECHE	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
CREMAS PARA LA PIEL	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
CUBIERTOS	HILADO Y TEJIDO DE HENEQUEN
DESODORANTES AMBIENTALES	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
DESODORANTES PERSONALES	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
DETERGENTES Y PRODUCTOS SIMILARES	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
DISCOS Y CASETES	FABRICACION DE DISCOS Y CINTAS MAGNETOFONICAS
DULCES Y CARAMELOS	FABRICACION DE CHICLES Y DULCES
ENCENDEDORES, CIGARRERAS Y POLVERAS	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
EQUIPO ESCOLAR: MÁQUINAS DE ESCRIBIR, CALCULADORAS, ETC.	OTRAS INDUSTRIAS
EQUIPOS MUDULARES	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
ESCOBAS	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
ESTUFAS	FABRICACION Y ENSAMBLE DE ESTUFAS Y HORNOS DE USO DOMESTICO
EXTRACTOR DE JUGOS	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
FALDA PARA MUJER	CONFECCION DE ROPA EXTERIOR PARA DAMA HECHA EN SERIE
FÉCULA DE MAÍZ	ELABORACION DE ALMIDONES, FECULAS Y LEVADURAS
FIBRAS, ESTROPAJOS Y ESCOBETAS	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
FOCOS	FABRICACION DE FOCOS, TUBOS Y BOMBILLAS PARA ILUMINACION
FRIJOL	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
FRUTAS Y LEGUMBRES PREPARADAS PARA BEBÉS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
GALLETAS POPULARES	ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS

Table A.12: Household Consumption Product Groups - continued

ENIGH Product Group	Mexican Plant Data (6-Digit)
GELATINA EN POLVO	ELABORACION DE GELATINAS, FLANES Y POSTRES EN POLVO PARA PREPARAR EN EL HOGAR
HARINA DE MAÍZ	ELABORACION DE HARINA DE MAIZ
HARINA DE PAPA PARA PURÉ	ELABORACION DE SOPAS Y GUISOS PREPARADOS
HARINAS DE TRIGO	MOLIENDA DE TRIGO
HELADOS	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
HIERBAS MEDICINALES, AMULETOS Y REMEDIOS CASEROS	FABRICACION DE PRODUCTOS FARMACEUTICOS
HILOS Y ESTAMBRES	FABRICACION DE HILO PARA COSER, BORDAR Y TEJER
HOJAS PARA TÉ (MANZANILLA, NARANJA, ETC.)	ELABORACION DE CAFE SOLUBLE
HUACHINANGO	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
INSECTICIDAS	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
JABÓN DE TOCADOR	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
JABÓN PARA LAVAR	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
JAMÓN	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
JARABES, TÓNICOS Y BREBAJES	FABRICACION DE PRODUCTOS FARMACEUTICOS
JERGAS Y TRAPOS DE COCINA	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
JUEGO DE COMEDOR O ANTECOMEDOR	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
JUEGOS ELECTRÓNICOS, VIDEOJUEGO	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
JUGOS O NÉCTARES ENVASADOS	ELABORACION DE REFRESCOS Y OTRAS BEBIDAS NO ALCOHOLICAS
JUGUETES	FABRICACION DE JUGUETES DE PLASTICO
LÁMPARAS DE OTROS COMBUSTIBLES	FABRICACION DE FOCOS, TUBOS Y BOMBILLAS PARA ILUMINACION
LÁMPARAS ELÉCTRICAS	FABRICACION DE FOCOS, TUBOS Y BOMBILLAS PARA ILUMINACION
LAVADORAS DE ROPA	FABRICACION Y ENSAMBLE DE LAVADORAS Y SECADORAS DE USO DOMESTICO
LECHE CONDENSADA	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE EN POLVO	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE EVAPORADA	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE MATERNIZADA	ELABORACION DE LECHE CONDENSADA, EVAPORADA Y EN POLVO
LECHE PASTEURIZADA ENVASADA	TRATAMIENTO Y ENVASADO DE LECHE
LECHE SIN ENVASAR	TRATAMIENTO Y ENVASADO DE LECHE
LIBROS DE TEXTO	EDICION DE LIBROS Y SIMILARES
LICUADORAS	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
LOCIONES Y PERFUMES	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
LOMO Y FILETE	CONGELACION Y EMPACADO DE CARNE FRESCA
LOMO Y PIERNA	CONGELACION Y EMPACADO DE CARNE FRESCA
LOZA Y CRISTALERÍA	INDUSTRIA ARTESANAL DE ARTICULOS DE VIDRIO
MANTECA DE CERDO	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
MANTECA VEGETAL	FABRICACION DE ACEITES Y GRASAS VEGETALES COMESTIBLES
MANTELES Y SERVILLETAS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
MANTEQUILLA	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
MAQUINAS DE COSER	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
MARGARINA	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
MASA DE MAÍZ	ELABORACION DE HARINA DE MAIZ
MATERIAL ESCOLAR: CUADERNOS, CARPETAS, ETC.	IMPRESION Y ENCUADERNACION
MATERIAL FOTOGRÁFICO, PELÍCULAS, LENTES, ETC.	FABRICACION DE PELICULAS, PLACAS Y PAPEL SENSIBLE PARA FOTOGRAFIA
MATERIAL PARA PRIMEROS AUXILIOS (ALGODÓN, GASA, JERINGAS, ETC.)	FABRICACION DE PRODUCTOS FARMACEUTICOS
MATERIALES PARA REPARACIÓN Y MANTENIMIENTO	FABRICACION DE PINTURAS, BARNICES, LACAS Y SIMILARES
MAYONESA	ELABORACION DE SOPAS Y GUISOS PREPARADOS
MEDIAS Y PANTIMEDIAS	FABRICACION DE MEDIAS Y CALCETINES
MEDICAMENTOS RECETADOS	FABRICACION DE PRODUCTOS FARMACEUTICOS
MERMELADAS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
MIEL DE ABEJA	ELABORACION DE OTROS PRODUCTOS ALIMENTICIOS PARA CONSUMO HUMANO
MOJARRA	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
MOLE	ELABORACION DE SOPAS Y GUISOS PREPARADOS
MOSTAZA	ELABORACION DE SOPAS Y GUISOS PREPARADOS
MOTONETA Y MOTOCICLETA	FABRICACION Y ENSAMBLE DE MOTOCICLETAS, BICICLETAS Y SIMILARES
MUEBLES PARA COCINA	FABRICACION Y ENSAMBLE DE ESTUFAS Y HORNOS DE USO DOMESTICO
NIXTAMAL Y OTROS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
OAXACA Y ASADERO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
OBJETOS ORNAMENTALES	INDUSTRIA ARTESANAL DE ARTICULOS DE VIDRIO
OTRAS AVES: PAVO, PICHÓN, PATO, ETC.	MATANZA DE GANADO Y AVES
OTRAS CONSERVAS DE FRUTAS	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
OTRAS GALLETAS	ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS
OTRAS PRENDAS PARA BEBÉ: BABEROS, DELANTALES, FAJILLAS, ETC.	FABRICACION DE ROPA INTERIOR DE PUNTO
OTRAS PRENDAS PARA HOMBRE	FABRICACION DE ROPA INTERIOR DE PUNTO
OTRAS PRENDAS PARA MUJER	FABRICACION DE ROPA INTERIOR DE PUNTO
OTRAS REFACCIONES	FABRICACION DE OTRAS PARTES Y ACCESORIOS PARA AUTOMOVILES Y CAMIONES
OTRAS VÍSCERAS DE RES	CONGELACION Y EMPACADO DE CARNE FRESCA
OTRAS: CABRA, BURRA, ETC.	TRATAMIENTO Y ENVASADO DE LECHE
OTRAS: GLASS, MOSCABADA, PILONCILLO, MIEL DE MAÍZ, ETC.	ELABORACION DE BOTANAS Y PRODUCTOS DE MAIZ NO MENCIONADOS ANTERIORMENTE
OTRAS: VISERAS, (HÍGADO, RIÑONES, ETC.), LENGUA, MANITAS, ETC.	CONGELACION Y EMPACADO DE CARNE FRESCA
OTROS APARATOS: ORTOPÉDICOS (MULETAS, SILLAS DE RUEDAS, ETC.)	FABRICACION DE PRODUCTOS FARMACEUTICOS
OTROS APARATOS: TOSTADOR, CALEFACTOR, ETC.	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
OTROS ARTÍCULOS	FABRICACION DE JABONES, DETERGENTES Y DENTIFRICOS
OTROS ARTÍCULOS: PINTURAS, PLANTAS, FLORES, ETC.	FABRICACION DE ARTICULOS Y UTILES PARA OFICINA, DIBUJO Y PINTURA ARTISTICA
OTROS CEREALES: CENTENO, CEBADA, ETC.	ELABORACION DE BOTANAS Y PRODUCTOS DE MAIZ NO MENCIONADOS ANTERIORMENTE
OTROS CONDIMENTOS: ADEREZOS, ABLANDADORES, ETC.	ELABORACION DE SOPAS Y GUISOS PREPARADOS
OTROS EMBUTIDOS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
OTROS LIBROS	EDICION DE LIBROS Y SIMILARES
OTROS LICORES	ELABORACION DE BEBIDAS DESTILADAS DE CAÑA
OTROS MARISCOS	CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS
OTROS MEDICAMENTOS SIN RECETA (ASPIRINAS, DESENFRIOLES, ETC.)	FABRICACION DE PRODUCTOS FARMACEUTICOS
OTROS MUEBLES Y ACCESORIOS: VITRINAS, CABECERAS, ETC.	HILADO Y TEJIDO DE HENEQUEN
OTROS PESCADOS	CONGELACION Y EMPAQUE DE PESCADOS Y MARISCOS FRESCOS
OTROS QUESOS	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
OTROS TIPOS DE CALZADO: SANDALIAS, TENIS, ETC.	FABRICACION DE CALZADO PRINCIPALMENTE DE CUERO
OTROS: ACEITE DE OLIVA, ENJUNDIA, ETC.	FABRICACION DE ACEITES Y GRASAS VEGETALES COMESTIBLES
OTROS: CHILACAYOTE, COCADA, VISNAGA, ALEGRÍAS, ETC.	ELABORACION DE SOPAS Y GUISOS PREPARADOS
OTROS: COCOA, ETC.	ELABORACION DE SOPAS Y GUISOS PREPARADOS

Table A.12: Household Consumption Product Groups - continued

ENIGH Product Group	Mexican Plant Data (6-Digit)
OTROS: CONEJO, VENADO, IGUANA, ETC.	CONGELACION Y EMPACADO DE CARNE FRESCA
OTROS: ESMALTES Y LIMAS PARA UÑAS, PASADORES, ETC.	FABRICACION DE PRODUCTOS FARMACEUTICOS
OTROS: HIELO, GRANADINA, ETC.	ELABORACION DE GELATINAS, FLANES Y POSTRES EN POLVO PARA PREPARAR EN EL HOGAR
OTROS: PASTEL DE POLLO, SALAMI, MORTADELA, ETC.	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
OTROS: REMOLQUE, LANCHA, ETC.	FABRICACION DE OTRAS PARTES Y ACCESORIOS PARA AUTOMOVILES Y CAMIONES
OTROS: SOPA, GUISADOS, ENSALADAS, PIZZAS, TORTAS, ETC.	ELABORACION DE SOPAS Y GUISOS PREPARADOS
OTROS: SOPAS Y VERDURAS ENVASADAS, ACEITUNAS, ETC.&PURÉ DE TOMATE	ELABORACION DE SOPAS Y GUISOS PREPARADOS
OTROS: YOGHURT, JOCOQUE, ETC.	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
PAN DE CAJA	PANADERIA Y PASTELERIA INDUSTRIAL
PAÑALES	FABRICACION DE ALGODON ABSORBENTE, VENDAS Y SIMILARES
PAÑALES DE TELA	FABRICACION DE TELAS NO TEJIDAS
PANTALONES	CONFECCION DE ROPA EXTERIOR PARA NIÑOS Y NIÑAS
PANTALONES PARA HOMBRE	CONFECCION DE ROPA EXTERIOR PARA CABALLERO HECHA EN SERIE
PANTALONES PARA MUJER	CONFECCION DE ROPA EXTERIOR PARA DAMA HECHA EN SERIE
PAÑUELOS DESECHABLES	FABRICACION DE PAPEL
PAPEL HIGIÉNICO	FABRICACION DE PAPEL
PASTA DENTAL	FABRICACION DE PRODUCTOS FARMACEUTICOS
PASTA PARA SOPA	ELABORACION DE GALLETAS Y PASTAS ALIMENTICIAS
PERIÓDICOS	EDICION DE PERIODICOS Y REVISTAS
PIJAMAS, BATAS Y CAMISONES	FABRICACION DE ROPA INTERIOR DE PUNTO
PILAS	FABRICACION DE ACUMULADORES Y PILAS ELECTRICAS
PIMIENTA	ELABORACION DE SOPAS Y GUISOS PREPARADOS
PINTURAS, BARNICES, CERA Y LIMPIA MUEBLES	FABRICACION DE PINTURAS, BARNICES, LACAS Y SIMILARES
PLACAS Y PUENTES DENTALES	FABRICACION DE PRODUCTOS FARMACEUTICOS
PLANCHAS ELÉCTRICAS	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
PLATOS Y VASOS DESECHABLES, PAPEL ALUMINIO Y ENCERADO	FABRICACION DE PAPEL
POLLO EN PIEZAS	MATANZA DE GANADO Y AVES
POLLO ENTERO	MATANZA DE GANADO Y AVES
PRODUCTOS PARA EL CABELLO	FABRICACION DE PERFUMES, COSMETICOS Y SIMILARES
PROYECTORES	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
PULPA (TROZO Y MOLIDA)	CONGELACION Y EMPACADO DE CARNE FRESCA
PULPA DE CERDO	CONGELACION Y EMPACADO DE CARNE FRESCA
PUROS	BENEFICIO DE TABACO
QUESO AMARILLO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
QUESO CHIHUAHUA O MANCHEGO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
QUESO FRESCO	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
RADIOS Y GRABADORAS	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
RECAMARAS	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
REFRESCOS ENVASADOS	ELABORACION DE REFRESCOS Y OTRAS BEBIDAS NO ALCOHOLICAS
REFRIGERADORES	FABRICACION Y ENSAMBLE DE REFRIGERADORES DE USO DOMESTICO
RETAZO	CONGELACION Y EMPACADO DE CARNE FRESCA
REVISTAS	EDICION DE PERIODICOS Y REVISTAS
ROBALO Y MERO	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
RON	ELABORACION DE BEBIDAS DESTILADAS DE CAÑA
ROPA INTERIOR PARA MUJER	FABRICACION DE ROPA INTERIOR DE PUNTO
SABANAS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
SAL	ELABORACION DE SOPAS Y GUISOS PREPARADOS
SALAS	FABRICACION Y REPARACION DE MUEBLES PRINCIPALMENTE DE MADERA
SALCHICHAS	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
SALSAS	ELABORACION DE SOPAS Y GUISOS PREPARADOS
SARDINA EN LATA	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
SECOS: BACALAO, CHARAL, CAMARÓN, ETC.	PREPARACION Y ENVASADO DE CONSERVAS DE PESCADOS Y MARISCOS
SEMILLAS ENVASADAS (NUEZ, PIÑÓN, ALMENDRA, CACAHUATE, ETC.)	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
SERVILLETAS DE PAPEL	FABRICACION DE PAPEL
SOMBREROS	CONFECCION DE ROPA EXTERIOR PARA CABALLERO HECHA EN SERIE
SUÉTERES Y CHAMBRITAS	FABRICACION DE SUETERES
SUÉTERES, ABRIGOS, CHAMARRAS Y CHAQUETAS	FABRICACION DE SUETERES
TABACO (EN HOJA Y PICADO)	BENEFICIO DE TABACO
TAPETES Y ARTEFACTOS DE HULE	HILADO Y TEJIDO DE HENEQUEN
TÉ SOLUBLE O INSTANTÁNEO	ELABORACION DE CAFE SOLUBLE
TELEVISORES Y VIDEOCASETERAS	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
TEQUILA	ELABORACION DE BEBIDAS DESTILADAS DE AGAVES
TOALLAS	CONFECCION DE SABANAS, MANTELES, COLCHAS Y SIMILARES
TOALLAS SANITARIAS	FABRICACION DE PAPEL
TOCINO	PREPARACION DE CONSERVAS Y EMBUTIDOS DE CARNE
TRAJE PARA BEBÉ	FABRICACION DE ROPA INTERIOR DE PUNTO
TRAJES	CONFECCION DE ROPA EXTERIOR PARA CABALLERO HECHA EN SERIE
UNIFORMES ESCOLARES	FABRICACION DE SUETERES
UTENSILIOS DE PLÁSTICO PARA EL HOGAR	FABRICACION DE ARTICULOS DE PLASTICO PARA EL HOGAR
VELAS Y VELADORAS	OTRAS INDUSTRIAS
VENTILADOR	FABRICACION Y ENSAMBLE DE ENSERES DOMESTICOS MENORES
VERDURAS MIXTAS EN BOLSA	PREPARACION Y ENVASADO DE FRUTAS Y LEGUMBRES
VESTIDO PARA NIÑA	CONFECCION DE ROPA EXTERIOR PARA NIÑOS Y NIÑAS
VESTIDOS Y CONJUNTOS	CONFECCION DE ROPA EXTERIOR PARA DAMA HECHA EN SERIE
VIDEOCASSETERA	FABRICACION Y ENSAMBLE DE RADIOS, TELEVISORES Y REPRODUCTORES DE SONIDO
VINAGRE	ELABORACION DE SOPAS Y GUISOS PREPARADOS
VINO DE MESA	VINIFICACION (ELABORACION DE BEBIDAS FERMENTADAS DE UVA)
VISERAS: (CORAZÓN, HÍGADO, ETC.)	CONGELACION Y EMPACADO DE CARNE FRESCA
YOGHURT	ELABORACION DE CREMA, MANTEQUILLA Y QUESO
ZAPATOS DE PIEL Y PLÁSTICO	FABRICACION DE CALZADO PRINCIPALMENTE DE CUERO
ZAPATOS PARA BEBÉ	FABRICACION DE CALZADO PRINCIPALMENTE DE CUERO