Trading with Richer Partners: Trade Integration and Structural Change in Mexico*†

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Abstract

Does the development level of trading partners shape how trade integration drives structural change in a developing economy? Trade integration affects structural change through comparative advantage, foreign demand, and production costs, all of which depend on the characteristics of the trading partner. Using a multi-country, three-sector Ricardian general equilibrium model calibrated to Mexico, Canada, the United States, and the rest of the world over 1971-2018, this paper isolates the role of partner development by comparing Mexico's integration with North America against an integration with similar-income peers. By 2018, Mexico's observed trade-cost path raises its manufacturing value-added share by 12.11 percentage points relative to no integration. With partners at Mexico's development level, this effect falls to 2.83 points, while the effect on agriculture changes sign. The United States drives most of this difference. Thus, trade integration's effects on structural change depend critically on the development characteristics of the economies it connects.

KEYWORDS: Structural Change; International Trade; Trade Integration; Economic Development; Trade Liberalization.
JEL CODES: F14; F15; O14; O19; O24.

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1 Introduction

Structural change is defined as the reallocation of economic activity across the three broad sectors of the economy, agriculture, manufacturing, and services, that accompanies the process of modern economic growth (Kuznets 1973, Herrendorf et al. 2014). As economies develop, the contribution of agriculture, in terms of employment or value-added, shrinks, that of manufacturing first grows and then shrinks, and that of services grows. This empirical regularity has been documented across a wide range of countries and has motivated a large literature seeking to identify the mechanisms that govern the pace and direction of structural change. While income effects and sector-specific productivity growth are now well-understood drivers of structural change, much less is known about the role of trade integration, particularly when this integration occurs between countries at different stages of development.

This question is especially relevant in the contemporary global economy. Over the past four decades, the world has experienced an unprecedented expansion of trade integration through regional and multilateral trade agreements. The WTO reports 388 notified regional trade agreements in force as of September 2026,[1] many of which link developing economies to substantially more advanced partners. Yet, despite the prominence of these agreements, their implications for the sectoral reallocation of economic activities in developing countries remain theoretically ambiguous and empirically underexplored. Trade liberalization can accelerate industrialization by expanding market access and lowering input costs, but it can also reinforce comparative advantage in primary sectors or limit industrialization, depending on partner characteristics and the structure of demand.

This paper studies how the level of development of trading partners shape the effects of trade integration on structural change in the home country, using Mexico's growing participation in the global economy as a quantitative laboratory. The Mexican experience provides a particularly informative setting for examining this relationship. Since the 1970s, the Mexican economy has undergone a pronounced process of structural change while simultaneously transitioning from a relatively closed economy to one deeply integrated with global markets. Two major trade liberalization policy milestones punctuate this period: Mexico's accession to the General Agreement on Tariffs and Trade (GATT) in 1986 and the implementation of the North American Free Trade Agreement (NAFTA) in 1994. Importantly, NAFTA linked Mexico to the United States and Canada, two economies at a far more advanced stage of development, and today roughly two-thirds of Mexico's trade is conducted with the U.S. This combination of deep integration and stark cross-country income asymmetry makes Mexico an ideal setting to examine how trade integration and the development level of trading partners jointly affect structural change.

The motivating facts presented in Section 2 sharpen this interpretation of the Mexican case. Mexico's post-1970s trade expansion was not a neutral increase in openness spread evenly across foreign partners. It was concentrated in North America, especially in exports to the United States, and therefore exposed Mexico to foreign demand, input prices, and productivity levels associated with substantially more developed economies.

This pattern motivates the paper's central distinction between trade integration and partner development. If structural change depends on the sectoral composition of foreign demand, the cost of imported intermediate inputs, and comparative advantage shaped by trading partners' productivity, then the development characteristics of those partners are integral to the effects of trade integration on structural change. The Mexican experience therefore raises three closely related questions. First, what role does trade integration, particularly with advanced economies, play in shaping Mexico's structural change? Second, what is the quantitative contribution of Mexico's global trade integration and two major trade liberalization episodes, GATT

[1] World Trade Organization, "Regional Trade Agreements Database," RTA Tracker and summary tables, accessed August 2026: `https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx`.

accession and NAFTA, to the reallocation of economic activity across agriculture, manufacturing, and services? Third, how would these effects on structural change have differed if Mexico had integrated with trading partners at a similar level of development rather than with the more advanced United States and Canada? By jointly addressing these questions, the paper disentangles the role of trade integration from that of differences in development levels across trading partners and quantifies how partner development shapes the effects of trade integration on structural change.

To address these questions, I develop and quantify a four-country,[2] three-sector general equilibrium model of structural change. The model features agriculture, manufacturing, and services, and incorporates non-homothetic preferences, such that the income elasticities of demand for sectoral goods differ from one (e.g., Kongsamut et al. 2001, Herrendorf et al. 2013, Uy et al. 2013). Sector-specific productivity growth generates endogenous changes in relative prices, thereby inducing structural reallocation (e.g., Baumol 1967; Ngai & Pissarides 2007). The model further introduces international trade in intermediate inputs, which affects the sectoral composition of production and employment. Varieties in all three sectors can be sourced internationally, while final sectoral composite goods are assembled domestically from those traded varieties. The patterns of specialization and international trade are determined by relative productivity differences across countries, as in Uy et al. (2013), Sposi (2019) and Sposi et al. (2026).

In the model, trade integration influences structural change through three distinct but interrelated channels. First, a simultaneous reduction in trade costs between Mexico and its trading partner alters relative production costs and intensifies specialization patterns across sectors. Lower trade costs on intermediate inputs change the composition of sectoral production in both countries by reallocating resources toward sectors in which each country has a comparative advantage under the new trade regime. This reorganization of production directly affects sectoral labor and value-added shares, as resources are reallocated to meet the modified structure of domestic and foreign demand. Through this channel, trade integration reshapes the sectoral composition of the economy by expanding some sectors while contracting others.

Second, trade integration affects income, which further amplifies these reallocations through income effects. Reductions in trade costs raise real income in both countries, but the resulting increase in demand for sectoral goods is heterogeneous due to non-homothetic preferences. As income rises, demand shifts away from goods with low income elasticities toward those with higher income elasticities, inducing additional changes in sectoral production and factor allocation. Third, trade cost reductions affect the relative prices of final goods by altering the cost of intermediate inputs used in their production. Changes in relative prices of final goods, in turn, modify sectoral expenditure shares and trigger further reallocation of labor and resources across sectors. Together, these three channels—specialization, income effects, and relative price changes—govern the impact of trade integration on structural change.

The magnitude and direction of these effects depend on the development level and size of the trading partner. When integration occurs with an advanced economy such as the United States, where agriculture accounts for less than four percent of employment and services exceed sixty-five percent, the composition of foreign demand faced by Mexico is tilted toward manufacturing and services. This demand structure strengthens the reallocation of resources away from agriculture and toward sectors with higher income elasticities. At the same time, differences in sectoral productivity between Mexico and the United States shape their comparative advantage and, consequently, Mexico's pattern of specialization. In particular, a large productivity gap in agriculture relative to manufacturing can gives Mexico a weaker comparative advantage in agriculture and a stronger comparative advantage in manufacturing, reinforcing specialization away from agriculture and toward manufacturing as trade costs fall. The large income gap between Mexico and the United States further strengthens differences in expenditure patterns and

[2]The countries in the model are Mexico, Canada, the United States, and the rest of the world.

foreign demand. As a result, trade integration with advanced partners can generate markedly different patterns of structural change from otherwise comparable integration with countries at similar stages of development, even when trade costs fall by the same amount.

I calibrate the model to match key features of the Mexican, Canadian, and U.S. economies over the period 1971–2018, using data on sectoral employment, expenditure shares, trade flows, prices, and productivity growth. I then conduct a series of counterfactual experiments designed to isolate the roles of three forces: the observed evolution of trade costs, the development level of Mexico's trading partners, and partner market size. To vary partner development, I reassign initial sectoral productivity levels, sectoral wage paths, and preference weights while holding trade costs, partner size, input–output structure, trade imbalances, and geography fixed. Importantly, the productivity reassignment preserves each target country's own sectoral productivity-growth path, ensuring that the Baumol mechanism is not mechanically transferred across countries. To quantify the effects of trade integration and specific liberalization episodes, I construct counterfactuals that hold trade costs fixed at their initial, pre-GATT, or pre-NAFTA levels. Finally, to isolate the role of partner market size, I assign the United States and Canada Mexico's observed labor-endowment path while leaving their development characteristics unchanged.

The main quantitative finding is that partner development shapes both the magnitude and the sectoral direction of the effects of trade integration. Trading with advanced partners shifts Mexico away from agriculture and toward manufacturing relative to an otherwise comparable environment with Mexico development level partners, with the U.S. relationship accounting for most of this effect. By 2018, trade integration increases Mexico's manufacturing value-added share by 12.11 percentage points and reduces the services share by 12.01 points relative to the no-integration counterfactual. With Mexico-level partners, the same trade-cost path increases manufacturing by only 2.83 points and reduces services by 5.40 points, while the effect on agriculture changes sign. Thus, the development level of Mexico's trading partners substantially alters how trade integration translates into structural change.

The GATT and NAFTA experiments further show that identical trade-cost reductions need not generate the same pattern of sectoral reallocation, as their effects depend on the development characteristics and market size of the economies involved. In particular, the positive effect of NAFTA on Mexico's manufacturing employment and value-added shares would have been approximately half as large had Mexico entered the agreement with trading partners at a similar level of development. The market size counterfactual experiment shows that partner market size also affects both the magnitude and, in some cases, the sectoral composition of trade-induced structural change. These results show that the effects of trade integration on structural change depend not only on the associated trade-cost reductions, but also on the development characteristics of the connected economies.

Taking together, these findings imply that the level of development of trading partner is not merely a scale factor in trade-induced structural change, but an integral part of the transmission mechanism. Differences in partner productivity, wages, and expenditure patterns shape the foreign demand and relative-price responses generated by trade integration and, consequently, the resulting sectoral reallocation.

Related Literature. This paper is related to the literature examining the effects of trade agreements, particularly NAFTA, on the Mexican economy. Park (2001) finds that NAFTA increased bilateral trade between Mexico and the United States in vehicles, machinery, and iron and steel products. McDaniel & Agama (2003) shows that U.S. import demand for Mexican goods responded strongly to reductions in U.S. tariffs on Mexican products between 1989 and 2001, with larger responses in the post-NAFTA period. By contrast, Konno & Fukushige (2003) finds no additional long-run effect of NAFTA on bilateral trade between Mexico and the United States. Using a multi-sector Ricardian model, Caliendo & Parro (2015) quantifies the general-equilibrium effects of NAFTA and finds positive effects on trade and welfare in both Mexico and the United States. Relative to this literature, I focus on the consequences for structural change and consider Mexico's broader process of global trade integration together with two major liberalization episodes, GATT accession and NAFTA. More importantly, I distinguish the effects of trade integration from the role played by differences in development levels across trading partners, showing how partner development shapes the sectoral reallocation generated by trade integration.

My paper is also related to the growing literature on the role of openness and international trade in structural change. This literature includes Matsuyama (2009), Uy et al. (2013), Swiecki (2017), Betts et al. (2017), Sposi (2019), Teignier (2018), Cravino & Sotelo (2019), and Matsuyama (2019). The two closest papers are Sposi et al. (2026) and De Vries et al. (2026). Sposi et al. (2026) study premature deindustrialization and industrial polarization in a dynamic multi-country model and show that trade operates primarily through its interaction with sector-biased technological change. In their framework, trade transmits foreign technological change across countries, alters relative prices in manufacturing, and generates sectoral trade imbalances. De Vries et al. (2026) apply a related open-economy framework to sub-Saharan Africa and developing Asia. They find that domestic and foreign sectoral TFP are the main determinants of manufacturing value-added shares, while changes in trade costs over time play a smaller quantitative role. Trade nevertheless remains important because it transmits foreign productivity changes to domestic sectoral allocations.

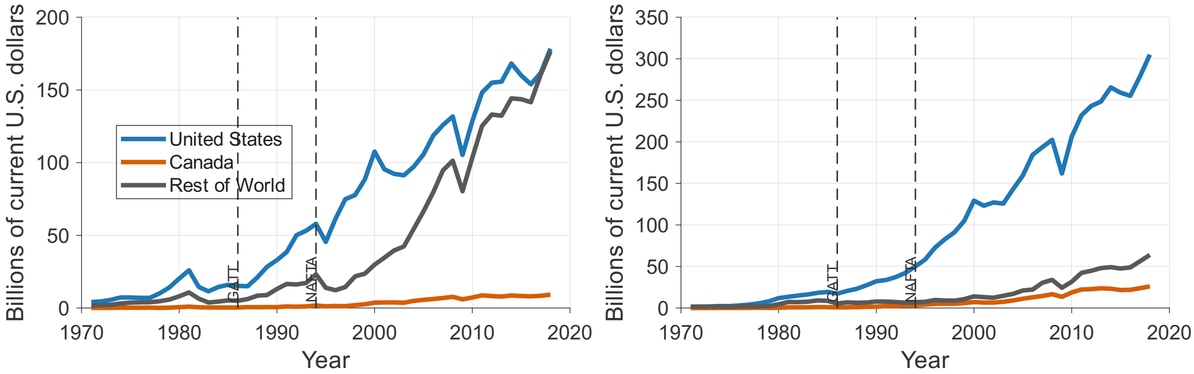
This paper complements this literature by emphasizing a distinct dimension of the international transmission mechanism: the development characteristics of trading partners. While existing work highlights the transmission of foreign productivity changes through trade, I show that the sectoral effects of trade integration also depend on the development gap between the economies being integrated. Consequently, the same trade liberalization can generate different patterns of sectoral reallocation depending on the development characteristics of the trading partners.

The remainder of the paper proceeds as follows. Section 2 documents the motivating trade facts. Section 3 introduces the model and provides theoretical insights into the mechanisms linking trade integration and structural change. Section 4 describes the data, calibration strategy, and model fit. Section 5 presents the counterfactual results. Section 7 concludes.

2 Motivating Facts: Mexico's Trade Concentration

Two facts about Mexico's external trade motivate the quantitative emphasis on partner development. First, Mexico's integration was not only an increase in overall openness; it was also a reorientation toward a specific set of advanced partners. Figure 1 plots Mexico's total imports and exports with the United States, Canada, and the rest of the world, with vertical lines marking GATT accession in 1986 and NAFTA in 1994. Trade with the United States expands sharply over the sample, especially on the export side. Mexican exports to the United States rise from 1.26 billion current U.S. dollars in 1971 to 17.35 billion in 1986, 50.11 billion in 1994, and 305.01 billion in 2018. Imports from the United States also expand substantially, although by 2018 imports from the rest of the world are nearly as large as imports from the United States.

Second, the composition of Mexico's trading partners is highly asymmetric. Figure 2 shows that the United States accounted for 42.5 percent of Mexico's exports in 1971, 73.7 percent in 1986, 82.6 percent in 1994, and 77.2 percent in 2018. Canada remained a smaller trading partner, although its export share increased from 1.7 percent in 1971 to 6.6 percent in 2018. On the import side, the United States remained dominant throughout the NAFTA period, while by 2018 the United States and the rest of the world each accounted for roughly one-half of Mexico's external imports. These patterns are central to the question studied in this paper. If Mexico's structural change depends on foreign demand, the cost of imported inputs, and the productivity

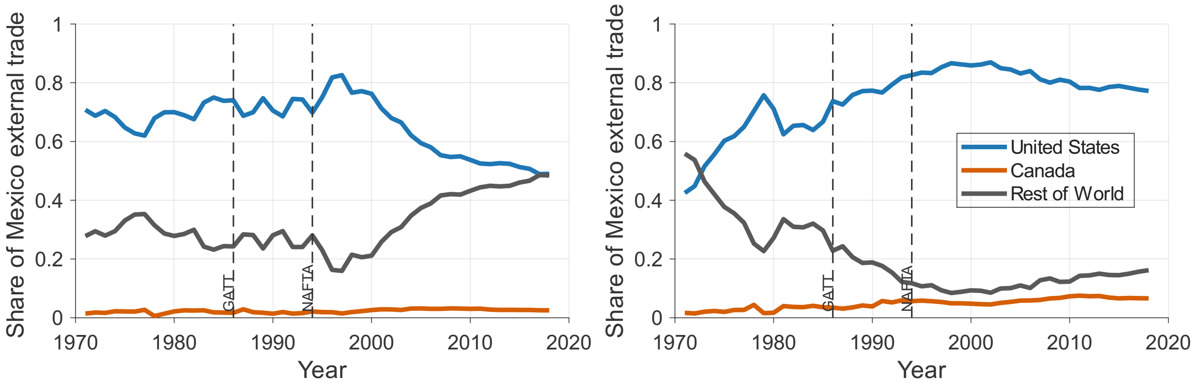


(a) Import

(b) Export

Figure 1: Mexico's Bilateral Trade with Main Partners

Notes: The figure reports Mexico's total imports from, and exports to, the United States, Canada, and the rest of the world. Values are in billions of current U.S. dollars. Vertical lines mark Mexico's GATT accession in 1986 and NAFTA in 1994.



(a) Import shares

(b) Export shares

Figure 2: Partner Shares in Mexico's External Trade

Notes: The figure reports the shares of the United States, Canada, and the rest of the world in Mexico's external imports and exports. Domestic absorption is excluded from the denominator. Vertical lines mark Mexico's GATT accession in 1986 and NAFTA in 1994.

of its trading partners, then the substantial development gap between Mexico and its two main North American partners may be an important determinant of how trade integration affects sectoral reallocation. This paper therefore asks how Mexico's structural change would have differed had it integrated with trading partners at a similar level of development rather than with the more advanced United States and Canada.

3 Model

Along the lines of Sposi et al. (2026), De Vries et al. (2026) and Avoumatsodo & Leunga Noukwe (2025), I develop a three-sector, multi-country Ricardian general equilibrium model to investigate the role of trading-partner development in domestic structural change. The model features four countries and three sectors: agriculture (a), manufacturing (m), and services (s). Each country is populated by a representative household with nonhomothetic preferences and firms operating under constant returns to scale. The model integrates non-unitary income and substitution elasticities of demand alongside sector-specific productivity growth. This formulation allows both the Engel effect and the Baumol effect to operate simultaneously within the economy. Each sector produces a continuum of varieties using labor and intermediate inputs. In the benchmark specification, all varieties are tradable across countries, and international trade is subject to iceberg trade costs. Time-varying trade costs interact with income-driven demand shifts (Income effect) and productivity-driven relative price changes (Baumol effect) to generate structural change. These three mechanisms jointly serve as the primary channels through which the model accounts for the reallocation of economic activity across sectors. Trade is assumed to be imbalanced in each period. To maintain simplicity, the time subscript is omitted unless explicitly required.

3.1 Technologies

In each sector $k \in \{a, m, s\}$, there exists a continuum of varieties indexed by $z \in [0, 1]$. Every country possesses the technological capacity to produce all varieties across all sectors. Production of each variety z in sector k of country i is carried out by competitive firms using the following constant returns to scale technology:

$$Y_{ik}(z) = a_{ik}(z) L_{ik}(z)^{1-\lambda_{ik}} \left[\prod_{n \in \{a,m,s\}} M_{ikn}^{\gamma_{ikn}}(z) \right]^{\lambda_{ik}}, \tag{1}$$

where $Y_{ik}(z)$ denotes output, $L_{ik}(z)$ is labor input, and $M_{ikn}(z)$ is the quantity of composite good from sector n used as an intermediate input in the production of the sector k good. The parameter $\lambda_{ik} \in (0, 1)$ is the intermediate-input share in gross output, so $1 - \lambda_{ik}$ is the value-added share. The coefficients $\gamma_{ikn} \in (0, 1)$ denote the composition of intermediate inputs and satisfy $\sum_n \gamma_{ikn} = 1$.

The term $a_{ik}(z)$ is the idiosyncratic productivity for producing variety z in sector k in country i. Following Eaton & Kortum (2002), productivity draws are Frechet with cumulative distribution function $F_{ik}(a) = \exp[-T_{ik} a^{-\theta}]$, where T_{ik} is the country-sector technology scale and θ is the trade elasticity.

Goods markets are perfectly competitive, and prices equal marginal costs. Given input prices, the unit cost v_{ik} for a bundle of inputs for producers in sector k in country i is:

$$v_{ik} = \Upsilon_{ik} w_{ik}^{1-\lambda_{ik}} \left[\prod_{n \in \{a,m,s\}} P_{in}^{\gamma_{ikn}} \right]^{\lambda_{ik}}, \tag{2}$$

where w_{ik} is the wage in sector k in country i, and P_{in} is the price of the sector-n composite good while Υ_{ik} is a constant defined as:

$$\Upsilon_{ik} = (1 - \lambda_{ik})^{\lambda_{ik}-1} \left[\lambda_{ik} \gamma_{ika}^{-\gamma_{ika}} \gamma_{ikm}^{-\gamma_{ikm}} \gamma_{iks}^{-\gamma_{iks}} \right]^{-\lambda_{ik}}.$$

The wage is sector-specific in line with Buera & Kaboski (2009), which argued that wage differentials are necessary to account for differences in sectoral employment shares and value added shares in the data.[3] The share of employment in agriculture is three times higher than the share of value added in the same sector, and wage differentials are significant in order to incorporate this fact into the model. I capture wage differentials using sectoral wage wedges relative to manufacturing wages:

$$\xi_{ia} \equiv \frac{w_{ia}}{w_{im}}, \quad \xi_{is} \equiv \frac{w_{is}}{w_{im}} \tag{3}$$

By construction, the wedge in manufacturing is then equal to one, $\xi_{im} \equiv 1$.

[3] Swiecki (2017) argue that wage differentials across sectors can arise with homogeneous labor for a number of reasons; such wedges can capture the effects of distortions in domestic labor markets that cause effective labor costs to diverge across sectors.

To aggregate variety-level production and inputs to the sectoral level, I integrate across all varieties:

$$L_{ik} = \int_0^1 L_{ik}(z)\,dz, \quad M_{ikn} = \int_0^1 M_{ikn}(z)\,dz, \quad Y_{ik} = \int_0^1 Y_{ik}(z)\,dz. \tag{4}$$

Here, L_{ik} denotes total labor used in sector k, M_{ikn} is the total quantity of inputs from sector n used in sector k, and Y_{ik} is the total output of sector k.

3.2 Composite Goods

In each sector $k \in \{a, m, s\}$, a sectoral composite good Q_{ik} is assembled from a continuum of differentiated varieties indexed by $z \in [0, 1]$. The aggregation follows a constant elasticity of substitution function:

$$Q_{ik} = \left(\int_0^1 Q_{ik}(z)^{(\eta-1)/\eta} dz \right)^{\eta/(\eta-1)}, \tag{5}$$

where $\eta > 1$ denotes the constant elasticity of substitution between varieties. This elasticity is assumed to be invariant across countries, sectors, and over time. The term $Q_{ik}(z)$ represents the quantity of variety z demanded in country i's sector k, which is sourced from the lowest-cost supplier globally. In all three sectors, each variety z may be either domestically produced or imported from another country, depending on relative delivered costs. The CES aggregation problem faced by the representative composite-good producer yields the following demand function for variety z:

$$Q_{ik}(z) = \left(\frac{p_{ik}(z)}{P_{ik}} \right)^{-\eta} Q_{ik}, \tag{6}$$

+ where $p_{ik}(z)$ denotes the minimum price of variety good z across all locations i, and P_{ik} represents the ideal CES price index for the composite good in sector k:

$$P_{ik} = \left[\int_0^1 p_{ik}(z)^{1-\eta}\,dz \right]^{1/(1-\eta)}. \tag{7}$$

The sectoral composite good Q_{ik} serves two functions in the economy: it is used as a final consumption good and as an intermediate input in the production of all sectoral varieties. The equilibrium condition for the market of composite goods equates total demand with the sum of final and intermediate demands:

$$Q_{ik} = C_{ik} + \sum_{n \in \{a,m,s\}} M_{ink}, \tag{8}$$

where C_{ik} is the final consumption of the sector-k composite good in country i, and M_{ink} denotes the total quantity of sector-k composite good used as intermediate input in the production of varieties in sector n. Equation (8) captures the core market-clearing condition for composite goods. It highlights the dual role of composite goods in supporting both final demand and intermediate production across sectors.

3.3 Trade Costs and Prices

International trade in the model occurs across all three sectors and is subject to trade costs that include tariffs, transportation expenses, and other cross-border frictions. I represent these costs using an iceberg formulation: to deliver one unit of a good z in sector k from country j to country i, a firm must ship $\tau_{ijk} \geq 1$ units. Consequently, only $1/\tau_{ijk}$ units arrive at the destination. For simplicity, I assume that there are no trade costs within a country, i.e., $\tau_{iik} = 1$, which implies that goods can move freely across regions within the same national border.

The price at which country j can supply a variety z in sector k to country i is:

$$p_{ijk}(z) = \tau_{ijk} \frac{v_{jk}}{a_{jk}(z)}.$$

Given perfect competition and cost minimization, country i sources each variety from the supplier offering the lowest delivered price. Thus, the price of variety z in sector k in country i is determined as:

$$p_{ik}(z) = \min_{j} \left\{ \frac{\tau_{ijk} v_{jk}}{a_{jk}(z)} \right\}. \tag{9}$$

Under the Frechet productivity distribution, Eaton & Kortum (2002) show that the sectoral composite price index for all sectors $k \in \{a, m, s\}$ in country i is given by:

$$P_{ik} = \gamma \left[\sum_{j=1}^{4} T_{jk} \left(v_{jk} \tau_{ijk} \right)^{-\theta} \right]^{-\frac{1}{\theta}}, \tag{10}$$

where $\theta > 1$ is the shape parameter of the Frechet distribution and γ is a constant defined as:

$$\gamma := \left[\Gamma \left(1 + \frac{1-\eta}{\theta} \right) \right]^{1/(1-\eta)}.$$

Finally, the share of expenditure that country j allocates to imports of sector-k goods from country i, denoted π_{jik}, corresponds to the probability that country j sources a variety from country i. It is given by:

$$\pi_{jik} = \frac{T_{ik} \left(v_{ik} \tau_{jik} \right)^{-\theta}}{\sum_{\ell=1}^{4} T_{\ell k} \left(v_{\ell k} \tau_{j \ell k} \right)^{-\theta}}. \tag{11}$$

This gravity-like expression illustrates that a country's export share rises with higher technological capability T_{ik}, lower unit cost of input bundles v_{ik}, and reduced bilateral trade costs τ_{jik}. These factors jointly increase the likelihood that a country becomes the lowest-cost supplier for a given variety in sector k, thereby influencing patterns of trade and specialization across all sectors.

3.4 Households

Each period, the representative household in country i derives instantaneous utility from aggregate consumption C_i according to a logarithmic utility function: $U(C_i) = \log C_i$, where C_i is a composite index of sectoral consumption in agriculture, manufacturing, and services. I use the nonhomothetic CES aggregator developed by Comin et al. (2021) and used in related work on structural change and trade, which is implicitly defined by:

$$\sum_{k \in \{a,m,s\}} \omega_{ik} \left(\frac{C_i}{L_i} \right)^{\frac{1-\sigma}{\sigma} \varepsilon_k} \left(\frac{C_{ik}}{L_i} \right)^{\frac{\sigma-1}{\sigma}} = 1, \tag{12}$$

where parameters $\omega_{ik} \in (0, 1)$ are the relative weights of sectoral goods within the bundle. The parameter $\sigma > 0$ governs the elasticity of substitution across sectoral goods, and $\varepsilon_k > 0$ governs the scale elasticity of sector-k consumption and the shape of the Engel curve.

Following Caliendo et al. (2018) and Sposi et al. (2026), I abstract from international borrowing and lending by modeling trade imbalances as international transfers. Specifically, an exogenous fraction $\phi_i \in [0, 1]$ of country i's income is contributed to a global portfolio. This global pool is then redistributed uniformly across countries in the form of a per-capita lump-sum transfer T, ensuring that world trade remains balanced in each period.

Under this formulation, net exports NX_i in country i are given by:

$$NX_i = \phi_i \sum_{k\in\{a,m,s\}} w_{ik} L_{ik} - L_i T,$$

Accordingly, the representative household in country i faces the following period budget constraint:

$$\sum_{k\in\{a,m,s\}} P_{ik} C_{ik} = (1-\phi_i) \sum_{k\in\{a,m,s\}} w_{ik} L_{ik} + L_i T. \tag{13}$$

The right-hand side captures the share of domestic labor income retained after contributions to the global portfolio, plus the country's share of redistributed global transfers. This setup allows for persistent trade imbalances across countries while maintaining global financial feasibility.

The household's intra-temporal problem is equivalent to minimizing total expenditure required to achieve a given level of utility C_i, subject to the nonhomothetic CES aggregator:

$$\min_{\{C_{ia}, C_{im}, C_{is}\}} \quad \sum_{k\in\{a,m,s\}} P_{ik} C_{ik} \tag{14}$$
$$\text{s.t.} \quad \sum_{k\in\{a,m,s\}} \omega_{ik} \left(\frac{C_i}{L_i}\right)^{\frac{1-\sigma}{\sigma}\varepsilon_k} \left(\frac{C_{ik}}{L_i}\right)^{\frac{\sigma-1}{\sigma}} = 1.$$

This dual formulation is analytically useful, as the first-order conditions yield closed-form expressions for sectoral demand.

Solving the minimization problem yields the following demand function for sector-k consumption:

$$\frac{C_{ik}}{L_i} = \omega_{ik}^{\sigma} \left(\frac{P_{ik}}{E_i}\right)^{-\sigma} \left(\frac{C_i}{L_i}\right)^{\varepsilon_k(1-\sigma)} \tag{15}$$

where $E_i := \sum_{k=a,m,s} P_{ik} C_{ik}$ is total expenditure on consumption in the countri i.

Equation (15) can be rearranged to express demand as a function of the implicit aggregate price index P_i:

$$\frac{C_{ik}}{L_i} = \omega_{ik}^{\sigma} \left(\frac{P_{ik}}{P_i}\right)^{-\sigma} \left(\frac{C_i}{L_i}\right)^{\varepsilon_k(1-\sigma)+\sigma}, \tag{16}$$

where the consumption-based price index P_i is given by:

$$P_i = \left[\sum_{k\in\{a,m,s\}} \omega_{ik}^{\sigma} P_{ik}^{1-\sigma} \left(\frac{C_i}{L_i}\right)^{(1-\sigma)(\varepsilon_k-1)}\right]^{\frac{1}{1-\sigma}}. \tag{17}$$

This implicit price index captures how the structure of preferences and the degree of nonhomotheticity affect the weighting of sectoral prices in aggregate consumption. Importantly, it evolves with income C_i, reflecting how households reallocate expenditure as income grows.

3.5 Equilibrium

The model economy is characterized by a set of time-invariant parameters $(\varepsilon_k, \sigma, \theta, \eta, \lambda_{ik}, \gamma_{ijk}, \omega_{ik})$ and a collection of time-varying exogenous processes, including sectoral technology scales, bilateral trade costs and sectoral wage wedges $\{T_{ik}, \tau_{ijk}, \xi_{ik}\}$, labor endowments $\{L_i\}$, and trade imbalance parameters $\{\phi_i\}$. I first define and then characterize the competitive equilibrium of the model.

Definition. A competitive equilibrium in this framework is a sequence of sectoral goods, factor prices and aggregate price $\{P_{ia}, P_{im}, P_{is}, w_{ia}, w_{im}, w_{is}, P_i\}_{i \in \mathbb{I}}$, where $\mathbb{I} = \{1, 2, 3, 4\}$, allocations $\{L_{ia}, L_{im}, \ L_{is}, Q_{ia}, Q_{im}, Q_{is}, C_{ia}, C_{im}, C_{is}, C_i, T\}_{i \in \mathbb{I}}$, and sectoral trade shares $\{\pi_{ija}, \pi_{ijm}, \pi_{ijs}\}_{i,j \in \mathbb{I}}$, such that, given prices and the allocations (i) Firms maximize profits, taking prices as given, according to the production technology specified in Equation (1); (ii) Households choose sectoral consumption to maximize utility subject to the budget constraint (13) and preference structure defined by Equations (12); (iii) Each country sources every variety from the lowest-cost supplier, as in Equation (11); and (iv) All factor and goods markets clear.

Market Clearing Conditions. The factor market clearing conditions for labor and sectoral composite goods in each period are as follows:

$$L_i = \sum_{k \in \{a,m,s\}} L_{ik} \tag{18}$$

$$Q_{ik} = C_{ik} + \sum_{n \in \{a,m,s\}} M_{ink}. \tag{19}$$

Using the demand structure of intermediate inputs, Equation (19) can be equivalently expressed as:

$$Q_{ik} = C_{ik} + \sum_{n \in \{a,m,s\}} \gamma_{ink} \lambda_{in} \frac{P_{in} Q_{in}}{P_{ik}}. \tag{20}$$

The global portfolio's total intake from national contributions must equal total disbursements in the form of lump-sum transfers:

$$\sum_{i=1}^{4} \sum_{k \in \{a,m,s\}} \phi_i w_{ik} L_{ik} = \sum_{i=1}^{4} L_i T. \tag{21}$$

Table 1 provides a set of equations that characterize the equilibrium of the economy. This system of conditions jointly determines the endogenous allocation of labor, output, consumption, prices, and trade flows across countries and sectors, given exogenous fundamentals.

3.6 Trade Policy and Structural Change

In this section, I examine the theoretical drivers of structural change, focusing on how trade integration and income disparities between trading partners interact with these forces. To facilitate analytical tractability and yield transparent insights, I adopt a simplified version of the model. Specifically, I assume (i) no intermediate inputs, i.e., $\lambda_{ik} = 0$, so production depends only on labor and idiosyncratic productivity, and (ii) balanced trade in every period, i.e., $\phi_i = 0$, so that income equals total expenditure in each country.

Let $\ell_{ik} := L_{ik}/L_i$ denote the share of labor allocated to sector k in country i, which is also equal to the value-added share in this simplified framework. I aim to derive an explicit expression for ℓ_{ik} under these simplifying assumptions. Starting from the equilibrium condition for labor market clearing ($S4$), the labor share can be expressed as:

$$\ell_{ik} = \frac{L_{ik}}{L_i} = \sum_{j=1}^{4} \frac{P_{jk} Q_{jk} \pi_{jik}}{w_i L_i} = \sum_{j=1}^{4} \frac{P_{jk} Q_{jk}}{w_j L_j} \frac{w_j L_j}{w_i L_i} \pi_{jik} \tag{22}$$

Given $\lambda_{ik} = 0$, this implies that labor is the only input into production and that intermediate input usage is zero. Therefore, Equation (20) implies that total output in sector k of country

Table 1: Equilibrium Conditions

$D1:$	$C_{ik} = L_i \omega_{ik}^{\sigma} \left(\frac{P_{ik}}{P_i}\right)^{-\sigma} \left(\frac{C_i}{L_i}\right)^{(1-\sigma)\varepsilon_k+\sigma}$	$\forall i \in \mathbb{I},\ \forall k \in \{a,m,s\}$
$D2:$	$\sum_{k\in\{a,m,s\}} P_{ik}C_{ik} = (1-\phi_i) \sum_{k\in\{a,m,s\}} w_{ik}L_{ik} + L_i T$	$\forall i \in \mathbb{I}$
$D3$	$P_i^{1-\sigma} = \sum_{k\in\{a,m,s\}} \omega_{ik}^{\sigma} P_{ik}^{1-\sigma} \left(\frac{C_i}{L_i}\right)^{(1-\sigma)(\varepsilon_k-1)}$	$\forall i \in \mathbb{I}$
$S1:$	$P_{ik} = \gamma \left[\sum_{j=1}^{4} T_{jk} \left(v_{jk}\tau_{ijk}\right)^{-\theta}\right]^{-\frac{1}{\theta}}$	$\forall i \in \mathbb{I},\ \forall k \in \{a,m,s\}$
$S2:$	$v_{ik} = \Upsilon_{ik} w_{ik}^{1-\lambda_{ik}} \left[\prod_{n=a,m,s} P_{in}^{\gamma_{ikn}}\right]^{\lambda_{ik}}$	$\forall i \in \mathbb{I},\ \forall k \in \{a,m,s\}$
$S3:$	$\pi_{ijk} = \frac{T_{jk}\left(v_{jk}\tau_{ijk}\right)^{-\theta}}{\sum_{l=1}^{4} T_{lk}\left(v_{lk}\tau_{ilk}\right)^{-\theta}}$	$\forall i,j \in \mathbb{I},\ \ \forall k \in \{a,m,s\}$
$S4$:	$L_{ik}w_{ik} = (1-\lambda_{ik}) \sum_{j=1}^{4} P_{jk}Q_{jk}\pi_{jik}$	$\forall i \in \mathbb{I},\ \forall k \in \{a,m,s\}$
$S5$:	$w_{ik} = \xi_{ik} w_{im}$	$\forall i \in \mathbb{I},\ \forall k \in \{a,m,s\}$
$M1:$	$L_i = \sum_{k\in\{a,m,s\}} L_{ik}$	$\forall i \in \mathbb{I}$
$M2:$	$Q_{ik} = C_{ik} + \sum_{n\in\{a,m,s\}} \gamma_{ink}\lambda_{in} \frac{P_{in}Q_{in}}{P_{ik}}$	$\forall i \in \mathbb{I},\ \forall k \in \{a,m,s\}$
$M3$	$\sum_{i=1}^{4} L_i T = \sum_{i=1}^{4} \sum_{k\in\{a,m,s\}} \phi_i w_{ik} L_{ik}$	

Notes: $\mathbb{I} = \{1, 2, 3, 4\}$. Rows D, S, and M collect the demand, supply, and market-clearing conditions that define the model equilibrium. Given exogenous fundamentals, the system jointly determines sectoral consumption, prices, trade shares, output, labor allocations, and aggregate transfers. The numerical solution imposes the complete system: $D1$ and $D3$ enter the demand block, $D2$ and $M3$ determine household expenditure and the aggregate transfer, $M2$ maps final demand into gross output through the input–output system, and $S1$–$S5$ and $M1$ determine prices, trade shares, revenues, wages, and labor allocations.

j equals final consumption: $P_{jk}Q_{jk} = P_{jk}C_{jk}$. Substituting into Equation (22), the expression simplifies to:

$$\ell_{ik} = \sum_{j=1}^{4} e_{jk} \cdot \frac{w_j L_j}{w_i L_i} \cdot \pi_{jik}, \tag{23}$$

where $e_{jk} := P_{jk}C_{jk}/E_j$ is the share of expenditure on sector k in country j, and E_j is total household expenditure. To derive e_{jk}, I use the sectoral demand expression from Equation (15) and the price index in Equation (17), which together yield:

$$e_{jk} = \omega_{jk}^{\sigma} \left(\frac{P_{jk}}{P_j}\right)^{1-\sigma} \left(\frac{C_j}{L_j}\right)^{(1-\sigma)(\varepsilon_k-1)}. \tag{24}$$

Using the price index identity from Equation (17), I obtain an expression for the sectoral price ratio $(P_{ik}/P_i)^{1-\sigma}$ as:

$$\left(\frac{P_{ik}}{P_i}\right)^{1-\sigma} = \left[\sum_{l\in\{a,m,s\}} \omega_{il}^{\sigma} \left(\frac{P_{il}}{P_{ik}}\right)^{1-\sigma} \left(\frac{C_i}{L_i}\right)^{(1-\sigma)(\varepsilon_l-1)}\right]^{-1}. \tag{25}$$

Substituting (25) into (24), the expression for e_{ik} becomes:

$$e_{ik} = \left[\sum_{l\in\{a,m,s\}} \left(\frac{\omega_{il}}{\omega_{ik}}\right)^{\sigma} \left(\frac{P_{il}}{P_{ik}}\right)^{1-\sigma} \left(\frac{C_i}{L_i}\right)^{(1-\sigma)(\varepsilon_l-\varepsilon_k)}\right]^{-1}. \tag{26}$$

Finally, the share of import of country j for sector-k goods sourced from sector i, π_{jik}, can be rewritten as:

$$\pi_{jik} = \left[1 + \sum_{l\neq i} \frac{T_{lk}}{T_{ik}} \left(\frac{v_{lk}}{v_{ik}}\right)^{-\theta} \left(\frac{\tau_{jlk}}{\tau_{jik}}\right)^{-\theta}\right]^{-1}. \tag{27}$$

Equation (26) illustrates how the two traditional mechanisms of structural change shape the sectoral employment shares. The first is the Engel effect, which arises from the nonhomotheticity of preferences, captured here by sector-specific income elasticities of demand. As aggregate consumption increases with income, expenditure shifts toward sectors with higher income elasticities. Consequently, the expenditure and employment shares of such sectors rise, while sectors with lower income elasticities experience a decline in both. This shift in labor shares is formalized in Equation (23), where changes in expenditure share e_{ik} induced by income growth translate into sectoral labor share ℓ_{ik}.

The second mechanism is the Baumol effect, which results from differential sectoral productivity growth in the presence of non-unitary substitution elasticities across goods. When the price of a sectoral good falls relative to others, households substitute away from it if the elasticity of substitution σ is less than one, leading to a decline in the sector's expenditure share e_{ik}, and consequently, its employment share ℓ_{ik}. Conversely, an increase in a sector's relative price raises its expenditure and labor shares, as households allocate a larger fraction of spending toward maintaining consumption of that good.

Equations (23) (26) and (27) together illustrate how trade cost reduction due to trade integration affects structural change by modifying both the relative prices of sectoral goods and the pattern of bilateral trade shares. First, a reduction in trade costs in sector k lowers the price index P_{ik} relative to other sectors. Given non-unitary substitution elasticities ($\sigma \neq 1$), this relative price decline reduces the sector's expenditure share e_{ik} via Equation (26), leading to a reallocation of labor away from sector k. Second, a decline in bilateral trade costs τ_{jik} for varieties produced in country i and exported to country j enhances the competitiveness of country i's goods in international markets. This increase in competitiveness raises the trade share π_{jik} in Equation (11), reflecting higher external demand for sector k's goods from country i. The resulting expansion in trade shares generates upward pressure on labor demand in sector k, potentially offsetting the decline induced by the relative price effect.

Equation (27) provides a direct link between partner development and the sectoral effects of trade-cost reductions. A decline in the bilateral trade cost τ_{jik} increases country i's competitiveness in country j's market and, all else equal, raises its share π_{jik} of country j's expenditure on sector-k goods. The magnitude and sectoral composition of the resulting trade flows, however, depend on the characteristics of the economies connected by the reduction in trade costs. In particular, country i's competitiveness in sector k depends on its fundamental productivity T_{ik} and its unit production cost, v_{ik}.

These objects capture several dimensions along which economies at different stages of development may differ, including sectoral productivity, labor costs, intermediate-input prices, and production structure. A higher T_{ik}, holding competitors' technologies fixed, raises π_{jik}, while lower production costs strengthen country i's competitiveness in sector k. What matters for trade-induced structural change is therefore not simply the aggregate productivity or income level of a trading partner, but its sectoral configuration of productivity and production costs, which determines its pattern of comparative advantage.

The development level of trading partners also matters through the demand side. As Equation (23) shows, the contribution of foreign demand to employment in sector k depends not only on the trade share π_{jik}, but also on the partner's sectoral expenditure share e_{jk} and relative market size $w_j L_j/(w_i L_i)$. Because nonhomothetic preferences generate systematic changes in expenditure patterns with income, economies at different levels of development demand different compositions of sectoral goods. A reduction in trade costs with an advanced economy can therefore generate a different pattern of external demand from an otherwise identical reduction in trade costs with a less developed economy. Moreover, a larger partner market magnifies the extent to which these demand patterns affect sectoral labor demand in the home economy.

Partner development therefore interacts with trade integration through both supply and demand channels. On the supply side, sectoral productivity, wages, and intermediate-input costs determine relative competitiveness and hence bilateral trade shares. On the demand side, income and expenditure patterns determine the sectoral composition of the foreign demand to which lower trade costs provide greater access. These forces need not operate in the same direction. For example, integration with an advanced economy may expose domestic producers to strong foreign competition in sectors in which the partner has a comparative advantage, while simultaneously increasing foreign demand for sectors in which the home economy is relatively competitive. The resulting sectoral reallocation depends on the balance between these forces.

Taken together, Equations (27), (23), and (26) imply that the effects of a given trade-cost reduction on structural change depend on the development characteristics of the economies it connects. Identical changes in trade costs can generate different sectoral trade flows, expenditure patterns, and labor allocations when trading partners differ in productivity, production costs, income, expenditure composition, or market size. For Mexico, this mechanism provides a theoretical rationale for why integration with the more advanced United States and Canada may have generated a different pattern of structural change than integration with economies at Mexico's own level of development. Because the different channels can reinforce or offset one another, however, the direction and magnitude of the overall effect cannot generally be determined analytically. I therefore turn next to the quantitative analysis, beginning with the calibration of the model.

4 Calibration

This section describes the strategy used to discipline the model with data. The parameters fall into two groups: time-invariant structural parameters that are either set from the literature or identified from cross-sectional moments, and exogenous time series that are recovered period by period to match observed data. Before describing the calibration procedure, I first describe the data employed in the analysis and their sources.

4.1 Data Description

The model contains four countries: Mexico, the United States, Canada, and a rest-of-the-world (ROW) which includes Australia, Austria, Belgium, Brazil, China, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, India, Ireland, Italy, Japan, South Korea, Luxembourg, Netherlands, Portugal, Sweden and Taiwan. The dataset covers the period 1971–2018. Refer to Appendix D for data details and coverage notes.

I aggregate data into three sectors following the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4: agriculture (including forestry and fishing), manufacturing (including mining and utilities), and services (all remaining activities). The calibration requires sectoral data for employment, value added, gross output, input-output coefficients, imports, exports, and gross-output prices. These data come from several sources.

Sectoral employment, nominal and real value added, real and nominal gross output, bilateral trade flows, and input-output linkages are compiled primarily from EU KLEMS, WIOD, and the OECD Inter-Country Input-Output (ICIO) tables. For countries or years not covered by those sources, the series are supplemented with the GGDC 10-Sector Database, the GGDC Productivity Level Database, BEA employment data for the United States, Statistics Canada employment data, UN sectoral value-added data for selected gaps, Penn World Table population and income data, and World Bank WDI services-trade data. Sectoral gross-output price indexes $P_{ik,t}$, used throughout the calibration as the price of the composite good in Equation (7), are constructed as nominal gross output divided by PPP-adjusted real gross output. Bilateral trade flows, measured in millions of U.S. dollars, are used to construct the bilateral trade share matrices $\pi_{ijk,t}$, while the input-output coefficients λ_{ik} and γ_{ikn} are calibrated directly from input-output tables and averaged over the available sample period.

For ROW variables, employment and nominal variables are aggregated by summation. Real variables are constructed using Tornqvist growth aggregation within each source and then benchmarked to 2005 PPP prices.[4]

Having described the data, I now turn to the calibration procedure. I begin by calibrating the parameters that are assumed to remain constant over time.

4.2 Time-Invariant Parameters

The time-invariant parameters of the model include the trade elasticity θ, the elasticity of substitution across varieties η, the preference parameters σ, ε_k, and ω_{ik}, as well as the production parameters λ_{ik} and γ_{ikn}.

I set the trade elasticity to $\theta = 4$. This value lies within the range of empirical estimates surveyed by Simonovska & Waugh (2014) and is widely adopted in quantitative trade models of structural change (Uy et al. 2013, Sposi 2019). I also set the elasticity of substitution across varieties to $\eta = 2$, following De Vries et al. (2026). As in Eaton–Kortum models, this parameter plays only a limited quantitative role in determining equilibrium allocations.[5]

For preferences, I adopt the estimates in Sposi et al. (2026), which are estimated on the basis of a sample of 28, comprising the 25 countries included in this study and three other countries. Specifically, I set the elasticity of substitution across sectoral composite goods to $\sigma = 0.233$, and the income elasticity parameters to $\varepsilon_a = 0.086$, $\varepsilon_m = 0.860$, and $\varepsilon_s = 1.146$.

The remaining preference parameters are the sectoral preference weights ω_{ik}. I calibrate these parameters separately for each country by choosing the values that best replicate, in the initial year of the sample, both the observed sectoral labor shares and the cross-country gap in real consumption per worker relative to Mexico.[6]

Finally, I calibrate the production parameters λ_{ik} and γ_{ikn} using input–output data. The parameter λ_{ik} is computed as the average intermediate-input share in nominal gross output, $1 - VA_{ik}/GO_{ik}$, for sector k in country i. The input–output coefficients γ_{ikn}, which measure the sectoral composition of intermediate inputs used in sector k, are constructed from national input–output tables after aggregating industries into the three sectors of the model. For each country, I compute these shares annually and use their time average in the calibration. Table 2 reports values of key parameters yielded by calibration.

[4] Appendix D.7 describes the Tornqvist aggregation procedure.

[5] The chosen value satisfies the restrictions $\eta > 1$ and $\eta < 1 + \theta$, ensuring that the Frechet price index remains well defined.

[6] I target cross-country income gaps because development differences play a central role in the analysis.

Table 2: Time-Invariant Parameters

Description	Param.	Value			Source
Trade elasticity	θ	4			Simonovska & Waugh (2014)
Substitution between varieties	η	2			De Vries et al. (2026)
Substitution between sectors	σ	0.233			Sposi et al. (2026)
Income elasticities	ε_a	0.086			Sposi et al. (2026)
	ε_m	0.860			Sposi et al. (2026)
	ε_s	1.146			Sposi et al. (2026)
		Agr.	Mfg.	Svc.	
Ratio of intermediates to gross output		λ_{ia}	λ_{im}	λ_{is}	
Mexico		0.330	0.576	0.228	
Canada		0.547	0.600	0.352	
United States		0.564	0.581	0.349	
Rest of World		0.416	0.662	0.381	

Notes: The table reports time-invariant parameters used in the baseline calibration. Preference parameters are taken from Sposi et al. (2026); production parameters are calibrated from the input-output data as described in Section 4.2.

4.3 Time-Varying Exogenous Processes

This subsection describes the calibration of the main time-varying exogenous variables in the model: wage wedges, trade imbalances, sectoral productivity and bilateral trade costs, . Each country's labor endowment is set equal to observed total sectoral employment.

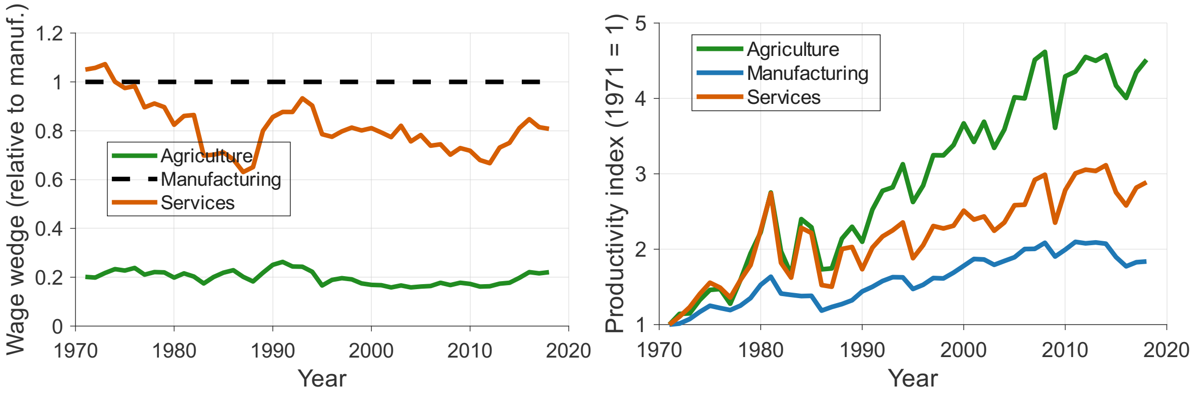
The model allows for sectoral wage differentials within each country and calibrates them from the data. The wage in sector k of country i satisfies $w_{ik} = \xi_{ik} w_{im}$, where the manufacturing wedge ξ_{im} is normalized to one. I compute the wedge directly as

$$\xi_{ik,t} = \frac{VA_{ik,t}/L_{ik,t}}{VA_{im,t}/L_{im,t}}, \quad k \in \{a, s\} \tag{28}$$

These ratios are computed from the data in each year and treated as time-varying observed parameters rather than structural parameters to be solved for. This approach follows Buera & Kaboski (2009) and Swiecki (2017), who argue that observed wage differentials reflect labor-market frictions and distortions that are better modeled as wedges than as equilibrium outcomes.

The left panel of Figure 3 shows that these wedges are quantitatively important for Mexico. Agricultural value added per worker is persistently far below manufacturing value added per worker: the agricultural wedge is 0.20 in 1971, fluctuates between 0.16 and 0.26, and is 0.22 in 2018. The services wedge is closer to manufacturing, but it declines from 1.05 in 1971 to 0.81 in 2018. These patterns matter for the model because employment and value-added shares need not move one-for-one in the data. If all sectoral wages were forced to be equal, the model would attribute too much of the gap between employment and value added to technology or trade costs. Treating $\xi_{ik,t}$ as an observed wedge allows the calibration to preserve measured sectoral labor-cost differences while focusing the counterfactual analysis on technology, trade costs, and partner characteristics.

Trade imbalances $\phi_{i,t}$ are modeled as a country-specific fraction of income contributed to the global portfolio. Given observed net exports $NX_{i,t}$ from the data, the parameters $\phi_{i,t}$ and the per-capita global transfer T_t are jointly recovered from the model's trade-balance conditions. This linear system in $\{\phi_{i,t}\}$ is solved period by period, with T_t pinned down by the global budget constraint M3 in Table 1.



(a) Mexico: Sectoral Wage wedges (b) Mexico: Calibrated Sectoral Productivities

Figure 3: Mexico: Calibrated Sectoral Wage Wedges and Productivities

Notes: The left panel plots calibrated sectoral wage wedges $\xi_{ik,t}$ for Mexico. The manufacturing wedge $\xi_{im,t}$ is normalized to one. The right panel plots calibrated sectoral productivity indexes, normalized to the 1971 value.

I compute productivity in two steps. I retain the direct inversion of the domestic trade-share equation:[7]

$$T_{ik,t} = \pi_{iik,t} \left(\frac{P_{ik,t}}{\gamma} \right)^{-\theta} v_{ik,t}^{\theta}, \tag{29}$$

where γ is the Fréchet price constant and $v_{ik,t}$ the unit costs. The wage entering this unit-cost calculation is the normalized sectoral wage $w_{ik,t} = \xi_{ik,t} \bar{w}_{im,t}$, where $\bar{w}_{im,t}$ is the observed value added per worker in manufacturing in country i. In the benchmark, all wages are measured relative to the base-year U.S. manufacturing wage. Thus, the manufacturing-wage path disciplines cross-country and time-series labor costs, while $\xi_{ik,t}$ introduces the observed within-country sectoral deviations from manufacturing.

Taking the ratio of an import share to the importer's domestic share in Equation (11) eliminates the common price-denominator term:

$$\frac{\pi_{jik,t}}{\pi_{jjk,t}} = \frac{T_{ik,t}\, v_{ik,t}^{-\theta}\, \tau_{jik,t}^{-\theta}}{T_{jk,t}\, v_{jk,t}^{-\theta}},$$

and therefore

$$\tau_{jik,t} = \left[\frac{T_{ik,t}}{T_{jk,t}} \left(\frac{v_{ik,t}}{v_{jk,t}} \right)^{-\theta} \frac{\pi_{jjk,t}}{\pi_{jik,t}} \right]^{1/\theta}, \qquad i \neq j, \tag{30}$$

with $\tau_{iik,t} = 1$.

The right panel of Figure 3 reports the implied productivity paths for Mexico, expressed as the Fréchet productivity index $A_{ik,t} \propto T_{ik,t}^{1/\theta}$, normalized to 1971. It shows that productivity growth is sector biased. By 2018, Mexico's productivity index is 4.51 in agriculture, 1.84 in manufacturing, and 2.89 in services, relative to 1971. Table A.3 in Appendix B.1 reports the same productivity index for all countries in the model while Figure A.1 shows their evolution. The same pattern emerges across countries: agriculture has the highest growth, followed by services and then manufacturing.

Following the interpretation in De Vries et al. (2026), I view the recovered $\tau_{jik,t}$ series as broad bilateral-sectoral wedges rather than tariff measures alone. They summarize the combination of tariffs, transportation costs, border frictions, non-tariff barriers, measurement error,

[7]This relation yields from a combination of conditions S1 and S3 in Table 1 so that the baseline calibrations are designed to map the observed sectoral prices, $P_{ik,t}$, and absorption shares, $\pi_{iik,t}$.

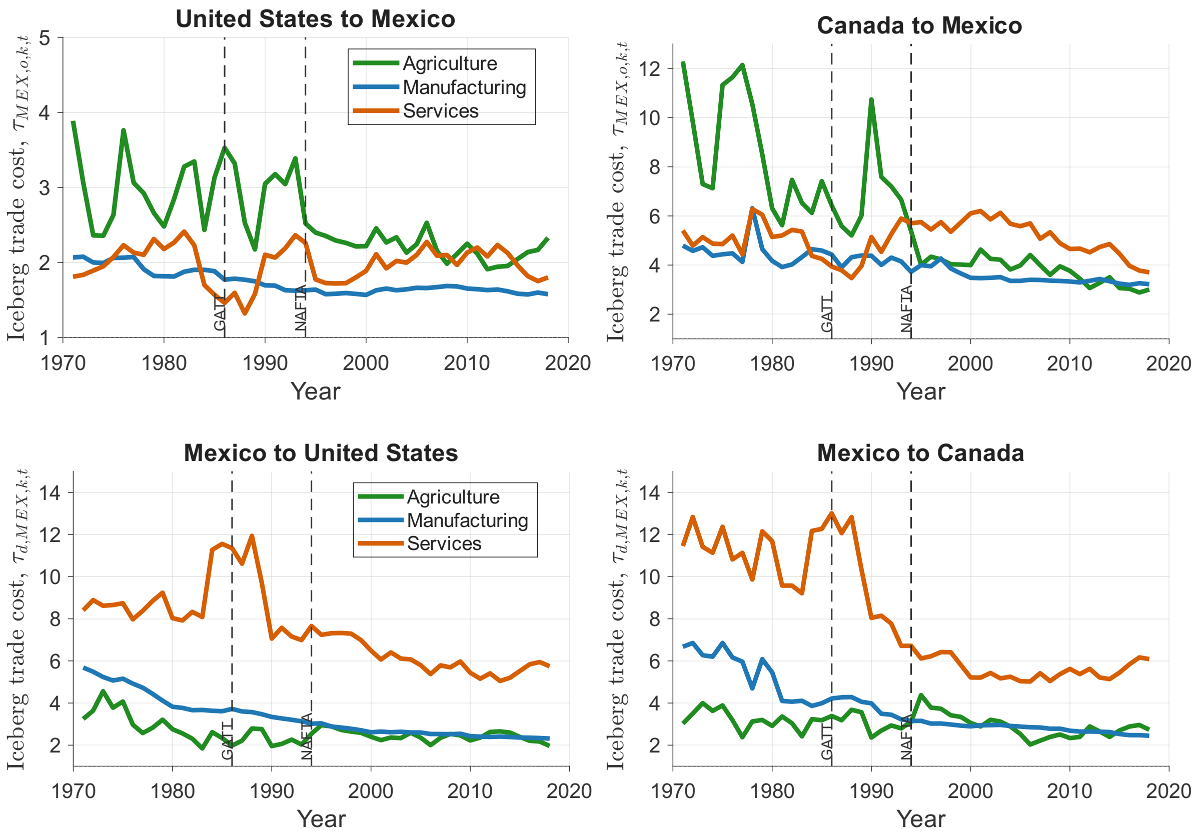


Figure 4: Mexico: Calibrated Inbound and Outbound Trade Costs

Notes: The top row plots calibrated iceberg trade costs $\tau_{MEX,o,k,t}$ for goods shipped from origin $o \in \{USA, CAN\}$ to Mexico. The bottom row plots $\tau_{d,MEX,k,t}$ for Mexican shipments to destination $d \in \{USA, CAN\}$. Vertical lines mark GATT entry in 1986 and NAFTA in 1994.

and other forces needed for the model to rationalize observed bilateral sourcing. Figure 4 shows that these wedges are highly asymmetric across partners and sectors. U.S.-to-Mexico costs are lower than Canada-to-Mexico costs throughout most of the sample and decline in agriculture and manufacturing between 1971 and 2018, from 3.89 to 2.33 and from 2.07 to 1.58, respectively. Canada-to-Mexico costs begin at much higher levels, especially in agriculture, and fall from 12.29 to 3.00 in agriculture, 4.79 to 3.22 in manufacturing, and 5.41 to 3.71 in services.

The outbound paths reinforce the same point. Mexico-to-U.S. costs fall between 1971 and 2018 from 3.24 to 1.96 in agriculture, 5.68 to 2.31 in manufacturing, and 8.40 to 5.74 in services. Mexico-to-Canada costs fall from 3.02 to 2.73 in agriculture, 6.67 to 2.45 in manufacturing, and 11.45 to 6.09 in services. Services remain the highest-cost sector for export from Mexico to both North American destinations, with high values between the 1980s and 1990s.

I now turn to the model's fit to the main allocation moments.

4.4 Model Fit

I assess the model along two dimensions that are central to the analysis: sectoral employment shares and nominal value-added shares. This distinction is particularly important for a country such as Mexico, where sectoral employment and value-added shares differ substantially. Examining both outcomes allows me to assess how economic policies affect the allocation of labor and economic activity across sectors, as well as whether they contribute to a convergence between these two dimensions of structural change.

The calibration matches the initial sectoral allocation through the preference weights and uses observed prices and trade shares to recover the paths of sectoral productivity and bilateral trade costs. Importantly, the calibration does not mechanically target the subsequent paths of employment or value-added shares. The model-fit exercise therefore provides an informative assessment of whether the calibrated economy can reproduce the broad evolution of structural change using a parsimonious set of preference parameters, sectoral wage wedges, productivity paths, and bilateral trade costs.

Table 3 summarizes the fit over 1971–2018. Across all country-sector cells, the employment-share RMSE is 2.18 percentage points and the corresponding value-added-share RMSE is 1.83 points. Aggregating within countries, the employment-share RMSEs are 2.95 points for Mexico, 1.41 for Canada, 1.35 for the United States, and 2.55 for the ROW. The corresponding value-added-share RMSEs are 2.64, 1.53, 1.60, and 1.26 points.[8] Despite a correlation of 0.43 in Mexico's manufacturing sector, the RMSE in that sector is moderate (2.64 percentage points), indicating that the model is unable to capture the inflection points observed between 1980 and 1990. As can be seen in the figure, the fit remains very good.

Table 3: Model Fit: Employment and Value-Added Shares

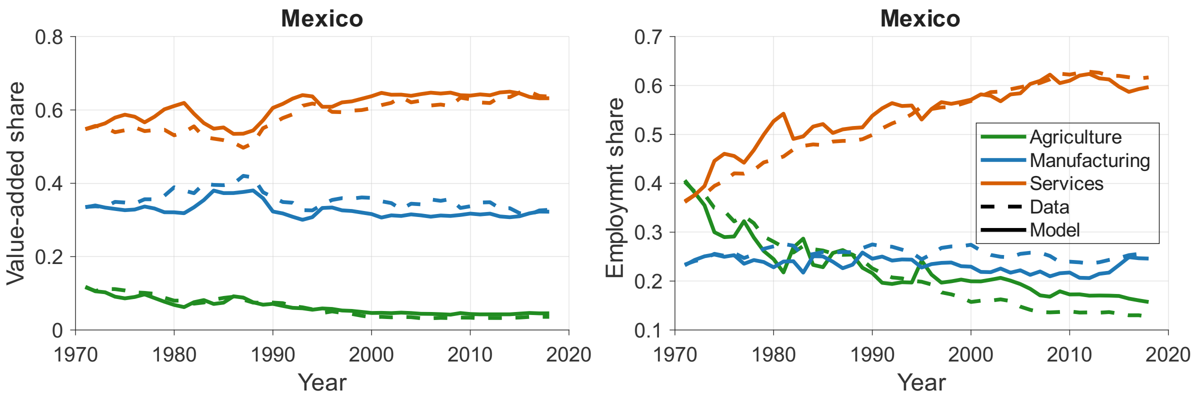
	RMSE (pp)			Correlation		
Country	Agr.	Mfg.	Svc.	Agr.	Mfg.	Svc.
Panel A: Employment shares						
Mexico	3.17	2.64	3.01	0.948	0.431	0.952
Canada	0.68	1.35	1.91	0.902	0.924	0.932
United States	0.32	1.52	1.74	0.856	0.996	0.996
Rest of World	3.35	1.02	2.68	0.948	0.935	0.944
All countries		2.18			0.897	
Panel B: Nominal value-added shares						
Mexico	1.02	3.14	3.15	0.963	0.767	0.900
Canada	0.54	1.61	2.03	0.960	0.874	0.902
United States	0.27	1.87	2.02	0.982	0.990	0.992
Rest of World	0.66	1.19	1.70	0.948	0.948	0.952
All countries		1.83			0.932	

Notes: RMSE is the root mean squared error in percentage points between model and data shares over 1971–2018. Correlation is the time-series Pearson correlation between simulated and observed shares.

Figures 5 and 6 provide the corresponding visual comparison. For Mexico, the model captures the decline in agriculture and the rise of services, while the manufacturing path is harder to match year by year. For the partner economies, the fit is smoother, reflecting the more gradual sectoral transitions in Canada, the United States, and the ROW aggregate. The main implication is that the model reproduces the level and direction of the allocation moments sufficiently well to use it for comparative counterfactuals.

Figure A.4 and Table A.4 in Appendix B provide an additional validation exercise based on nominal gross-output shares. These moments are not direct allocation targets in the calibration, which is disciplined primarily by employment, value added, prices, input-output coefficients, and trade shares. Across all country-sector cells, the gross-output-share RMSE is 2.86 percentage points, and the mean time-series correlation is 0.863. Therefore, the model also tracks the sectoral composition of gross output supports the internal consistency of the production side of the calibrated economy.

[8] Country-level RMSEs are computed as the root mean squared error pooling the three sectoral RMSEs within each country, rather than their simple arithmetic average.



(a) Sectoral Value-Added Shares

(b) Sectoral Employment Shares

Figure 5: Sectoral Value-Added and Employment Shares: Data and Model

Notes: The left panel plots Mexico's nominal value-added shares and the right panel plots Mexico's employment shares. Dashed lines are observed data and solid lines are model-implied shares from the baseline annual calibration. Colors identify agriculture, manufacturing, and services.

Overall, our calibration reproduces the most relevant empirical patterns of structural change for the four countries over time. I now turn to counterfactual exercises that isolate how the development level of trade partners affects Mexico's structural-change path.

5 Quantitative Counterfactual Experiments

In this section, I quantify the role of level of development of trading partners in shaping structural change in Mexico. While the existing literature has quantified the effects of trade shocks on structural change, these estimated effects inherently combine the consequences of changes in trade costs with the influence of trading partners' development levels. In particular, the same trade-cost shock may have different implications for structural change depending on the income level, sectoral demand structure, and production structure of the countries with which an economy trades. To isolate this dimension for the Mexican economy, I conduct a series of counterfactual experiments designed to disentangle the role of trading partners' development levels from the effects associated with changes in trade costs.

5.1 Experiment Design

I construct two counterfactual environments to isolate how differences in development levels between trading partners shape the effects of trade integration on structural change. The first is a symmetric-development environment for Mexico, denoted *Mexico-symmetric*. In this environment, I replace developmen bundle — sectoral wage wedges, manufacturing-wage paths, preference weights and the initial sectoral productivity levels — of the United States and Canada with their Mexican counterparts. I treat these series as development characteristics because they summarize the productive efficiency level, sectoral labor-cost structure, relative earnings, and initial expenditure composition that differ systematically between middle-income and high-income economies. The productivity replacement is an initial-level shift: each partner keeps its own sector-specific productivity-growth path after 1971. I include preference weights in the development bundle because they are calibrated to match country-specific initial expenditure shares, which vary systematically with the level of development. The resulting environment approximates a setting in which Mexico trades with partners at a similar stage of development.

The second environment, denoted *Canada-level Mexico*, replaces Mexico's own development bundle with Canada's. Thus Mexico receives Canada's initial sectoral productivity levels, sec-

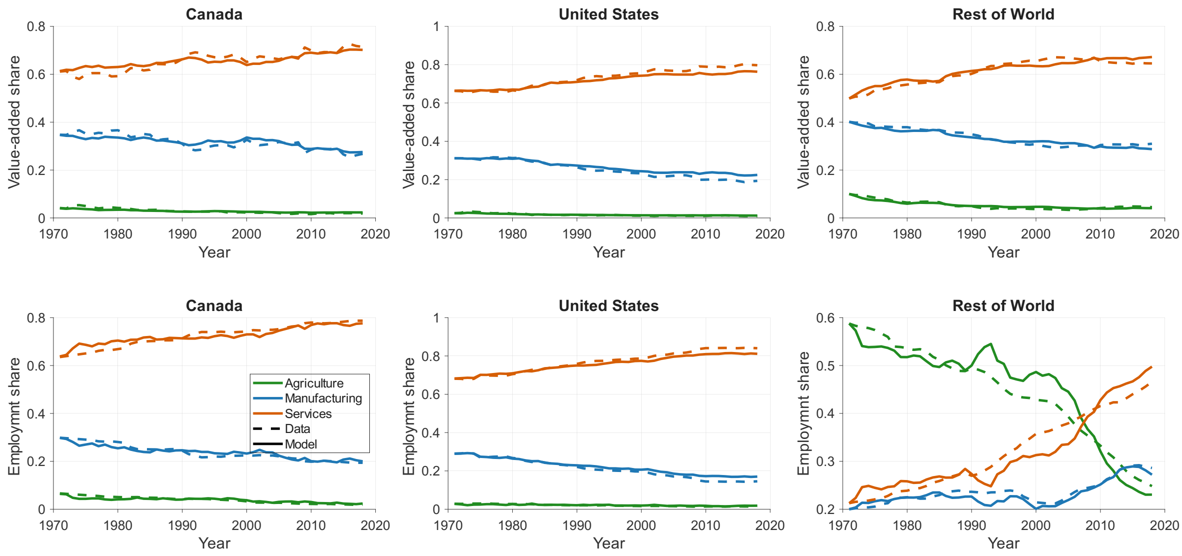


Figure 6: Sectoral Value-Added and Employment Shares: Data and Model, Partner Economies

Notes: The first row plots nominal value-added shares and the second row plots employment shares for Canada, the United States, and the rest of the world. Dashed lines are observed data and solid lines are model-implied shares from the baseline annual calibration. Colors identify agriculture, manufacturing, and services.

toral wage wedges, manufacturing-wage path, and preference weights, but it retains Mexico's own sectoral productivity-growth rates, labor endowment, trade imbalance, input–output coefficients, geography, partners, and bilateral trade-cost paths.

The counterfactual replacement of sectoral wage wedges, manufacturing-wage paths, preference weights, and initial sectoral productivity levels is not an arbitrary relabeling of countries. Figures A.2 and A.3 in Appendix B.2 report the evolution of these variables for Mexico, Canada, the United States, and the rest of the world. These diagnostics reveal systematic differences associated with countries' levels of development. Canada and the United States exhibit similar sectoral wage wedges and manufacturing-wage paths, both of which differ markedly from those observed in Mexico. Similarly, initial sectoral productivity levels are relatively close in Canada and the United States but differ substantially from those in Mexico. By contrast, subsequent productivity growth does not exhibit the same systematic cross-country differences. Taken together, these patterns motivate treating initial sectoral productivity levels, sectoral wage wedges, and manufacturing-wage paths as components of the development bundle in the model. Moreover, preference weights are calibrated to match country-specific initial expenditure shares, which vary systematically with the level of development. Accordingly, replacing a country's initial sectoral productivity levels, sectoral wage wedges, manufacturing-wage paths, and preference weights with those of another country assigns the development characteristics of the latter to the former.

Within each development environment, I evaluate the effects of the global trade-integration and the key two trade liberalization episodes GATT and NAFTA. The *Mexico-symmetric* experiment asks how Mexico's structural change would have responded to the observed trade-cost reductions if its two main trading partners, the United States and Canada, had not been advanced economies but instead had Mexico-level development characteristics. Comparing the effects of trade integration obtained under *Mexico-symmetric* with those in the baseline isolates the contribution of the development gap between Mexico and its trading partners. The *Canada-level Mexico* experiment addresses a complementary question: how would the observed reductions in trade costs have affected Mexico's structural change if Mexico had exhibited the development characteristics of an advanced economy such as Canada? Comparing the effects of trade integration in this environment with those for actual Mexico therefore reveals how Mexico's own level of development shapes the consequences of trade integration on structural change.[9]

I consider three counterfactual trade-cost paths corresponding to distinct stages of Mexico's integration into the world economy. The *no-Mexico-integration* counterfactual fixes bilateral trade costs involving Mexico at their 1971 levels throughout the sample. The *no-GATT* counterfactual holds Mexico's bilateral trade costs at their 1985 levels from 1986 onward. Finally, the *no-NAFTA* counterfactual holds intra-North-American trade costs at their 1993 levels from 1994 onward. Applying identical trade-cost counterfactuals across the baseline, *Mexico-symmetric*, and *Canada-level Mexico* environments allows me to distinguish the effect of the trade-cost reductions themselves from the extent to which those effects depend on development characteristics. Table A.1 summarizes the experimental design, while Appendix A provides details on the construction of each counterfactual and the corresponding effect definitions.

One construction detail deserves emphasis. The *no-GATT* counterfactual freezes Mexico's bilateral trade costs at their 1985 level from 1986 onward, through the end of the sample in 2018; it is not reactivated in 1994 (Table A.2). Consequently, the reported GATT effect is not restricted to the 1986–1993 window and mechanically nests the subsequent NAFTA-era trade-cost decline within it. The *GATT* and *NAFTA* effects reported below should therefore be read, respectively, as the effect of Mexico's entire post-1985 trade-cost path (inclusive of NAFTA) and as the effect of the incremental North-American-specific trade-cost change after 1993, rather than as two mutually exclusive components of an additive decomposition of total trade integration. I adopt this convention because it corresponds to the natural counterfactual question of what would have happened had Mexico's post-1985 opening never occurred, while ensuring that the GATT- and NAFTA-specific magnitudes are not misread as summing to the total integration effect.

The calibrated exogenous series exhibit substantial year-to-year variation in some periods. Because the model is solved as a sequence of static annual equilibria, annual fluctuations in technologies, recovered trade costs, sectoral wage wedges, and manufacturing-wage paths pass directly into the counterfactual outcomes.[10] The resulting fluctuations should therefore be interpreted as equilibrium responses to high-frequency variation in the recovered exogenous environment. To distinguish these movements from the lower-frequency economic patterns of interest, I report results from both the annual calibration and an additional set of simulations based on smoothed exogenous primitives.

For the smoothed specification, I conduct a second set of simulations using HP-filtered exogenous primitives.[11] Specifically, I filter sector-country technologies, sectoral wage wedges, manufacturing-wage paths, and bilateral trade costs. I filter trade costs separately over 1971–1985, 1986–1993, and 1994–2018 to prevent the filtering procedure from mechanically shifting trade-cost changes associated with GATT or NAFTA across policy regimes. Labor endowments, trade imbalances, preference weights, and input–output coefficients remain at their calibrated values. Importantly, the smoothing is applied only to the exogenous primitives. I then recompute the equilibrium using these filtered series, rather than smoothing the resulting equilibrium outcomes ex post.

Having described the construction of the counterfactual experiments, I now turn to the quantitative results. I organize the analysis in three steps. First, I isolate the role of level of

[9] *Canada-level Mexico* does not make Mexico and Canada identical. Mexico retains its labor endowment, trade imbalance, input–output coefficients, geography, set of trading partners, and bilateral trade-cost paths. The experiment therefore isolates development characteristics from differences in country size and location. Section 5.4 provides a separate counterfactual analysis of the role of partner size.

[10] These fluctuations do not reflect numerical instability. In diagnostic checks, the complete set of counterfactual equilibria converges at the specified solver tolerance, with negligible equilibrium residuals.

[11] I apply the Hodrick–Prescott filter to strictly positive primitives in logs, using $\lambda = 6.25$, as recommended by Ravn & Uhlig (2002) for annual data.

development of trading partners in shaping Mexico's structural change. Second, I quantify the effects of trade-cost reductions and examine how these effects interact with the development level of Mexico and its trading partners. Finally, I assess the role of partner market size in determining the magnitude of the effect of trade integration on Mexico's structural change.

5.2 The Development Level of the Trade Partner

Figure 7 compares Mexico's predicted employment and nominal value-added shares under the baseline simulation with those obtained in the *Mexico-symmetric* environment. The lighter lines report results based on the annually calibrated primitives, whereas the darker lines report equilibrium outcomes recomputed using HP-filtered primitives. The two specifications deliver similar lower-frequency patterns, indicating that the main results are not driven by the high-frequency variation in the annually calibrated exogenous series.

The results show that Mexico's pattern of structural change would have been substantially different had it traded with partners sharing its development characteristics rather than with advanced economies such as the United States and Canada. Relative to the baseline, the *Mexico-symmetric* environment predicts, on average, an agricultural employment share approximately 10 percentage points higher and a manufacturing employment share approximately 10 percentage points lower. The effect on the services employment share is comparatively small and becomes negligible after the 1990s. Thus, the development characteristics of Mexico's trading partners primarily affect the allocation of labor between agriculture and manufacturing. Therefore, the findings highlight that trading with advanced economies contributes to a faster movement of workers out of agriculture and into manufacturing than would occur if Mexico traded with otherwise comparable partners at its own level of development.

The results for nominal value-added shares reveal a broadly similar pattern, although the magnitude of the effects varies more substantially over time and across sectors. The difference between the value-added share predicted in the baseline and the *Mexico-symmetric* is particularly pronounced in agriculture before 1990 and becomes smaller thereafter, while the differences in manufacturing and services become relatively more important. By 2018, the baseline framework generates an agricultural value-added share 3.93 percentage points lower and a services share 9.42 percentage points lower than in the *Mexico-symmetric* environment. Conversely, the manufacturing value-added share is 13.35 percentage points higher. These results indicate that the development level of Mexico's trading partners has played an economically important role in shaping both the employment and value-added dimensions of its structural change, with the strongest effect operating through the expansion of the manufacturing sector.

To identify which trading partner drives the partner-development effect, I conduct an additional set of counterfactual experiments in which I replace the development characteristics of the United States and Canada separately. Table A.5 in Appendix B.4 reports the results, while Figure 8 illustrates their evolution over time. The results show that assigning Mexico-level development characteristics to the United States alone generates employment and value-added shares that are close to those obtained when both the United States and Canada are reassigned Mexico-level development characteristics. In 2018, the development characteristics of the United States reduce Mexico's agricultural employment share by 9.26 percentage points, increase the manufacturing share by 11.15 points, and reduce the services share by 1.88 points. These effects are close to the corresponding effects of −10.36, +11.76, and −1.39 percentage points in the full *Mexico-symmetric* experiment. By contrast, the effects associated with Canada's development characteristics are considerably smaller, at −0.58, +2.24, and −1.66 percentage points for agriculture, manufacturing, and services, respectively. The value-added results display a similar pattern. These findings indicate that the partner-development effect identified in the *Mexico-symmetric* experiment is driven primarily by the United States. Mexico's integration with the substantially more advanced U.S. economy therefore accounts for most of the estimated relationship between partner development and Mexico's structural change.

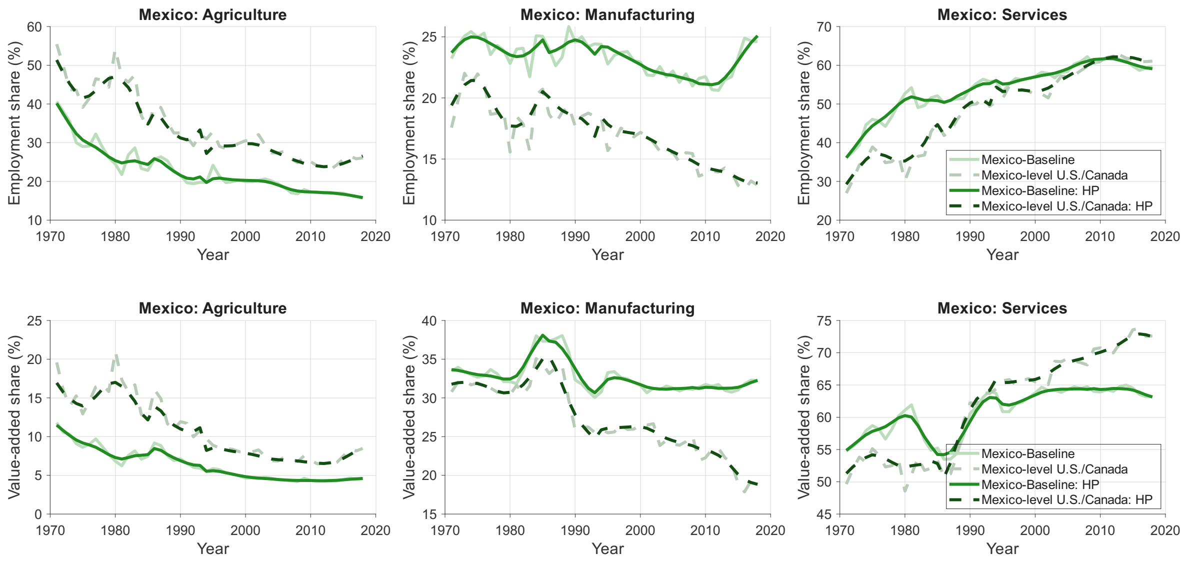


Figure 7: Structural Change for Actual Mexico and Mexico-Symmetric Partners

Notes: The figure compares the baseline predictions with *Mexico-symmetric* predictions, in which the United States and Canada receive Mexico-level initial productivity levels, wage wedges, manufacturing-wage paths, and preference weights while retaining their own productivity-growth paths. The top panels plot sectoral employment shares while the bottom panels plot nominal value-added shares. Lighter lines use the annual calibrated primitives; darker lines use equilibria recomputed from HP-filtered primitives.

5.3 Trade-Cost Changes and Partner Development

This section quantifies the contribution of Mexico's trade integration to structural change and examines how its effects depend on the development level of Mexico's trading partners. Table 4 and Figure 9 show that partner development affects both the magnitude and the sectoral composition of the response to changes in trade costs. Relative to the no-integration counterfactual, in which trade costs are held at their initial levels, the baseline simulation implies substantial changes in Mexico's value-added structure. In particular, trade integration increases the manufacturing value-added share by 12.11 percentage points and reduces the services value-added share by 12.01 percentage points by 2018. When the United States and Canada are instead assigned Mexico-level development characteristics, the same trade-cost path changes the value-added shares of agriculture, manufacturing, and services by $+2.57$, $+2.83$, and -5.40 percentage points, respectively. The manufacturing expansion and services contraction are therefore much smaller when Mexico faces same-level partners, while agriculture changes sign. Partner development affects the relative strength and composition of the sectoral responses to trade integration rather than simply scaling the effects uniformly across sectors.

The employment-share results display a qualitatively similar dependence on partner development, although the sectoral magnitudes differ from those for value added. In the baseline framework, Mexico's trade integration increases the manufacturing employment share by approximately 10 percentage points by 2018, largely at the expense of services. Under the *Mexico-symmetric* environment, however, the same trade-cost path produces a markedly different pattern of labor reallocation: the agricultural employment share increases by 6.90 percentage points, the services share declines by 8.21 percentage points, and the manufacturing share remains nearly unchanged. Thus, in the baseline framework, trade integration retains labor in manufacturing that would otherwise have been reallocated toward services. With Mexico-level trading partners, however, the same trade-cost reductions instead retain labor in agriculture that would otherwise have moved toward services. This difference also reflects the role of partner labor-market characteristics. In the *Mexico-symmetric* environment, Mexico's trading partners inherit Mexico's sectoral wage wedges, which affect their sectoral production and export re-

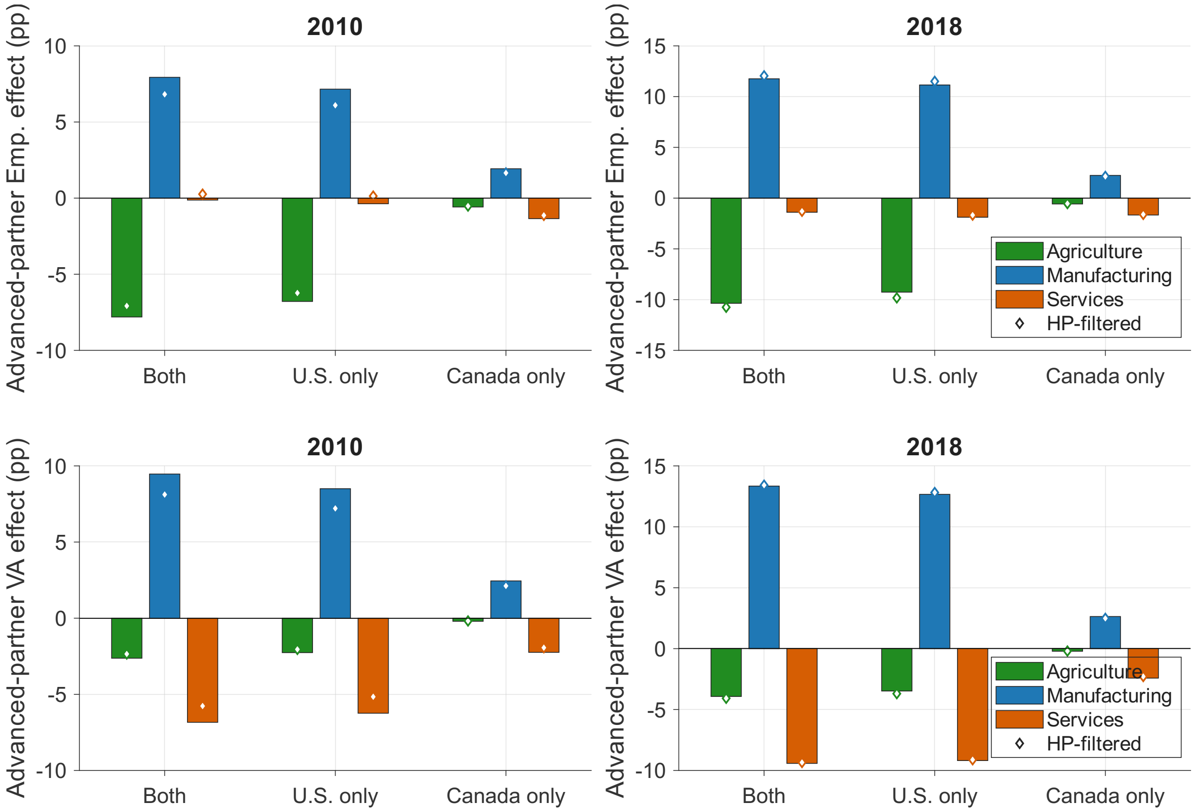


Figure 8: Mexico: Partner Contributions to the Development Effect

Notes: The four panels report Mexico's advanced-partner effects in 2010 and 2018. The top row plots effects on employment share, and the bottom row plots effects on nominal value-added share. Within each panel, bars decompose the effect of replacing the development characteristics of both North American partners, the United States only, or Canada only with Mexico-level counterparts. Positive bars mean that actual advanced partners raise Mexico's sector share relative to the corresponding Mexico-level-partner environment. Bars use annual calibrated primitives; diamond markers report equilibria recomputed from HP-filtered primitives.

sponses to lower trade costs and, through international trade, the pattern of labor reallocation in Mexico. The effects of trade integration on structural change therefore depend not only on the trade-cost shock itself, but also on the labor-market characteristics associated with the development level of Mexico's trading partners.

Another way to assess how the development gap between Mexico and its trading partners shapes structural change is to examine how trade integration would have affected Mexico had it exhibited the development characteristics of an advanced economy. The *Canada-level Mexico* environment, in which Mexico's development characteristics are replaced with those of Canada, provides a framework for this exercise. As shown in Figure A.5, under these characteristics, developed Mexico exhibits a pattern of structural change resembling that of an advanced economy. Agriculture begins with relatively small employment and value-added shares (below 10 percent) which decline further over time to approximately 4 percent by 2018. Manufacturing also experiences a sustained decline in both employment and value-added shares, while services expand steadily, reaching approximately 80 percent by 2018. Furthermore, the shares of employment and value added are no longer as divergent as they are in the current Mexican economy. Thus, assigning Canada-level development characteristics to Mexico fundamentally changes the baseline pattern of sectoral reallocation, providing a distinct environment in which to evaluate how the effects of trade integration depend on the home country's stage of development.

Under *Canada-level Mexico*, the full observed Mexico-integration path reduces the manufacturing employment share by 6.56 percentage points and increases the services share by 7.65 percentage points by 2018, relative to the no-integration counterfactual. In the baseline simulation, the corresponding effects are +9.60 and −9.64 percentage points, respectively. A similar pattern emerges for value-added shares. Thus, a Mexico with Canada-level development characteristics facing the same observed trade-cost path would experience a pattern of structural change opposite to that in the baseline economy. Rather than retaining economic activity in manufacturing relative to services, trade integration would accelerate its reallocation toward services. Development characteristics therefore shape not only the magnitude of the response to trade-cost reductions but also the direction of sectoral reallocation. This result further shows that the effects of trade integration on structural change depend critically on the development gap between trading partners.

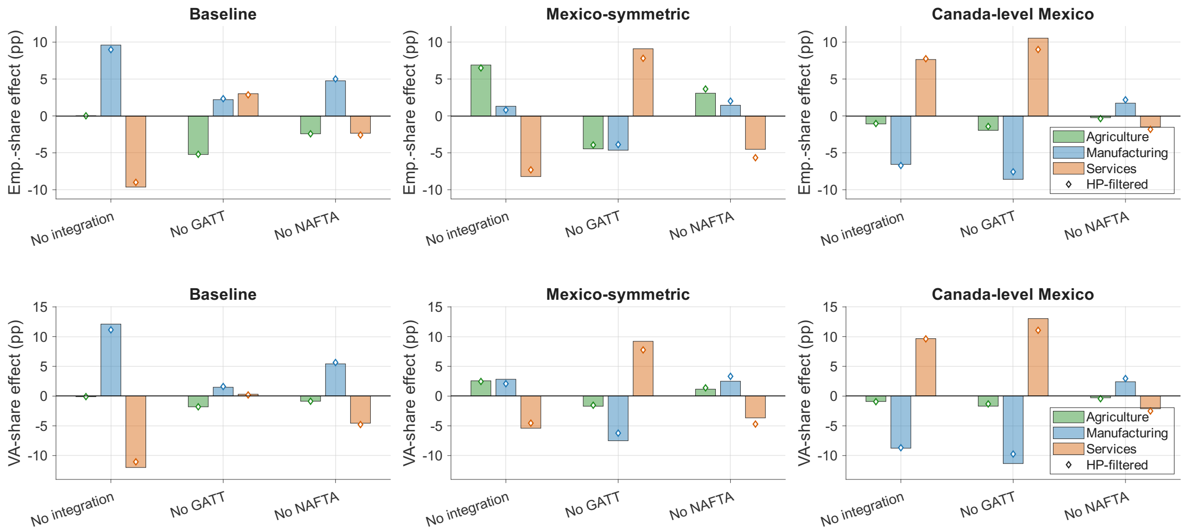


Figure 9: Trade-Cost Effects for Actual and Canada-Level Mexico

Notes: The top row reports the effects of the baseline trade-cost path on 2018 employment shares, measured in percentage points relative to three counterfactuals with frozen trade-cost paths: no integration, no GATT, and no NAFTA. Results are reported for the baseline (left), *Mexico-symmetric* (middle), and *Canada-level Mexico* (right) environments. Bars report results based on the annually calibrated primitives, while diamond markers report equilibrium outcomes recomputed using HP-filtered primitives. Positive values indicate that the observed trade-cost changes increase the sectoral employment share relative to the corresponding frozen-path counterfactual. The bottom row reports the analogous effects on nominal value-added shares.

The policy-specific experiments reinforce these findings. In the baseline economy, GATT-induced trade integration reduces the employment and value-added shares of agriculture while increasing those of manufacturing and services. In both the *Mexico-symmetric* and *Canada-level Mexico* environments, by contrast, GATT reduces the shares of both agriculture and manufacturing while increasing the services share. The contraction in manufacturing is particularly pronounced in the *Canada-level Mexico* environment.[12]

The NAFTA counterfactual is a particularly interesting experiment for this study because this agreement was signed between Mexico and its two main trading partners, which are developed countries. In 2018, the model-implied effects of NAFTA on Mexico's nominal value-added shares in the baseline environment are −0.86, +5.42, and −4.56 percentage points for agriculture, manufacturing, and services, respectively. When the United States and Canada are instead assigned Mexico-level development characteristics, the corresponding effects are +1.16, +2.50, and −3.66 percentage points. Thus, in the baseline environment, NAFTA generates a substan-

[12]Figures A.6–A.11 plot the integration, GATT, and NAFTA effects over the full sample.

Table 4: Mexico: Trade-Cost Effects by Partner Development

			Emp.-share effect (pp)			VA-share effect (pp)		
Environment	Shock	Year	Agr.	Mfg.	Svc.	Agr.	Mfg.	Svc.
Baseline	No integration	2010	0.38	5.61	-6.00	0.01	7.71	-7.72
Baseline	No integration	2018	0.03	9.60	-9.64	-0.10	12.11	-12.01
Baseline	No GATT	2010	-3.55	0.71	2.84	-1.06	0.04	1.02
Baseline	No GATT	2018	-5.22	2.21	3.02	-1.80	1.49	0.32
Baseline	No NAFTA	2010	-3.14	3.44	-0.30	-1.00	3.94	-2.94
Baseline	No NAFTA	2018	-2.42	4.76	-2.34	-0.86	5.42	-4.56
Mexico-symmetric	No integration	2010	5.62	-1.06	-4.56	1.84	-0.48	-1.37
Mexico-symmetric	No integration	2018	6.90	1.31	-8.21	2.57	2.83	-5.40
Mexico-symmetric	No GATT	2010	-2.91	-5.19	8.10	-0.82	-8.43	9.25
Mexico-symmetric	No GATT	2018	-4.46	-4.64	9.10	-1.71	-7.50	9.21
Mexico-symmetric	No NAFTA	2010	-1.14	1.01	0.14	-0.43	1.32	-0.89
Mexico-symmetric	No NAFTA	2018	3.08	1.45	-4.52	1.16	2.50	-3.66
Canada-level Mexico	No integration	2010	-2.02	-8.23	10.26	-1.30	-11.40	12.70
Canada-level Mexico	No integration	2018	-1.08	-6.56	7.65	-0.91	-8.76	9.66
Canada-level Mexico	No GATT	2010	-3.78	-11.51	15.29	-2.49	-15.73	18.21
Canada-level Mexico	No GATT	2018	-1.95	-8.59	10.54	-1.69	-11.34	13.03
Canada-level Mexico	No NAFTA	2010	-0.57	1.21	-0.64	-0.48	1.74	-1.26
Canada-level Mexico	No NAFTA	2018	-0.24	1.73	-1.49	-0.28	2.41	-2.12

Notes: Each effect is the active observed trade-cost path minus the corresponding frozen-path counterfactual. Positive values mean that the trade-cost change raises the indicated sector share. *Mexico-symmetric* assigns Mexico-level initial productivity and other development characteristics to the United States and Canada, while preserving their productivity-growth paths. *Canada-level Mexico* reports the Mexico-position economy after replacing Mexico's initial development level with Canada's, while keeping Mexico's baseline partners, productivity-growth path, and trade-cost paths. Results use annual calibrated primitives.

tial expansion of manufacturing value added, accompanied by declines in both agriculture and services.

In the *Mexico-symmetric* environment, the manufacturing expansion is smaller and the agricultural effect changes sign. The employment-share effects display the same type of dependence on partner development: NAFTA raises manufacturing by 4.76 points in the baseline but by only 1.45 points with same-level partners. Therefore, the development gap between Mexico and its North American partners amplifies the manufacturing expansion generated by NAFTA and changes the agricultural incidence of the shock. These results provide further evidence that development characteristics shape not only the magnitude of the structural response to trade integration but also, in the case of GATT, the direction of sectoral reallocation.

Canada-level Mexico exhibits a markedly different pattern from both baseline and the *Mexico-symmetric* environment. In 2018, the effect of NAFTA on employment shares is −0.24 percentage points in agriculture, +1.73 in manufacturing, and −1.49 in services. The corresponding effects on nominal value-added shares are −0.28, +2.41, and −2.12 percentage points. Thus, when Mexico is assigned Canada's development characteristics, NAFTA continues to shift economic activity toward manufacturing, but the magnitude of this effect is much smaller than in the baseline environment.

Two features of the observed 1994–2018 window are worth flagging when interpreting these magnitudes. First, NAFTA's tariff schedule was phased in gradually, with most tariff lines eliminated over five to fifteen years rather than immediately in 1994; because the no-NAFTA counterfactual freezes trade costs at their 1993 level all the way through 2018, the reported NAFTA effect captures the full post-1994 cumulative trade-cost decline, which also reflects forces unrelated to the agreement itself, including the expansion of global value chains following China's 2001 WTO accession and the 2008–2009 global financial crisis. Second, NAFTA's implementation date coincides closely with the December 1994 Mexican peso crisis, a large macroeconomic shock to Mexican wages, prices, and trade flows in exactly the years used to identify the NAFTA effect. Because sectoral wage wedges, productivity, and trade costs are all recovered from the data year by year, the NAFTA magnitudes reported here should accordingly be interpreted as the total change associated with the observed post-1993 trade-cost path, rather than as an estimate that isolates the treaty's provisions net of its own phase-in schedule or the concurrent macroeconomic crisis.

It is worth noting that, as shown in Figure A.10, which reports the effect of NAFTA over the entire period following its implementation in 1994, the policy effect is particularly substantial between 1994 and 2000. Moreover, the post-2000 trajectory appears to continue the pattern observed before 2000. This continuity suggests that, despite the coexistence of other shocks, the estimated effect is driven primarily by changes in trade costs rather than by other contemporaneous shocks.

The contrasting sectoral responses across the baseline and *Mexico-symmetric* environments can be understood through differences in comparative advantage between Mexico and its trading partners. In the baseline economy, the productivity gap between Mexico and the United States is larger in agriculture than in manufacturing. At the same time, production costs, particularly wages, are lower in Mexican manufacturing than in U.S. manufacturing. Together, these differences give Mexico a stronger comparative advantage in manufacturing and a weaker comparative advantage in agriculture. Trade integration therefore allows Mexico to source a larger share of agricultural goods from the United States while allocating more workers to manufacturing production, including goods destined for the U.S. market. In the *Mexico-symmetric* environment, these cross-country differences in productivity and production costs are substantially reduced. Mexico consequently benefits less from access to relatively cheaper U.S. agricultural goods, while its comparative advantage in manufacturing weakens. Relative to the baseline economy, Mexico must therefore allocate more workers to domestic agricultural production and fewer workers to manufacturing as foreign demand for Mexican manufactured goods declines.

Figure 10 illustrates this mechanism by reporting the difference between the baseline and *Mexico-symmetric* effects for the main trade-share and destination-expenditure, which are the determinant of sectoral value added and employment as illustrated in condition $S4$. Positive values indicate a larger trade-integration effect in the baseline economy. In 2018, the baseline minus *Mexico-symmetric* gap is +1.97 percentage points for the U.S. sourcing share from Mexico and +2.00 percentage points for Mexico's domestic sourcing share, implying a smaller decline in the latter under the baseline. The corresponding gap in manufacturing expenditure is +10.26 log points for Mexico and −0.53 log points for the United States. Through the equilibrium mapping in condition $S4$, these changes in trade shares interact with destination expenditure and competition from other suppliers in the U.S. market to determine demand for Mexican manufacturing production. Partner development therefore shapes how a given reduction in trade costs translates into trade flows and, ultimately, sectoral labor reallocation in Mexico.

5.4 Partner Size versus Partner Development

The symmetric-partner experiments above hold U.S. and Canadian labor endowments fixed at their observed levels while replacing their development bundles. A natural complementary question is how much of Mexico's structural change response to trade policy reflects the size of its trading partners, rather than differences in their development characteristics, such as productivity, wages, and expenditure patterns. To isolate this channel, I conduct an additional experiment in which I replace only the U.S. and Canadian labor endowments with Mexico's observed labor-endowment path, while holding their productivity, wage wedges, manufacturing wages, preference weights, trade imbalances, and bilateral trade costs at their baseline values. I then repeat the no-GATT and no-NAFTA counterfactuals in this symmetric population size environment.

Table 5 reports the results, including the broad Mexico-integration effect together with the GATT and NAFTA effects. Partner size matters quantitatively. In 2018 the effect on employment shares of trade integration in the baseline framework are +0.03, +9.60, and −9.64 percentage points for agriculture, manufacturing, and services, respectively. When U.S. and Canadian labor endowments are set equal to Mexico's, the corresponding effects are +0.11, +6.85, and −6.96 points, which is approximately 70 percent of the effect obtained in the baseline model for manufacturing and services, leaving 30 percent of the result to be explained by market size. The NAFTA manufacturing effect similarly falls from +4.76 to +2.80 percentage points, while the GATT manufacturing effect changes from +2.21 to −0.11 points. These comparisons show that partner market size is distinct from partner development and affects both the magnitude and, in some cases, the sectoral composition of trade-induced structural change.

Taken together, the counterfactual results show that Mexico's structural response to trade integration cannot be summarized by the observed decline in trade costs alone. The same trade-cost paths generate different sectoral reallocations when the development characteristics of Mexico's partners are changed, and the effects are largest when the counterfactual changes Mexico's exposure to the advanced U.S. market. The *Canada-level Mexico* exercise shows that Mexico's own development bundle is also decisive: a developed Mexico facing Mexico's observed partners would be much more service intensive and would respond differently to the same trade-cost paths. The partner-size experiment shows that development and market size are distinct but interacting margins. These results motivate the discussion below, which interprets the economic mechanism and situates the findings within the broader literature on trade and structural change.

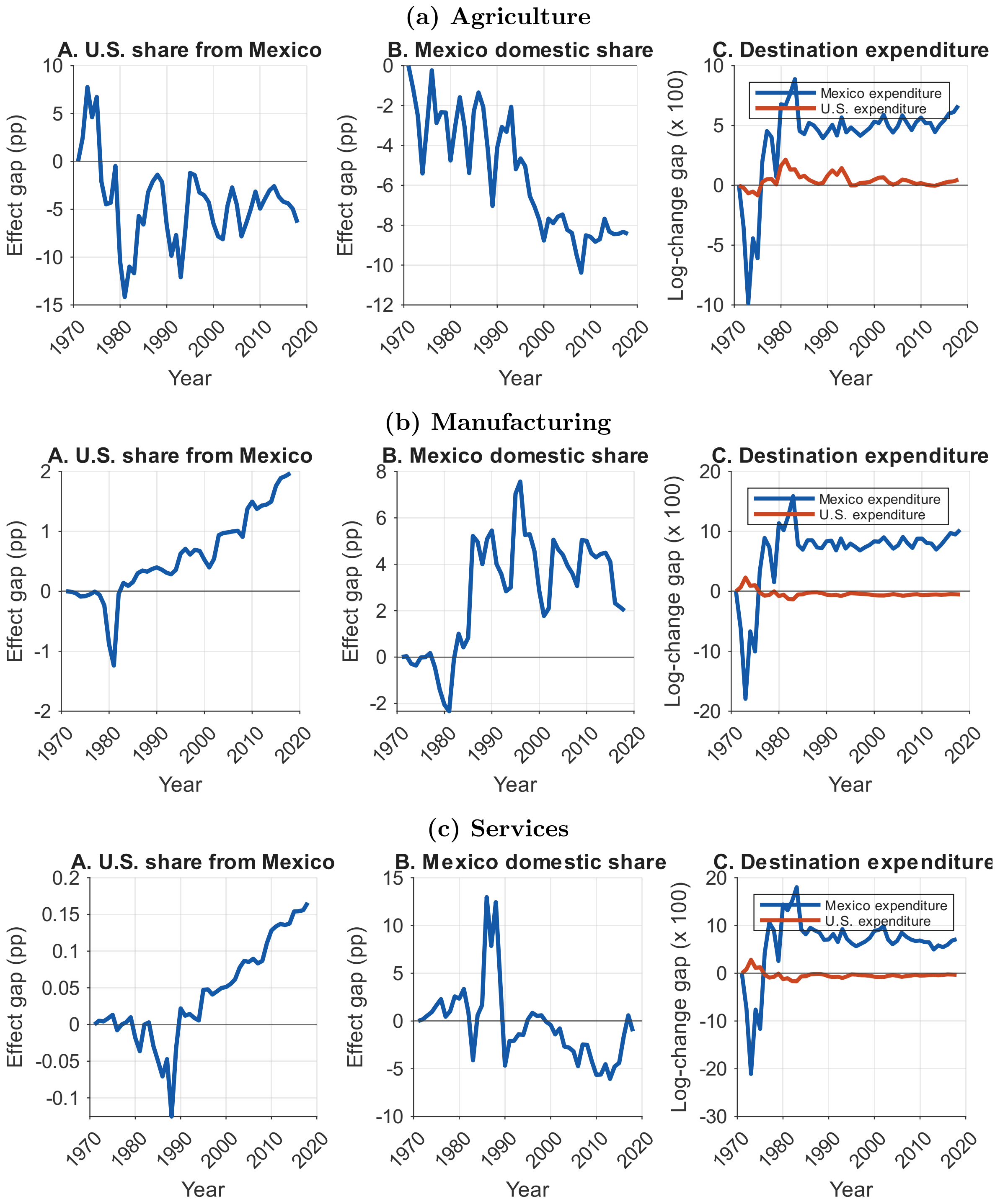


Figure 10: Gaps in Mexico's Broad Trade-Integration Effect on the U.S.–Mexico Margin

Notes: The figure plots the baseline effect minus the *Mexico-symmetric* effect for Mexico's broad trade-integration path. The upper graph reports agriculture, the middle reports manufacturing and and the lower graph reports services. The active path is the observed trade-cost path, and the counterfactual path freezes bilateral trade costs involving Mexico at 1971 levels from 1972 onward. Panels A and B report gaps in percentage-point trade-share effects. Panel C reports gaps in 100 times log-change effects for destination expenditure.

Table 5: Mexico: Integration, GATT, and NAFTA Effects by Development and Partner Size, Effect in 2018

		Emp.-share effect (pp)			VA-share effect (pp)		
Shock	Environment	Agr.	Mfg.	Svc.	Agr.	Mfg.	Svc.
Mexico integration	Baseline	0.03	9.60	-9.64	-0.10	12.11	-12.01
Mexico integration	Mexico-symmetric	6.90	1.31	-8.21	2.57	2.83	-5.40
Mexico integration	Canada-level Mexico	-1.08	-6.56	7.65	-0.91	-8.76	9.66
Mexico integration	U.S./Canada population = Mexico	0.11	6.85	-6.96	-0.04	8.72	-8.68
GATT	Baseline	-5.22	2.21	3.02	-1.80	1.49	0.32
GATT	Mexico-symmetric	-4.46	-4.64	9.10	-1.71	-7.50	9.21
GATT	Canada-level Mexico	-1.95	-8.59	10.54	-1.69	-11.34	13.03
GATT	U.S./Canada population = Mexico	-4.81	-0.11	4.92	-1.63	-1.26	2.89
NAFTA	Baseline	-2.42	4.76	-2.34	-0.86	5.42	-4.56
NAFTA	Mexico-symmetric	3.08	1.45	-4.52	1.16	2.50	-3.66
NAFTA	Canada-level Mexico	-0.24	1.73	-1.49	-0.28	2.41	-2.12
NAFTA	U.S./Canada population = Mexico	-1.80	2.80	-1.00	-0.64	3.15	-2.52

Notes: Each effect is the active observed trade-cost path minus the corresponding frozen-path counterfactual in 2018; positive values mean that the observed trade-cost change raises the sector share. The table compares the baseline, *Mexico-symmetric*, *Canada-level Mexico*, and population-symmetric environments. The population-symmetric environment replaces only U.S. and Canadian labor endowments with Mexico's observed path, holding their development characteristics, productivity-growth paths, and trade-cost paths fixed. Results use annual calibrated primitives.

6 Discussion

The counterfactual experiments deliver one central message: the consequences of trade integration on structural change depend on the development characteristics of the economies to which trade costs fall. In the Mexican case, holding trade-cost paths, partner market size, input–output linkages, imbalances, geography, and each target country's sectoral productivity-growth path fixed, replacing the United States and Canada with Mexico-level partners produces materially different employment and nominal value-added allocations. The same trade-cost paths therefore do not generate a universal sectoral response. Their effects are conditioned by partner productivity levels, wage wedges, manufacturing-wage paths, and expenditure patterns.

The mechanism follows directly from Equation (23). A reduction in trade costs affects sectoral employment through bilateral trade shares, but also through the sectoral composition and size of partner expenditure. With nonhomothetic preferences, expenditure patterns vary systematically with development; with cross-country productivity-level differences, the same trade-cost reduction changes comparative advantage and relative prices differently across partner configurations. Mexico's observed integration therefore connected domestic producers to the demand structure and productive capabilities of substantially more advanced economies, especially the United States. The partner-source decomposition confirms that the U.S. link accounts for most of the advanced-partner effect.

The sectoral mechanism figures qualify this interpretation in an important way. The advanced-partner channel is strongest on the U.S.-absorption margin in manufacturing, where integration generate larger baseline sourcing responses from Mexico. Agriculture instead displays negative U.S.-sourcing gaps, implying that the difference between observed advanced partners and same development level partners does not simply scale all export channels in the same direction. Services exhibit comparatively small U.S.-sourcing gaps, with larger differences appearing in domestic sourcing and Mexico's own destination expenditure. Thus, partner development affects structural change through sector-specific combinations of foreign absorption, domestic sourcing, and expenditure reallocation, rather than through a single aggregate trade-demand channel. These results show that what matters is not only the income gap between trading partners, but also the structure of their comparative advantage. Trade integration with partners at similar levels of development can generate different sectoral effects depending on their patterns of comparative advantage. Integration may favor a given sector when the partner's comparative advantage is relatively weak in that sector, while adversely affecting the same sector when the partner has a stronger comparative advantage

The *Canada-level Mexico* exercise sharpens the interpretation. In that experiment, Mexico receives Canada's initial productivity levels and other development characteristics but keeps Mexico's country position, partners, trade-cost paths, and sectoral productivity-growth rates. The result is not a small perturbation around actual Mexico: the counterfactual economy is much more service intensive and less manufacturing intensive. This comparison clarifies that Mexico's observed structural response reflects two margins at once: integration with advanced partners and Mexico's own middle-income development profile. A developed counterpart facing the same external environment would transmit the same trade-cost changes through a different sectoral structure.[13]

The partner-size experiment provides a complementary qualification. Development and size are distinct margins. Partner development determines the sectoral composition of foreign demand and relative costs, while partner size determines the weight of that demand in the home country's allocation. Replacing U.S. and Canadian labor endowments to Mexico's path changes the magnitude and, in some cases, the sectoral pattern of the effects of trade-cost shocks. Quantitative assessments of trade and structural change should therefore separate the trade-cost shock itself from both the development level and the market size of the partners to which integration provides access.

Relative to existing quantitative work on trade and structural change, the contribution is not that trade costs matter in isolation, but that their sectoral incidence is partner-specific. The Mexican experience shows that a trade integration with an advanced economy exposes a developing country to a particular configuration of foreign demand, intermediate-input costs, productivity levels, and relative prices. These forces interact with domestic comparative advantage and nonhomothetic demand and asymmetric productivity growth across sectors to shape structural change.

7 Conclusion

This paper studies how the development level of trading partners shapes the effects of international trade on structural change, using Mexico's integration with the United States and Canada as a quantitative application. I develop a multi-country, multi-sector general equilibrium model with nonhomothetic preferences, sectoral productivity differences, and input–output linkages, and discipline it using data for Mexico, Canada, the United States, and the rest of the world over 1971–2018. Counterfactual experiments distinguish three forces underlying Mexico's structural response to trade integration: changes in trade costs, differences in development levels across trading partners, and partner market size.

The results show that the effects of trade integration on structural change depend importantly on the development characteristics of the economies it connects. Mexico's integration with the more advanced United States and Canada shifts employment away from agriculture and toward manufacturing relative to an environment in which its partners share Mexico's de-

[13]This exercise is best interpreted as an accounting decomposition rather than a literal alternative history. Because Mexico's own input–output coefficients and intermediate-input intensities, which themselves differ systematically by development level in the data (Table 2), are held fixed, *Canada-level Mexico* combines Canada's productivity, wage, and expenditure characteristics with Mexico's own production network. The resulting economy is a diagnostic device for isolating the development-bundle channel from Mexico's other characteristics, not a claim about what Mexico's production structure would actually look like at Canada's income level.

velopment characteristics, with the United States accounting for most of this effect. Partner development also changes the sectoral effects of specific trade liberalization episodes, affecting not only the magnitude of reallocation but, in some cases, its direction. Complementary experiments show that assigning Mexico the development characteristics of an advanced economy generates a substantially more service-intensive structural path, while partner market size independently affects the magnitude of the response to trade integration, particularly in manufacturing.

These findings imply that the effects of trade integration on structural change cannot be separated from the characteristics of the economies being integrated. Sectoral foreign demand, relative productivity, production costs, and partner market size determine how lower trade costs translate into sectoral reallocation. The development level of trading partners should therefore be viewed as an integral component of the transmission of trade integration to structural change, particularly for developing and middle-income economies integrating with substantially more advanced markets. Future work could incorporate dynamic labor mobility, firm heterogeneity, and distributional effects to study the transition and welfare consequences of partner-specific trade integration.

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A Construction of the Counterfactual Experiments

This appendix describes how every counterfactual is constructed from the calibrated baseline economy. The design has three layers. First, development-bundle experiments replace initial productivity levels and other development characteristics of Mexico's North American partners, or replace Mexico's own initial development profile with Canada's while keeping Mexico's country position and productivity-growth path fixed. Second, trade-integration experiments freeze selected bilateral trade-cost paths at pre-policy values. Third, robustness exercises vary either partner population or the high-frequency movements in calibrated primitives. This structure separates development characteristics, partner size, and trade-cost changes while preserving the same general-equilibrium mapping in every scenario.

A.1 Calibrated baseline objects

Countries are ordered as Mexico, Canada, the United States, and the rest of the world (ROW), and sectors are agriculture, manufacturing, and services. For each year t, the exogenous baseline environment is

$$\mathcal{E}_t^B = \{T_{ik,t},\ \tau_{kdo,t},\ L_{i,t},\ \phi_{i,t},\ \xi_{ik,t},\ \bar{w}_{im,t}\}\,, \tag{A.1}$$

where $T_{ik,t}$ is fundamental sectoral technology, $\tau_{kdo,t}$ is the cost of shipping sector-k goods from origin o to destination d, $L_{i,t}$ is the labor endowment, $\phi_{i,t}$ governs the trade imbalance, $\xi_{ik,t}$ is the sectoral wage wedge, and $\bar{w}_{im,t}$ is the calibrated manufacturing-wage path. Domestic trade costs satisfy $\tau_{kii,t} = 1$.

The non-reassigned time-invariant structural objects are

$$\Theta^0 = \{\theta, \eta, \sigma, \varepsilon, \lambda, \gamma\}.$$

The trade and substitution elasticities, nonhomothetic demand parameters, intermediate-input shares, and input-output composition are never reassigned across countries. Country-specific preference weights, denoted by $\Omega^B = \{\omega_i\}_{i=1}^4$, are also time invariant, but they are treated separately because they are calibrated to match each country's initial expenditure shares. They are held fixed within a given environment and are copied across countries only in the partner-development experiments. The baseline equilibrium is obtained by solving the model separately in every year using $(\mathcal{E}_t^B, \Theta^0, \Omega^B)$.

Let $L^*_{ik,t}(\mathcal{E})$ denote equilibrium sectoral employment under environment $\mathcal{E}$. The reported employment share is

$$s^L_{ik,t}(\mathcal{E}) = \frac{L^*_{ik,t}(\mathcal{E})}{L_{i,t}}. \tag{A.2}$$

Because nominal value added equals the sectoral labor bill in the model, the corresponding value-added share is

$$s^{VA}_{ik,t}(\mathcal{E}) = \frac{\xi_{ik,t}\bar{w}_{im,t}L^*_{ik,t}(\mathcal{E})}{\sum_n \xi_{in,t}\bar{w}_{im,t}L^*_{in,t}(\mathcal{E})}. \tag{A.3}$$

The scenario-specific wage wedges and manufacturing-wage paths are used in Equation (A.3).

A.2 The partner-development replacement

Define the development characteristics used in the replacement as

$$\mathcal{D}_i = \left\{T_{ik,1}, \{\xi_{ik,t}\}_{t=1}^T, \{\bar{w}_{im,t}\}_{t=1}^T, \omega_{ik}\right\}_{k\in\{a,m,s\}}. \tag{A.4}$$

The counterfactual changes the initial productivity level associated with development while preserving the target country's own sector-specific productivity-growth path and, therefore, its Baumol effect. Preference weights are included because the calibration chooses them to match initial expenditure shares, and those expenditure shares are part of the empirical development profile. The bundle $\mathcal{D}_i$ does not contain the country's labor endowment, trade imbalance, input-output coefficients, or trade costs. Thus, a same-level partner is not a copy of Mexico in all dimensions; it is a partner with Mexico-level initial productivity, labor-cost structure, wage path, and expenditure weights operating inside its own market-size, trade-imbalance, production-network, trade-cost, and productivity-growth environment.

For the *Mexico-symmetric* experiment, the United States and Canada receive Mexico's initial productivity levels, wage wedges, manufacturing-wage path, and preference weights, while preserving their own productivity-growth rates:

$$\mathcal{D}_i^M = \begin{cases} \mathcal{D}_{\text{MEX}}, & i \in \{\text{CAN}, \text{USA}\}, \\ \mathcal{D}_i, & i \in \{\text{MEX}, \text{ROW}\}. \end{cases} \tag{A.5}$$

All other objects retain their baseline country identities. In particular, Canada and the United States retain their observed $L_{i,t}$, $\phi_{i,t}$, λ_i, γ_i, bilateral $\tau_{kdo,t}$, and productivity-growth paths. Hence, they keep their market size, production network, geography, trade-policy exposure, and Baumol effect while operating with Mexico-level development characteristics.

For the *Canada-level Mexico* experiment, Mexico receives Canada's initial productivity levels, wage wedges, manufacturing-wage path, and preference weights, while preserving Mexico's own productivity-growth rates:

$$\mathcal{D}_i^C = \begin{cases} \mathcal{D}_{\text{CAN}}, & i = \text{MEX}, \\ \mathcal{D}_i, & i \in \{\text{CAN}, \text{USA}, \text{ROW}\}. \end{cases} \tag{A.6}$$

This environment is reported for Mexico, not for actual Canada. Mexico keeps its baseline labor endowment, trade imbalance, input-output coefficients, geography, partners, trade-cost paths, and productivity-growth path, but it operates with Canada's development bundle. The comparison therefore asks what would have happened to the Mexico-position economy if Mexico started from a Canada-level development profile.

A.3 The partner-population replacement

The partner-development replacement keeps the U.S. and Canadian labor endowments at their observed levels. To isolate the partner-size channel, I construct a separate environment $\mathcal{E}^P$ in which only the U.S. and Canadian labor endowments are replaced with Mexico's observed path:

$$L_{i,t}^P = \begin{cases} L_{\text{MEX},t}, & i \in \{\text{CAN}, \text{USA}\}, \\ L_{i,t}, & i \in \{\text{MEX}, \text{ROW}\}. \end{cases} \tag{A.7}$$

Technology, wage wedges, manufacturing wages, preference weights, trade imbalances, input-output coefficients, and bilateral trade costs remain at their observed values. The *no-GATT* and *no-NAFTA* freezes are then re-run in this partner-population environment. This exercise changes partner market size without changing partner development, so it should be read as a market-size experiment rather than as a same-development experiment.

A.4 Frozen-trade-cost paths

The trade-cost counterfactuals modify τ while holding every other element of the relevant environment fixed. I consider three frozen paths: Mexico-integration, GATT, and NAFTA. Let $M(d, o)$ be a bilateral mask, r a reference year, and s the first affected year. Define the freeze operator

$$[\mathcal{F}(\tau; r, s, M)]_{kdo,t} = \begin{cases} \tau_{kdo,r}, & t \geq s \text{ and } M(d, o) = 1, \\ \tau_{kdo,t}, & \text{otherwise.} \end{cases} \tag{A.8}$$

Table A.1: Counterfactual Experiment Design

Experiment	Definition
Mexico symmetric partner	Replace U.S. and Canadian initial sectoral productivity levels, wage wedges, manufacturing-wage paths, and preference weights with Mexico's; preserve each partner's own sectoral productivity growth; hold partner size, input-output structure, imbalances, and trade costs fixed.
Canada-level Mexico	Replace Mexico's initial sectoral productivity levels, wage wedges, manufacturing-wage path, and preference weights with Canada's; preserve Mexico's own sectoral productivity growth; keep Mexico's partners, labor endowment, input-output structure, imbalances, geography, and trade-cost paths fixed.
No global trade shock	Freeze every off-diagonal bilateral trade cost at its 1971 value from 1972 onward.
No Mexico integration	Freeze every bilateral trade cost involving Mexico at its 1971 value from 1972 onward.
No GATT	Freeze every bilateral trade cost involving Mexico at its 1985 value from 1986 onward.
No NAFTA	Freeze trade costs among Mexico, Canada, and the United States at their 1993 values from 1994 onward.
Partner-source robustness	Replace only the United States, or only Canada, with a Mexico-level partner.
Population symmetric	Replace U.S. and Canadian labor endowments with Mexico's observed path; hold their productivity, wage wedges, manufacturing wages, preference weights, trade imbalances, and bilateral trade costs fixed.
Smooth-path robustness	Apply HP-filtered trends in logs, with $\lambda = 6.25$, to technology, wage wedges, manufacturing wages, and trade costs; filter trade costs separately within the pre-GATT, GATT-to-NAFTA, and post-NAFTA regimes.

Notes: All rows define counterfactual environments that are solved as full general equilibria. The *No* trade-cost experiments compare the active observed trade-cost path with the corresponding frozen-path environment; positive values in subsequent result tables mean that the observed trade-cost change raises the indicated sector share. The smooth-path exercise filters only exogenous primitives with the HP filter; equilibrium outcomes are recomputed from those primitives and are not filtered ex post.

Domestic costs remain one. Let $\mathcal{N} = \{\text{MEX}, \text{CAN}, \text{USA}\}$. The masks and dates are described in Table A.2.

Table A.2: Exact Construction of the Frozen Trade-Cost Paths

Experiment	Affected bilateral links	Reference r	Start s
No Mexico integration	$d = \text{MEX}$ or $o = \text{MEX}$, with $d \neq o$	1971	1972
No GATT	$d = \text{MEX}$ or $o = \text{MEX}$, with $d \neq o$	1985	1986
No NAFTA	$d, o \in \mathcal{N}$, with $d \neq o$	1993	1994

Notes: The table defines the bilateral masks used to construct each frozen trade-cost path. In every case, only the listed bilateral links are fixed at the reference-year value from the start year onward; all other trade costs continue to follow their calibrated annual paths. Each resulting environment is solved as a new general equilibrium.

A.5 Reported effects and signs

For outcome $q \in \{L, VA\}$, the effect of facing more-developed partners on Mexico is

$$\Delta^{q,\text{partner}}_{\text{MEX},k,t} = 100\left[s^q_{\text{MEX},k,t}(\mathcal{E}^B) - s^q_{\text{MEX},k,t}(\mathcal{E}^M)\right]. \tag{A.9}$$

A positive number means that the observed advanced U.S. and Canadian partners raise Mexico's share in the indicated sector relative to Mexico-level partners. A negative number means they lower it.

For the *Canada-level Mexico* environment, the reported effect is

$$\Delta^{q,\text{CLM}}_{\text{MEX},k,t} = 100\left[s^q_{\text{MEX},k,t}(\mathcal{E}^C) - s^q_{\text{MEX},k,t}(\mathcal{E}^B)\right], \tag{A.10}$$

because $\mathcal{E}^C$ upgrades Mexico from its observed initial development profile to Canada's while retaining Mexico's country position and productivity-growth path. A positive entry means that the Canada-level Mexico economy has a higher sector share than actual Mexico.

Let p denote one of the three trade-cost experiments and $\mathcal{F}_p(\tau)$ its frozen path. Within environment $e \in \{B, M, C\}$, the reported policy-path effect is

$$\Delta^{q,p,e}_{i,k,t} = 100\left[s^q_{i,k,t}(\mathcal{E}^e, \tau) - s^q_{i,k,t}(\mathcal{E}^e, \mathcal{F}_p(\tau))\right]. \tag{A.11}$$

It is therefore the equilibrium with the active calibrated trade-cost path minus the equilibrium with the selected links frozen. The role of development characteristics is assessed by comparing $\Delta^{q,p,B}$ with $\Delta^{q,p,M}$ for actual Mexico and with $\Delta^{q,p,C}$ for *Canada-level Mexico*, always using Mexico as the reported country index. All reported entries are percentage-point changes, not percent changes.

A positive policy effect means that the active trade-cost path raises the focal country's sector share relative to the frozen-path counterfactual. A negative effect means that the active path lowers the sector share. Since the comparison is recomputed in each environment, policy effects with observed partners and same-level partners can differ through prices, income, expenditure composition, input-output demand, and sourcing shares.

B Supplement Results

B.1 Calibrated productivity growth

Table A.3 reports calibrated productivity growth for all countries in the model, and Figure A.1 plots them. I report the implied Frechet productivity index $A_{ik,t} = \gamma(1 - 1/\theta)T^{1/\theta}_{ik,t}$, rather than the Frechet location parameter $T_{ik,t}$ itself. The reason is that $T_{ik,t}$ governs the distribution of variety-level productivity draws, while $A_{ik,t}$ expresses the corresponding average efficiency scale in productivity units. Since the table normalizes each country-sector cell by its 1971 value, the constant $\gamma(1-1/\theta)$ cancels and the reported index satisfies $A_{ik,t}/A_{ik,1971} = (T_{ik,t}/T_{ik,1971})^{1/\theta}$. Productivity growth is sector-biased in every country. Agriculture displays the largest cumulative increase, while manufacturing grows more moderately. Mexico's manufacturing productivity index reaches 1.84 by 2018, compared with 2.51 in Canada and 2.68 in the United States. Services productivity in Mexico rises by a factor of 2.89, below the United States but close to Canada.

Table A.3: Calibrated Productivity Growth Across Countries

	Index, 2018 (1971=1)			Average annual log growth (%)		
Country	Agriculture	Manufacturing	Services	Agriculture	Manufacturing	Services
Mexico	4.51	1.84	2.89	3.21	1.29	2.26
Canada	3.25	2.51	3.15	2.51	1.96	2.44
United States	3.49	2.68	3.49	2.66	2.10	2.66
Rest of World	3.85	2.33	2.48	2.87	1.80	1.93

Notes: The table reports the implied Frechet productivity index $A_{ik,t}$, where $A_{ik,t} = \Gamma(1-1/\theta)T_{ik,t}^{1/\theta}$. The index columns report $A_{ik,2018}/A_{ik,1971}$. Average annual log growth is computed over 1971–2018.

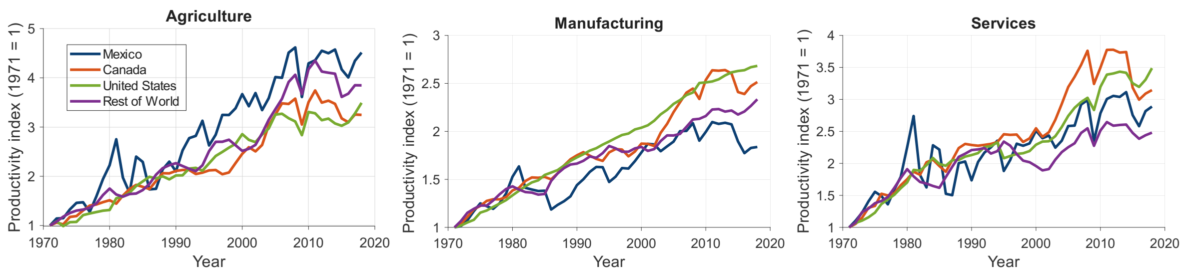

Figure A.1: Development Bundle: Sectoral Productivity Paths

Notes: The panels plot the Frechet productivity index $A_{ik,t}$, normalized to 1971 within each country-sector cell. Lines compare Mexico, Canada, the United States, and the rest of the world.

B.2 Development-Bundle Diagnostics

Figures A.2 and A.3 report the country-level series that enter the development-bundle diagnostics. These diagnostics show that the bundle is not an arbitrary relabeling of countries. Canada and the United States differ from Mexico in productivity levels, productivity growth, sectoral wage wedges, and manufacturing-wage paths. The counterfactual replacement uses these diagnostics asymmetrically: it replaces productivity levels but preserves the target country's productivity-growth path, while wage wedges, manufacturing wages, and preference weights are reassigned as development characteristics. The *Canada-level Mexico* experiment therefore gives Mexico an empirically observed high-income initial development profile while leaving Mexico's market size, geography, trade imbalance, input–output structure, productivity growth, and trade-cost paths unchanged.

B.3 Supplemental Model Fit

The baseline calibration also reproduces the broad sectoral composition of nominal gross output. This diagnostic is useful because gross-output shares combine final demand, intermediate-input

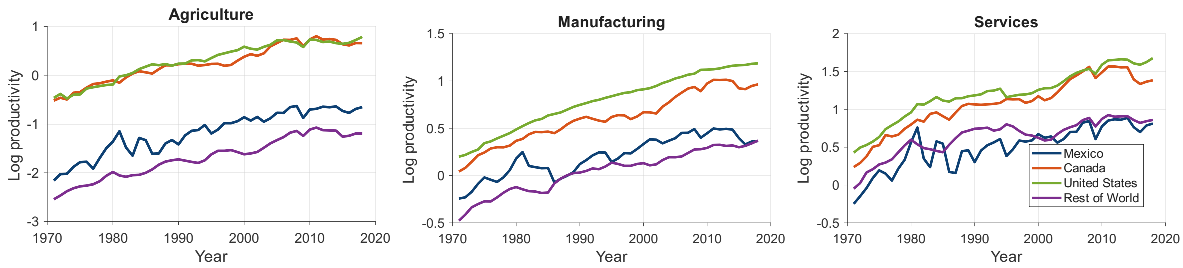

Figure A.2: Development Bundle: Log Productivity Levels

Notes: The panels plot $\log(A_{ik,t})$ separately for agriculture, manufacturing, and services. Each panel contains one line for Mexico, Canada, the United States, and the rest of the world. These paths are not normalized to 1971 and therefore retain cross-country level differences under the model's productivity normalization.

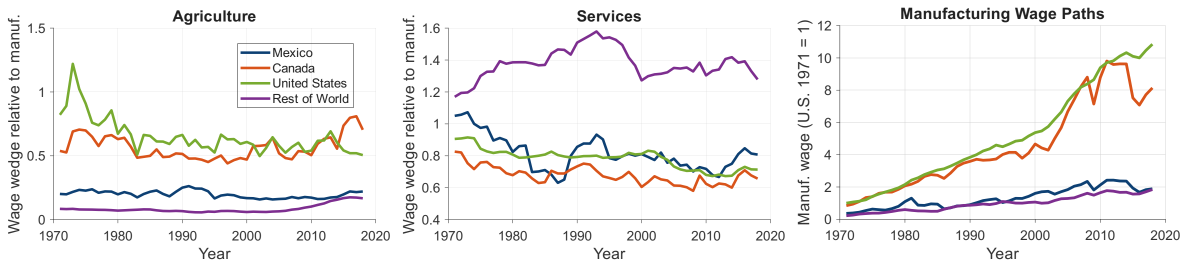

Figure A.3: Development Bundle: Sectoral Wage Wedges and Manufacturing-Wage Paths

Notes: The first two panels plot agriculture and services wage wedges relative to manufacturing. The manufacturing wedge is normalized to one by construction. The last panel plots manufacturing wages under the fixed-base-year U.S. manufacturing-wage numeraire used in the baseline calibration. Lines compare Mexico, Canada, the United States, and the rest of the world.

demand, trade shares, and supplier revenue. They therefore provide a check on the production and input-output side of the model beyond the employment and value-added moments emphasized in the main text. Figure A.4 plots the observed and model-implied paths, and Table A.4 reports the corresponding RMSE and correlation statistics. Across all country-sector cells, the gross-output-share RMSE is 2.86 percentage points and the mean correlation is 0.863.

The supplemental fit is strongest for the broad long-run movements in agriculture and services, and remains informative for manufacturing despite larger annual deviations. This pattern is consistent with the model's role in the paper: it disciplines comparative equilibrium mechanisms rather than absorbing every short-run movement in sectoral production. The gross-output diagnostic therefore provides additional support for the intermediate-input and trade-revenue blocks, which generate plausible sectoral production shares without making those shares separate calibration targets.

B.4 Which Advanced Partner Matters for Mexico?

The partner-source experiment in Table A.5 separates the United States and Canada. In 2018, replacing only the United States with a Mexico-level partner implies an advanced-U.S. effect of −9.26 points in agriculture, +11.15 in manufacturing, and −1.88 in services, accounting for most of the joint effect reported above. The corresponding Canada-only effects are −0.58, +2.24, and −1.66 points. Thus, in the model the United States drives most of Mexico's advanced-partner effect, while the Canadian link contributes comparatively less on its own. The joint effect is not the sum of the separate effects because prices, expenditures, and trade shares adjust in general equilibrium.

Table A.4: Supplemental Fit: Nominal Gross-Output Shares

	RMSE (pp)			Correlation		
Country	Agr.	Mfg.	Svc.	Agr.	Mfg.	Svc.
Mexico	1.04	3.90	3.44	0.961	0.305	0.867
Canada	0.30	2.53	2.71	0.938	0.890	0.925
United States	0.34	4.40	4.70	0.975	0.995	0.995
Rest of World	0.58	2.49	2.82	0.946	0.740	0.820
All countries		2.86			0.863	

Notes: RMSE is the root mean squared error in percentage points between model and data shares over 1971–2018. Observed shares are nominal gross output by sector divided by total nominal gross output in the country-year. Model gross output is measured by supplier revenue, $\sum_j P_{jk,t} Q_{jk,t} \pi_{jik,t}$, which is the model counterpart to nominal gross output.

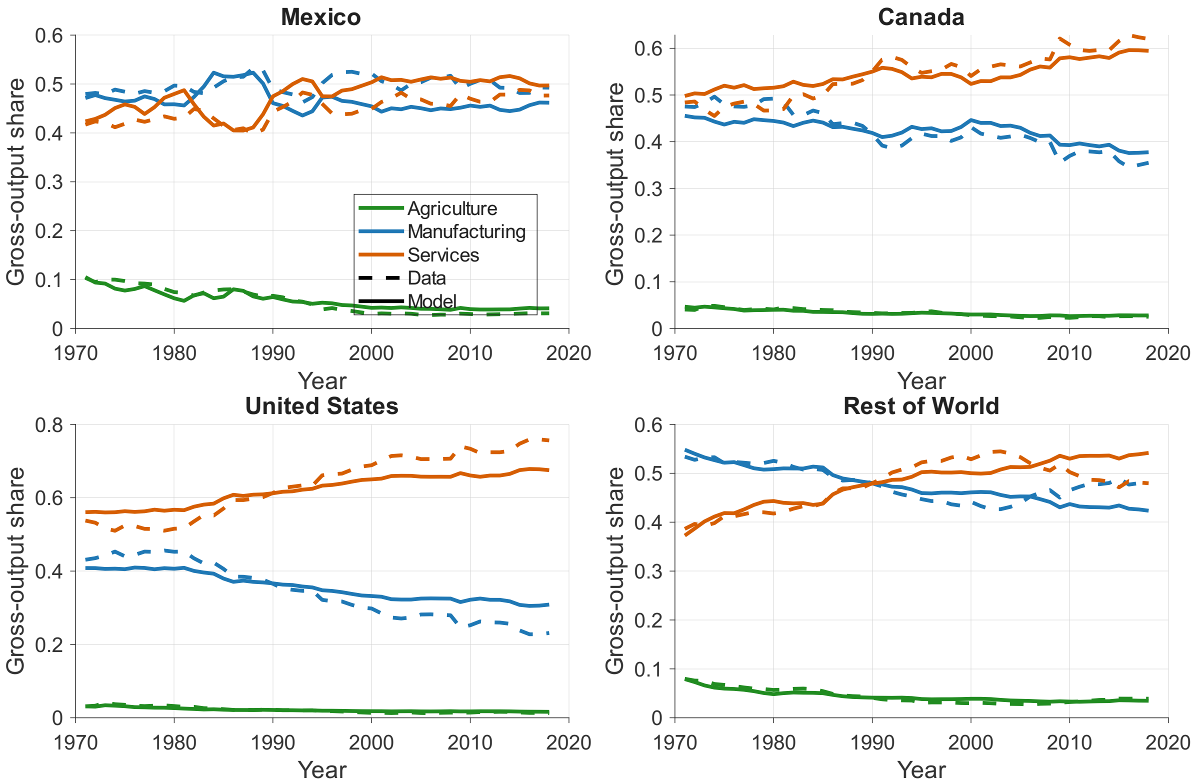

Figure A.4: Supplemental Fit: Sectoral Gross-Output Shares

Notes: The figure plots nominal gross-output shares by sector and country. Dashed lines are observed shares and solid lines are model-implied shares. Model gross output is measured as sectoral supplier revenue, $\sum_j P_{jk,t} Q_{jk,t} \pi_{jik,t}$. Colors identify agriculture, manufacturing, and services.

Table A.5: Mexico: Which Advanced Partner Drives the Development Effect?

		Employment-share effect (pp)			Value-added-share effect (pp)		
Replacement	Year	Agr.	Mfg.	Svc.	Agr.	Mfg.	Svc.
U.S. and Canada	2010	-7.81	7.93	-0.13	-2.63	9.47	-6.84
U.S. and Canada	2018	-10.36	11.76	-1.39	-3.93	13.35	-9.42
U.S. only	2010	-6.79	7.16	-0.37	-2.26	8.50	-6.24
U.S. only	2018	-9.26	11.15	-1.88	-3.48	12.67	-9.19
Canada only	2010	-0.58	1.93	-1.35	-0.20	2.45	-2.24
Canada only	2018	-0.58	2.24	-1.66	-0.21	2.64	-2.42

Notes: Effects are baseline minus the indicated Mexico-level-partner counterfactual. Positive values mean that the actual advanced partner raises Mexico's sector share relative to the Mexico-level-partner environment. The joint effect need not equal the sum of the single-partner effects because prices, expenditures, and trade shares adjust in general equilibrium. Results use annual calibrated primitives.

B.5 Supplementary results: Trade Policy experiments

This subsection reports the full time paths behind the trade-policy and trade-integration effects summarized in the main text. For each development environment, the figures plot employment-share effects in the top row and value-added-share effects in the bottom row. Lighter lines use the annual calibrated primitives, while darker lines report the same counterfactual exercises after HP filtering the exogenous primitives with $\lambda = 6.25$.

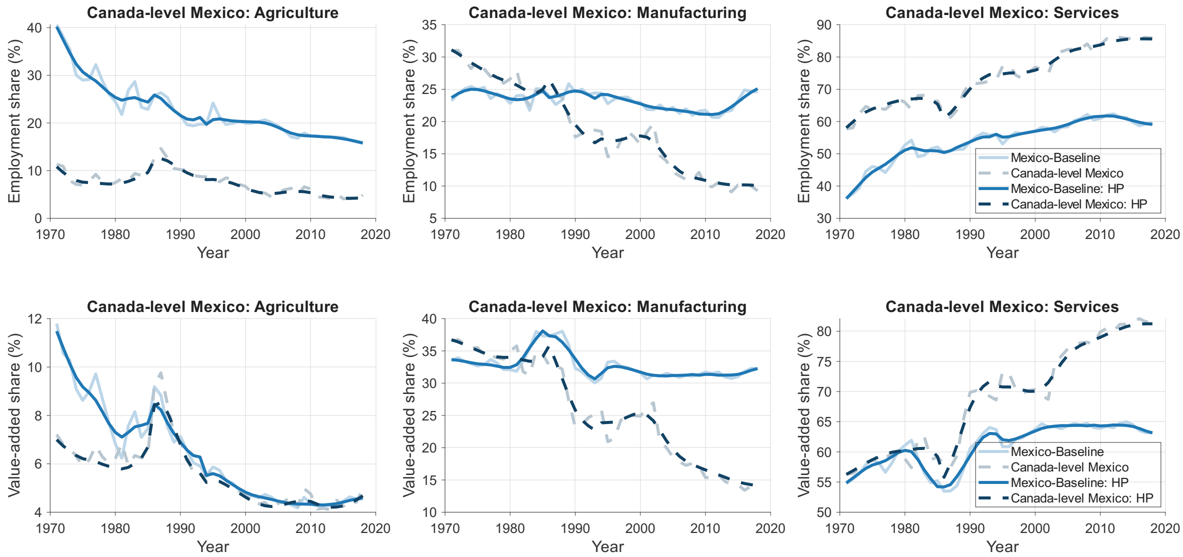

Figure A.5: Structural Change Canada-Level Mexico

Notes: These figures compare actual Mexico with *Canada-level Mexico*, in which Mexico receives Canada's initial productivity levels, wage wedges, manufacturing-wage paths, and preference weights while retaining Mexico's partners, trade-cost paths, and productivity-growth path. Lighter lines use the annual calibrated primitives; darker lines use equilibria recomputed from HP-filtered primitives. The top panels plot sectoral employment shares, while the bottom panels plot value-added shares.

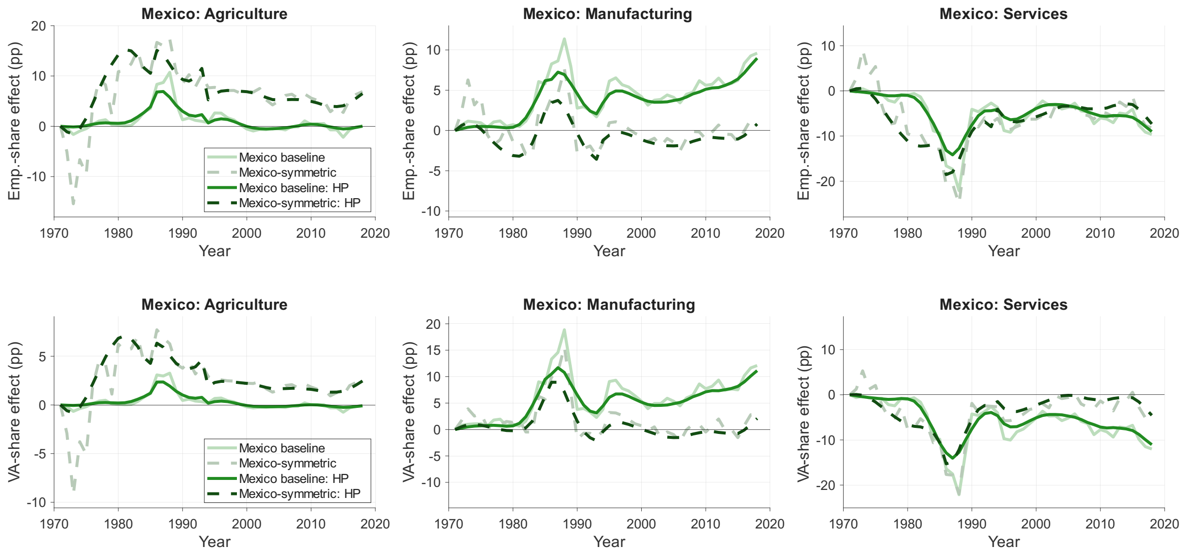

Figure A.6: Mexico-Integration Effects by Development Environment

Notes: The figures plot broad Mexico-integration effects on employment and value-added shares in the baseline and *Mexico-symmetric* environments. The top row shows employment while the bottom row shows value-added shares. Each effect is the active observed trade-cost path minus the no-integration frozen-path counterfactual, which holds bilateral trade costs involving Mexico at their 1971 levels. Solid lines report actual Mexico and dashed lines report the counterfactual development environment; lighter lines use annual calibrated primitives and darker lines use HP-filtered primitive simulations.

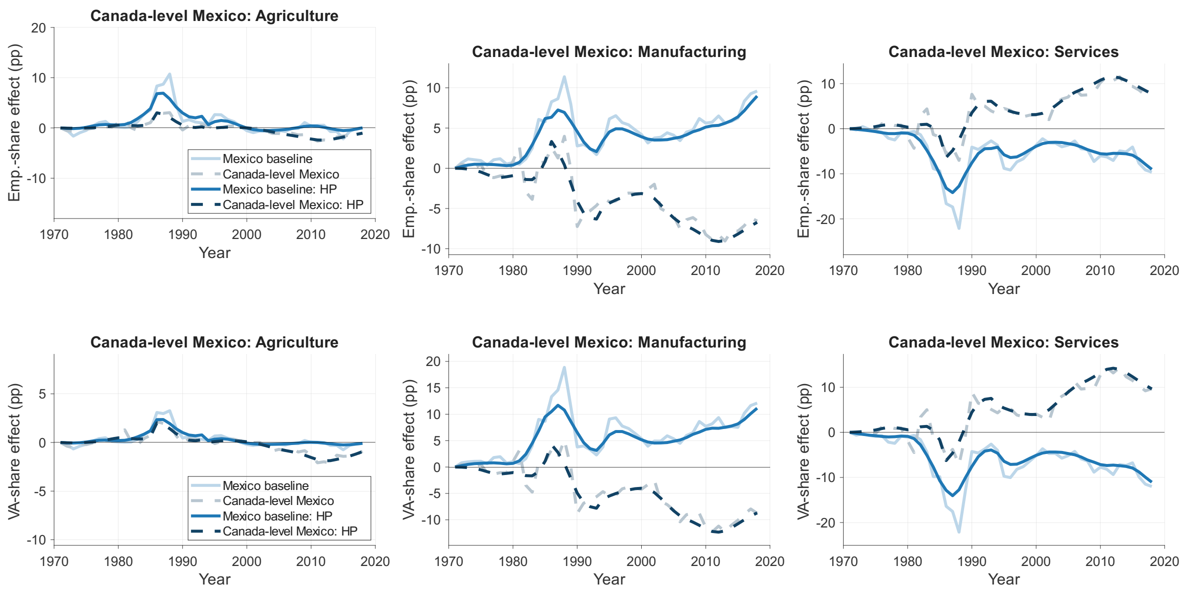

Figure A.7: Mexico-Integration Effects for Canada-Level Mexico

Notes: The figures plot broad Mexico-integration effects on employment and value-added shares in the baseline and *Canada-level Mexico* environments. The top row shows employment while the bottom row shows value-added shares. Each effect is the active observed trade-cost path minus the no-integration frozen-path counterfactual, which holds bilateral trade costs involving Mexico at their 1971 levels. Solid lines report actual Mexico and dashed lines report the counterfactual development environment; lighter lines use annual calibrated primitives and darker lines use HP-filtered primitive simulations.

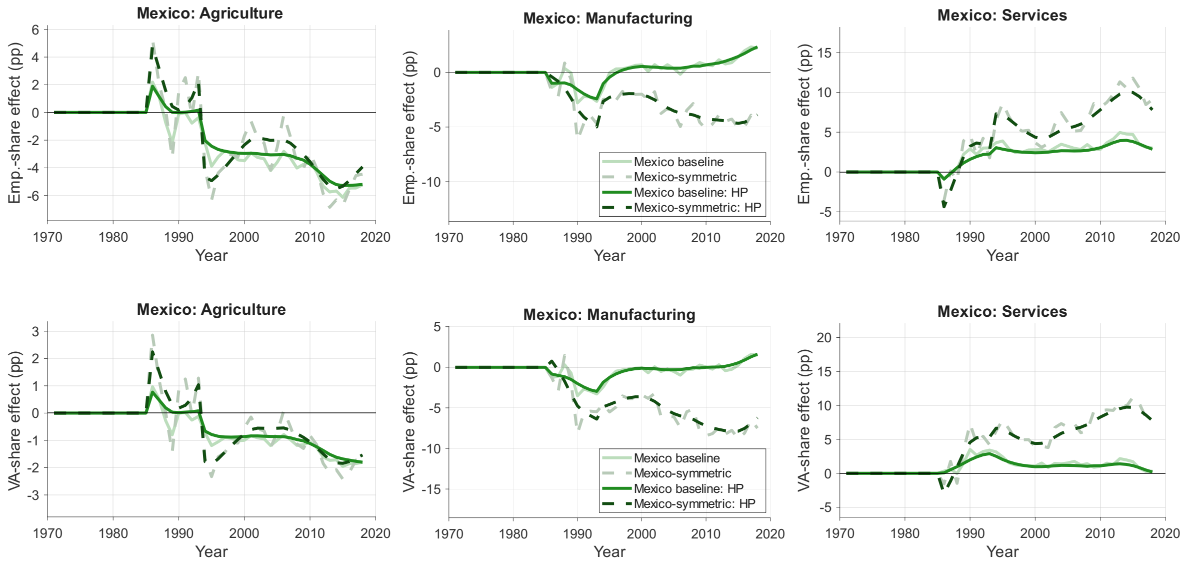

Figure A.8: GATT Effects by Development Environment

Notes: The figures plot GATT effects on employment and value-added shares in the baseline and *Mexico-symmetric*. The top row shows employment, while the bottom row shows value-added shares. Each effect is the active observed post-1986 trade-cost path minus the no-GATT frozen-path counterfactual. Solid lines report actual Mexico and dashed lines report the counterfactual development environment; lighter lines use annual calibrated primitives and darker lines use HP-filtered primitive simulations.

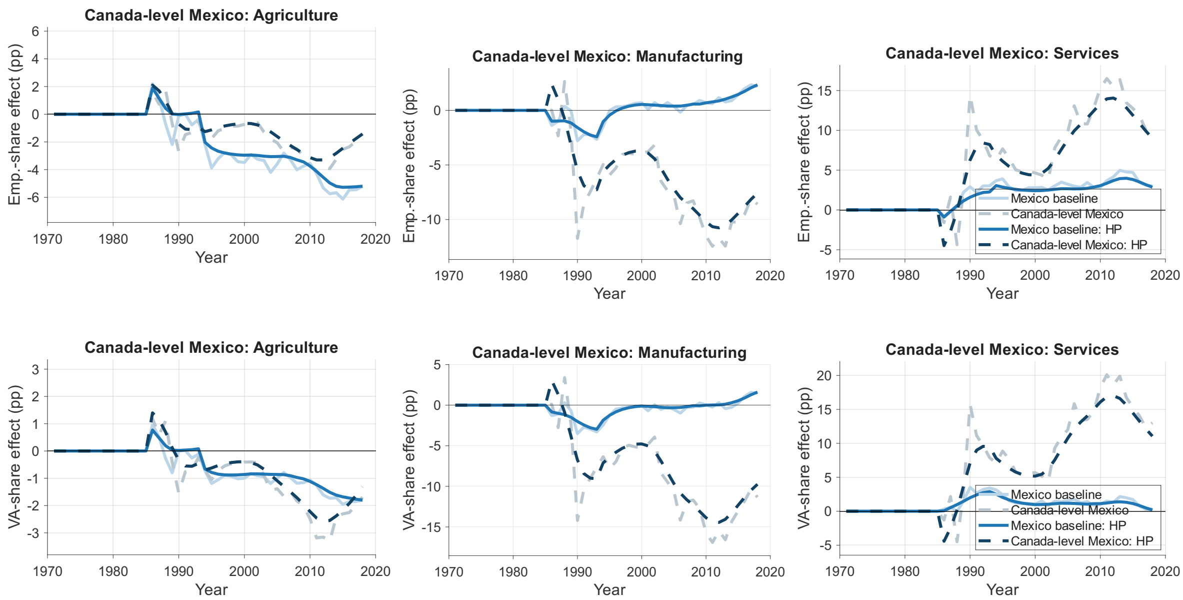

Figure A.9: GATT Effects by Development Environment

Notes: The figures plot GATT effects on employment and value-added shares in the baseline and *Canada-level Mexico*. The top row shows employment, while the bottom row shows value-added shares. Each effect is the active observed post-1986 trade-cost path minus the no-GATT frozen-path counterfactual. Solid lines report actual Mexico and dashed lines report the counterfactual development environment; lighter lines use annual calibrated primitives and darker lines use HP-filtered primitive simulations.

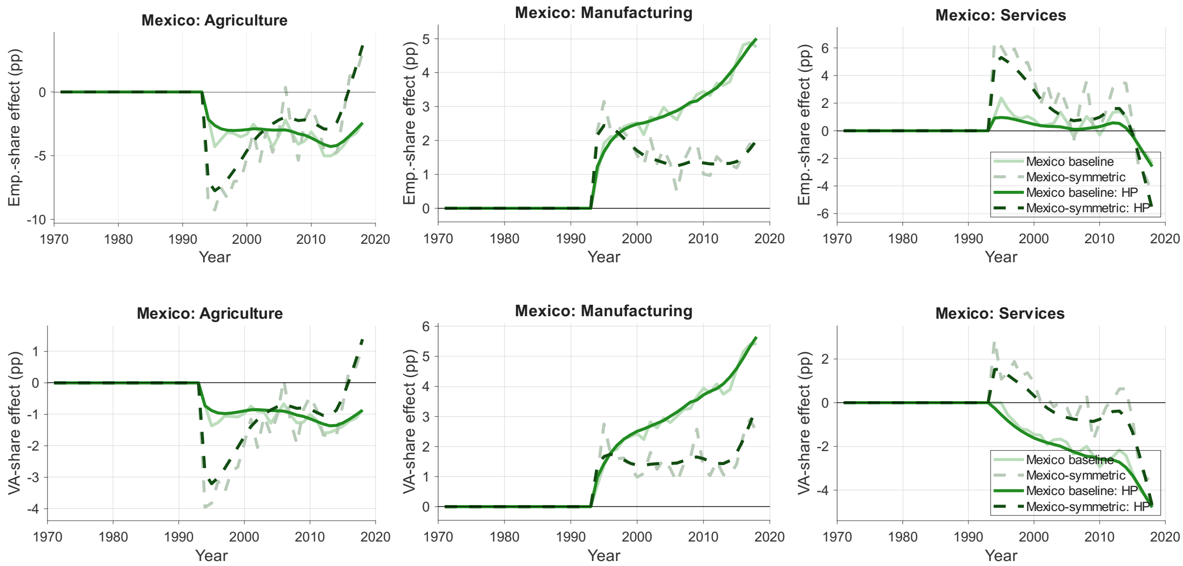

Figure A.10: NAFTA Effects by Development Environment

Notes: The figures plot NAFTA effects on employment and value-added shares in the baseline and *Mexico-symmetric*. The top row shows employment, while the bottom row shows value-added shares. Each effect is the active observed NAFTA-period trade-cost path minus the no-NAFTA frozen-path counterfactual. Solid lines report actual Mexico and dashed lines report the counterfactual development environment; lighter lines use annual calibrated primitives and darker lines use HP-filtered primitive simulations.

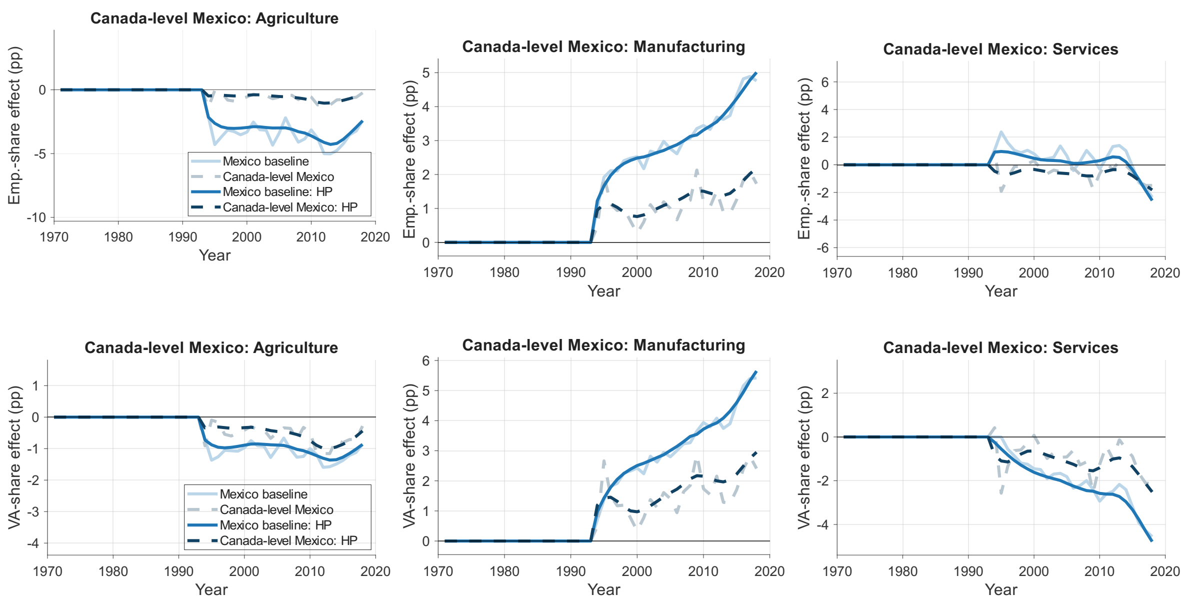

Figure A.11: NAFTA Effects by Development Environment

Notes: The figures plot NAFTA effects on employment and value-added shares in the baseline and *Canada-level Mexico*. The top row shows employment, while the bottom row shows value-added shares. Each effect is the active observed NAFTA-period trade-cost path minus the no-NAFTA frozen-path counterfactual. Solid lines report actual Mexico and dashed lines report the counterfactual development environment; lighter lines use annual calibrated primitives and darker lines use HP-filtered primitive simulations.

B.6 Partner Size and Development Environments

Table A.6 reports the complete 2010 and 2018 entries for the partner-size exercise. The table keeps the same environments as the main-text table: baseline, *Mexico-symmetric*, *Canada-level Mexico*, and population-symmetric. This presentation separates two comparisons. The first compares the baseline with *Mexico-symmetric* and *Canada-level Mexico*, which change development characteristics. The second compares the baseline with the population-symmetric environment, which changes partner size while holding partner development characteristics fixed.

Table A.6: Mexico: Integration, GATT, and NAFTA Effects by Environment, 2010 and 2018

			Emp.-share effect (pp)			VA-share effect (pp)		
Shock	Environment	Year	Agr.	Mfg.	Svc.	Agr.	Mfg.	Svc.
Mexico integration	Baseline	2010	0.38	5.61	-6.00	0.01	7.71	-7.72
Mexico integration	Mexico-symmetric	2010	5.62	-1.06	-4.56	1.84	-0.48	-1.37
Mexico integration	Canada-level Mexico	2010	-2.02	-8.23	10.26	-1.30	-11.40	12.70
Mexico integration	U.S./Canada population = Mexico	2010	0.67	3.47	-4.14	0.13	4.90	-5.03
GATT	Baseline	2010	-3.55	0.71	2.84	-1.06	0.04	1.02
GATT	Mexico-symmetric	2010	-2.91	-5.19	8.10	-0.82	-8.43	9.25
GATT	Canada-level Mexico	2010	-3.78	-11.51	15.29	-2.49	-15.73	18.21
GATT	U.S./Canada population = Mexico	2010	-2.78	-1.08	3.86	-0.80	-2.14	2.95
NAFTA	Baseline	2010	-3.14	3.44	-0.30	-1.00	3.94	-2.94
NAFTA	Mexico-symmetric	2010	-1.14	1.01	0.14	-0.43	1.32	-0.89
NAFTA	Canada-level Mexico	2010	-0.57	1.21	-0.64	-0.48	1.74	-1.26
NAFTA	U.S./Canada population = Mexico	2010	-2.05	1.96	0.10	-0.65	2.23	-1.58
Mexico integration	Baseline	2018	0.03	9.60	-9.64	-0.10	12.11	-12.01
Mexico integration	Mexico-symmetric	2018	6.90	1.31	-8.21	2.57	2.83	-5.40
Mexico integration	Canada-level Mexico	2018	-1.08	-6.56	7.65	-0.91	-8.76	9.66
Mexico integration	U.S./Canada population = Mexico	2018	0.11	6.85	-6.96	-0.04	8.72	-8.68
GATT	Baseline	2018	-5.22	2.21	3.02	-1.80	1.49	0.32
GATT	Mexico-symmetric	2018	-4.46	-4.64	9.10	-1.71	-7.50	9.21
GATT	Canada-level Mexico	2018	-1.95	-8.59	10.54	-1.69	-11.34	13.03
GATT	U.S./Canada population = Mexico	2018	-4.81	-0.11	4.92	-1.63	-1.26	2.89
NAFTA	Baseline	2018	-2.42	4.76	-2.34	-0.86	5.42	-4.56
NAFTA	Mexico-symmetric	2018	3.08	1.45	-4.52	1.16	2.50	-3.66
NAFTA	Canada-level Mexico	2018	-0.24	1.73	-1.49	-0.28	2.41	-2.12
NAFTA	U.S./Canada population = Mexico	2018	-1.80	2.80	-1.00	-0.64	3.15	-2.52

Notes: Each effect is the active observed trade-cost path minus the corresponding no-integration, no-GATT, or no-NAFTA frozen-path counterfactual. The table reports Mexico under the baseline, *Mexico-symmetric*, *Canada-level Mexico*, and population-symmetric environments. The population-symmetric environment changes partner size only. Results use annual calibrated primitives.

C Solve Algorithm

This appendix describes the numerical algorithm implemented to solve the model. The model is solved as a sequence of static annual equilibria. In each year, sectoral wage wedges and manufacturing-wage paths are taken from the calibrated exogenous environment; the algorithm solves for prices, trade shares, expenditure, output, and sectoral labor allocations consistent with those primitives.

1. In period t, take $T_{ik,t}$, $\tau_{ijk,t}$, $L_{i,t}$, $\phi_{i,t}$, $\xi_{ik,t}$, and the manufacturing-wage path as given.

2. Initialize sectoral prices using the calibrated price indexes in the baseline, or the previous/available price vector in counterfactual calls.

3. Iterate on Equations S1 and S2: given prices, compute unit costs $v_{ik,t}$; given unit costs, update sectoral prices $P_{ik,t}$. The price fixed point uses damping and a log-difference tolerance of 10^{-8}.

4. Compute bilateral expenditure shares $\pi_{ijk,t}$ from S3.

5. Initialize country income and iterate on the real side. Given income, compute the global transfer implied by M3, household expenditure satisfying D2, aggregate consumption and the price aggregator in D3, sectoral consumption from D1, and composite-output values from M2.

6. Map destination composite demand into supplier revenues using the trade-share matrix. Sectoral labor demand then follows from S4: value-added supplier revenue divided by the sectoral wage.

7. Normalize sectoral labor allocations within each country to satisfy M1. Update country income from sectoral labor payments and repeat the real-side block until the maximum relative income update is below 10^{-8}, or until the maximum iteration count is reached.

8. Save equilibrium prices, trade shares, consumption, output, sectoral employment, income, expenditure, and revenues for year t, then proceed to year $t + 1$.

D Data Appendix

This appendix documents the construction of the empirical database used in the quantitative analysis. It describes the primary data sources, the harmonization of countries and sectors, the construction of nominal and real aggregates, the aggregation of the rest-of-the-world economy, the treatment of bilateral trade flows and input–output coefficients, and the variables used to discipline preferences, productivity, trade costs, wage wedges, and counterfactual primitives.

D.1 Data Sources and Harmonization

The empirical database combines sectoral national accounts, employment, prices, bilateral trade flows, input-output linkages, population, income, and purchasing-power-parity information for the period 1971–2018. The construction proceeds in two conceptual steps. First, each raw source is harmonized to common country identifiers, annual frequency, and the three-sector classification used in the model. Second, the harmonized sources are combined into a single country-sector panel using source-priority rules that reflect coverage, internal consistency, and proximity to the original statistical agency. Nominal variables are expressed in current U.S. dollars; real variables are benchmarked to 2005 PPP prices.

The main sources are EU KLEMS, the World Input-Output Database, the OECD Inter-Country Input-Output tables, the Groningen Growth and Development Centre (GGDC) 10-Sector Database, the Groningen Productivity Level Database, the U.S. Bureau of Economic Analysis, Statistics Canada, United Nations sectoral value-added data, the World Development Indicators, and the Penn World Table. These sources are used jointly because no single database provides consistent long-run coverage of employment, value added, gross output, intermediate inputs, bilateral trade, and PPP-adjusted real quantities for all countries in the sample.

D.2 Country Sample and Sector Mapping

The model contains four economies: Mexico, Canada, the United States, and a rest-of-the-world aggregate. The rest of the world consists of Australia, Austria, Belgium, Brazil, China, Germany, Denmark, Spain, Finland, France, the United Kingdom, Greece, India, Ireland, Italy, Japan, South Korea, Luxembourg, the Netherlands, Portugal, Sweden, and Taiwan. This country set is chosen to maximize the overlap between long-run sectoral accounts, input-output information, and bilateral trade data.

All observations are mapped into three broad sectors. Agriculture includes agriculture, forestry, and fishing. Manufacturing includes mining, manufacturing, utilities, and construction. Services include all remaining market and non-market activities. The mapping is implemented at the most disaggregated level available in each source, using the relevant ISIC, NACE, WIOD, ICIO, and GGDC classifications before aggregation to the three model sectors.

D.3 National Accounts, Prices, and Real Aggregates

Sectoral employment, nominal value added, real value added, nominal gross output, real gross output, and intermediate inputs are assembled from the harmonized national-account sources. When multiple sources overlap, the preferred source is selected using the following hierarchy. Country-specific statistical agencies are used to fill employment gaps for the United States and Canada. EU KLEMS and WIOD provide the core internationally comparable sectoral accounts for advanced economies. GGDC extends coverage for economies and periods with incomplete EU KLEMS or WIOD coverage. United Nations value-added series fill selected remaining gaps, especially where long historical coverage is otherwise unavailable. Intermediate inputs are measured directly when possible and are otherwise inferred as gross output less value added.

Real sectoral quantities are aggregated using Tornqvist growth rates. Within each country and broad sector, industry expenditure shares are used to weight industry-level real growth rates. The sectoral real level is then recovered by applying the resulting growth rates forward and backward from the relevant source benchmark year. This procedure avoids simple summation of real quantities outside the benchmark year and preserves changes in the relative importance of detailed industries within each broad sector.

Nominal series are converted into U.S. dollars using exchange rates derived from national-currency and U.S.-dollar GDP series in the World Development Indicators, with a separate exchange-rate series for Taiwan. Real value added, real gross output, and real intermediate inputs are benchmarked to 2005 PPP prices using conversion factors constructed from the Groningen Productivity Level Database. The gross-output price index used in the calibration is

$$P_{ik,t}^{GO} = \frac{GO_{ik,t}^{USD}}{GO_{ik,t}^{PPP05}},$$

and an analogous value-added price index is used as a diagnostic series. Missing observations are filled with source-specific growth rates when reliable adjacent observations are available. When no adjacent observation exists, the series is backcast or extended using average annual growth over the nearest reliable window.

D.4 Rest-of-the-World Aggregate

The rest-of-the-world aggregate is formed after country-level series have been expressed in common units. Employment and nominal variables are summed across the countries assigned to the aggregate. Real quantities are constructed from country-sector growth rates using Tornqvist aggregation and 2005 PPP benchmarks. Price indexes for the rest of the world are output-weighted averages within each year and sector, with weights based on U.S.-dollar value added or gross output, depending on the object being aggregated.

D.5 Bilateral Trade and Input-Output Coefficients

Bilateral trade flows are constructed from WIOD and OECD ICIO trade data. Origin and destination industries are mapped into the three model sectors, and all trade involving economies outside Mexico, Canada, and the United States is assigned to the rest-of-the-world aggregate. The resulting object is a set of annual destination-origin trade matrices by sector. For goods sectors, the historical and post-1995 trade series are combined to obtain long-run coverage. For services, bilateral flows are constructed from services imports and exports in the World Development Indicators, with missing values interpolated or backcast using country-specific growth rates. Foreign services imports are allocated across origins using observed services-trade shares, and domestic services absorption is measured as gross output plus imports minus exports.

Because comprehensive bilateral, sector-level services-trade data are unavailable for large stretches of the 1971–2018 sample, a non-trivial share of the services-trade matrix relies on the allocation and interpolation procedures described above rather than on directly reported bilateral flows. This measurement limitation should be kept in mind when interpreting the services-sector counterfactual results in Section 5; I treat the tradable-services specification adopted here as the paper's benchmark modeling choice rather than as an uncontested one.

D.6 Population, Income Gaps, and Calibration Variables

Population and real GDP per capita are taken from the Penn World Table (Feenstra et al. 2016). The income gap used in preference calibration is the 1971 population-weighted real GDP per capita of each model economy relative to Mexico.

D.7 Aggregation Procedure

Employment and all nominal variables are aggregated to the sector level by summation. For real variables, simple summation is exact only in the reference year, when nominal and real values coincide. For all other years, sectoral real quantities are constructed via Tornqvist indexes applied to the reference-year benchmarks. Specifically, for any variable x, let $x_n^j(t)$ denote the real quantity in industry $j \in \{1, \dots, N_n\}$ within sector n at time t, and $X_n(t)$ the sectoral aggregate real value. The growth rate of $X_n(t)$ is:

$$\Delta \log X_n(t) = \sum_{j=1}^{N_n} \bar{s}_n^j(t) \left(\log x_n^j(t) - \log x_n^j(t-1)\right), \tag{A.12}$$

where

$$s_n^j(t) \equiv \frac{p_{x,n}^j(t)\, x_n^j(t)}{\sum_{i=1}^{N_n} p_{x,n}^i(t)\, x_n^i(t)}, \qquad \bar{s}_n^j(t) \equiv \tfrac{1}{2}\left(s_n^j(t) + s_n^j(t-1)\right),$$

with $p_{x,n}^j(t)$ the price index for industry j in sector n. Sectoral level series are then recovered by applying these growth rates to the reference-year benchmark values.