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RESEARCH PAPER

THE GLOBAL IMPACT OF PRESIDENT TRUMP'S RECIPROCAL TARIFFS:

Implications for Developing Countries

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President Donald Trump's "Reciprocal Tariff" policy, announced on April 2, 2025 (dubbed "Liberation Day"), represents one of the most significant shifts in U.S. trade policy in nearly a century. Trump's policy imposes a baseline 10% tariff on all imports and additional country-specific tariffs that range from 10% to 50% for countries designated as having "non-reciprocal trading practices" with the U.S. These specific tariffs are determined based on each country's bilateral trade balance with the U.S. Postponements and bilateral trade negotiations started after April 9, 2025.

This paper develops a two-country general equilibrium model to analyze the economic implications of the originally announced "Reciprocal Tariff" policy, with particular emphasis on developing countries. Initially characterized by a trade deficit in the U.S. and asymmetric tariff structures, the model explores the effects of the U.S. unilaterally raising its tariffs to match those of its trading partners. We incorporate comparative advantage (CA), sectoral heterogeneity, and the interaction of tariff policy with monetary policy. The results suggest that while tariff equalization can reduce trade imbalances and improve U.S. terms of trade, it generates efficiency losses and results in ambiguous welfare outcomes. A calibrated policy mix is required to balance trade, inflation, growth, and equity objectives.

While the administration framed these tariff reciprocal measures as essential for addressing trade imbalances and strengthening American manufacturing, our analysis identifies significant economic repercussions for developing economies. Key findings include the disproportionate impact on developing nations with export-oriented growth strategies, disruption of global value chains, potential reversal of development gains, and acute vulnerability for many African and Asian nations that face some of the highest tariff rates. The policy would likely trigger structural economic changes in the global trading system, with implications that extend well beyond the immediate tariff impacts.

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I. INTRODUCTION AND POLICY BACKGROUND

On April 2, 2025, President Trump invoked the International Emergency Economic Powers Act (IEEPA) to declare a national emergency addressing what the administration described as a "large and persistent U.S. trade deficit" that constitutes "an unusual and extraordinary threat to the national security and economy of the United States." The resulting executive order established a two-tiered tariff system:

1. A baseline 10% tariff on all imports to the U.S. (effective April 5, 2025)
2. "Reciprocal tariffs" ranging from 11% to 50% on 57 countries identified as engaging in non-reciprocal trading practices (effective April 9, 2025). Some of the highest tariffs are shown in Table 1.

This policy aims to address what the administration views as fundamental imbalances in global trade. President Trump characterized the situation as one where "for decades, our country has been looted, pillaged, raped and plundered by nations near and far, both friend and foe alike." The tariffs are aimed at countries with which the U.S. runs significant trade deficits or that impose relatively high tariffs on American goods. Table 1 highlights some of the highest rates.

Table 1

Reciprocal Tariffs Announced on April 2, 2025

Country	Reciprocal Tariff, Adjusted	Income Status
Lesotho	50%	LMI
Cambodia	49%	LMI
Laos	48%	LMI
Madagascar	47%	LI
Vietnam	46%	LMI
Myanmar	44%	LMI
Sri Lanka	44%	LMI
Falkland Islands	41%	N/A
Syria	41%	LI

Source: White House (2025). " Regulating Imports with a Reciprocal Tariff to Rectify Trade Practices that Contribute to Large and Persistent Annual United States Goods Trade

Deficits."https://www.whitehouse.gov/wp-content/uploads/2025/04/Annex-I.pdf and World Bank 2025 Classification of Countries https://datahelpdesk.worldbank.org/knowledgebase/topics/19280-country-classification

Note: LMI is Lower Middle-income country, LI is Lower income.

Other countries affected include South Africa (30%), India (26%), and Japan (24%). Morocco, by comparison, faced a baseline tariff of 10%. Some exemptions apply, including USMCA-compliant exports from Mexico and Canada; steel, aluminum, and automotive products already subject to Section 232 tariffs; copper, pharmaceuticals, semiconductors, and lumber; and energy products and certain minerals not available in the U.S.

On April 9, 2025, just hours after these enhanced tariffs took effect, President Trump announced a 90-day pause on his "reciprocal tariff" policy. This suspension applied to all countries except China, which remained subject to even higher tariffs due to its retaliatory measures. The 90-day suspension was set to expire on July 8, 2025. During this period, the U.S. maintained a 10% baseline tariff while engaging in discussions with affected countries to address trade imbalances and practices. On May 12, 2025, the U.S. and China established a 90-day truce wherein both countries agreed to significantly reduce tariffs: the U.S. lowered tariffs on Chinese imports from 145% to 30%, while China reduced tariffs on U.S. goods from 125% to 10%. This temporary arrangement aimed to de-escalate trade tensions and provide a framework for further negotiations.

As of this writing (end May 2025), bilateral negotiations are ongoing and only the UK has reached a trade agreement with the U.S., announced on May 8, 2025. However, this agreement maintains the 10% baseline tariff on UK products and is described as more of a first installment in ongoing negotiations rather than a comprehensive trade deal. It is expected that more trade agreements with other countries will be reached by July 8, 2025, when the current tariff pause expires. Trump has indicated that tariffs may be reimposed sooner, possibly within two or three weeks, if deals are not reached.

Until then, it will be difficult to predict what the final tariffs will be. Therefore, in this paper, we will rely on a theoretical framework to analyze the possible impact of these reciprocal tariffs on trade and global welfare. Section II presents the basic components of a two-country reciprocal tariff model U.S.-ROW (Rest of World, with ROW considered the developing countries) while section III extends the model to account for CA and monetary and exchange rate effects. In Section IV, we discuss the policy implications of the model's insights, including the sectoral impacts of tariff equalization, the interaction of monetary and exchange rate policies, inflation dynamics, global production reorganization, macroeconomic stability, strategic international considerations, long-run growth and efficiency, and optimal policy approach.

II. THE BASIC TRADE MODEL

1. Model Setup

Consider a two-country world: the U.S. and the Rest of World (ROW). Each country produces and trades a variety of goods. Initially, ROW imposes higher tariffs than the U.S., and the U.S. runs a trade deficit. We analyze what happens when the U.S. raises its tariffs to match those of ROW.

$$\text{Countries: } i\{US, ROW\}$$
$$\text{Goods: } j\{1,2, \dots, J\}$$

Key variables:
Y_{ij} : Production of good j in country i
C_{ij} : Consumption of good j in country i
X_{ij} : Exports of good j from country i to the other country
P_{ij} : Domestic price of good j in country i
P_j^w : World price of good j
τ_i : Tariff rate imposed by country i on imports
ω_{ij} : Production efficiency parameter for good j in country i
NX_i : Net exports (trade balance) of country i

2. Initial Conditions

We assume the following initial conditions:

$$\tau_{US}^0 < \tau_{ROW}^0 \quad \text{(U.S. has lower initial tariffs)}$$
$$NX_{US}^0 < 0 \quad \text{(U.S. has trade deficit)}$$
$$NX_{ROW}^0 > 0 \quad \text{(ROW has trade surplus)}$$

3. Policy Change

The U.S. raises its tariffs to match ROW:

$$\tau_{US}^1 = \tau_{ROW}^0 = \tau_{ROW}^1 = \tau$$

4. Production Constraints

Each country faces a production possibility frontier based on its factor endowments:

$$\sum_{j=1}^{J} \frac{Y_{ij}}{\omega_{ij}} \leq L_i$$

where L_i is the total factor endowment in country i.

5. Consumer Preferences

Consumers maximize a CES utility function:

$$U_i = \left(\Sigma_{j=1}^{J} C_{ij}^{(\sigma-1)/\sigma}\right)^{\sigma/(\sigma-1)}$$

subject to their budget constraint:

$$\sum_{j=1}^{J} P_{ij} C_{ij} = I_i$$

where I_i is national income, including tariff revenue.

6. Prices and Tariffs

Domestic prices in each country are related to world prices through tariffs:

$$P_{US,j} = \begin{matrix} P_j^w, & \text{for goods produced in U.S.} \\ P_j^w(1+\tau_{US}), & \text{for goods imported from ROW} \end{matrix}$$

$$P_{ROW,j} = \begin{matrix} P_j^w, & \text{for goods produced in ROW} \\ P_j^w(1+\tau_{ROW}), & \text{for goods imported from U.S.} \end{matrix}$$

7. Market Clearing

For each good, total production must equal total consumption:

$$Y_{US,j} + Y_{ROW,j} = C_{US,j} + C_{ROW,j}$$

8. Trade Balance

Net exports for each country are defined as:

$$NX_{US} = \sum_{j=1}^{J} P_j^w X_{US,j} - \sum_{j=1}^{J} P_j^w X_{ROW,j}$$

$$NX_{ROW} = \sum_{j=1}^{J} P_j^w X_{ROW,j} - \sum_{j=1}^{J} P_j^w X_{US,j} = -NX_{US}$$

9. Analysis of Tariff Equalization Effects

Terms of Trade Effect

When the U.S. raises its tariffs, this affects world prices. For a good j that the U.S. imports:

$$\frac{\partial P_j^w}{\partial \tau_{US}} < 0$$

When a large economy like the U.S. imposes higher tariffs, it creates a powerful market mechanism that can depress world prices and improve U.S. terms of trade. This occurs through an important economic process that leverages the U.S.'s substantial market power in global trade. The effect is stronger for goods where the U.S. has significant market power (typically capital-intensive goods).

The mechanism begins when higher U.S. tariffs make foreign goods more expensive in the American market, naturally reducing the quantity of imports demanded by U.S. consumers and businesses. Since the U.S. represents approximately 15-20% of global trade, this reduction in demand creates a significant shock to international markets. Foreign producers who had been selling substantial quantities to the U.S. suddenly face dramatically reduced demand for their products, creating excess supply in global markets.

This excess supply forces foreign producers to compete more aggressively for the remaining available markets worldwide. With reduced access to the large and lucrative U.S. market, exporters must either absorb lower prices to maintain market share elsewhere or risk losing sales entirely. The intensified competition among suppliers drives down world prices, which represent the international prices at which goods trade globally.

The improvement in U.S. terms of trade emerges from this price adjustment. Terms of trade are calculated as the ratio of export prices to import prices, so when world prices of imported goods fall while U.S. export prices remain relatively stable, the ratio increases favorably for the U.S.. Essentially, the U.S. can now purchase more foreign goods with the same amount of its own exports, representing a transfer of economic value from foreign producers to American buyers.

This effect is mathematically represented in the model as the partial derivative of world prices with respect to U.S. tariffs being negative, confirming that higher tariffs lead to lower world prices. The mechanism works specifically because the U.S. possesses significant market power derived from its large market size, the limited ability of many countries to quickly substitute other markets for U.S. demand, and the substantial adjustment costs that producers face when seeking new buyers and restructuring their distribution networks.

Current examples illustrate this dynamic clearly. Asian electronics manufacturers facing new U.S. tariffs must redirect their products to European or other Asian markets, often accepting lower prices due to increased competition. Similarly, countries like Vietnam and Cambodia, now facing tariffs of 46-49%, may need to reduce their export prices substantially to maintain any meaningful access to the U.S. market. Agricultural exporters worldwide experience similar pressures when the U.S. reduces its import demand for specific crops.

However, several important caveats limit this effect. The terms of trade improvement is strongest for goods where the U.S. represents a large share of global demand and may be more pronounced in the short run before producers fully adjust their strategies. Additionally, the risk

of retaliation from other countries could potentially affect U.S. export prices, partially offsetting the gains.

While the terms-of-trade improvement represents one of the few ways that large countries can potentially benefit from imposing tariffs, it comes with significant offsetting costs that must be carefully weighed. U.S. consumers face higher domestic prices, the economy experiences reduced efficiency from trade restrictions, and supply chains may suffer disruptions. The overall welfare effect remains ambiguous and depends on whether the terms of trade gains outweigh these various costs of protection, which explains why the model concludes that tariff policies produce complex and often contradictory economic outcomes.

Trade Volume Effect

Higher U.S. tariffs reduce the volume of U.S. imports:

$$\frac{\partial X_{ROW,j}}{\partial \tau_{US}} < 0$$

This creates inefficiency as production shifts from low-cost to high-cost producers.

Revenue Effect

The tariff revenue collected by the U.S. increases, at least initially:

$$TR_{US} = \tau_{US} \sum_{j=1}^{J} P_j^w X_{ROW,j}$$

Revenue initially rises with higher tariffs but eventually falls as import volumes decrease significantly.

Trade Balance Effect

The U.S. trade deficit is likely to decrease:

$$\partial \tau_{US} > 0$$

This occurs because:

1. Higher tariffs reduce U.S. import volume.
2. Improved terms of trade means the U.S. pays less for its imports.
3. Some production shifts back to the U.S. (import substitution).

Equilibrium Adjustment

In the new equilibrium with $\tau_{US} = \tau_{ROW} = \tau$:

1. World prices adjust to balance global supply and demand.
2. The U.S. trade deficit decreases but may not be eliminated.
3. Production patterns shift, with more domestic production in previously import-competing sectors.
4. Consumer prices rise in both countries, but especially in the U.S.
5. Global trade volume decreases.

Policy Implications

For the U.S., its trade deficit is likely to decrease, though not necessarily to zero. External macroeconomic factors (savings-investment imbalance) remain important determinants of the trade balance (Lin, Dinh, and Im, 2010). The U.S. may experience terms of trade gains, particularly in specific goods where it is a major importer. Import-competing sectors are likely to benefit, while export sectors and industries could face challenges. While consumers face higher prices, the increased tariff revenue could be used to offset other taxes or fund government programs which could reduce this adverse impact.

The overall welfare effects therefore are ambiguous and depend on the magnitude of terms of trade gains, the scale of deadweight losses from reduced trade, the importance of imported varieties to consumers, and the initial tariff levels and trade patterns.

For the ROW, their exports to the U.S. decrease, potentially causing economic disruption in export-oriented sectors. ROW likely experiences worse terms of trade, and its trade surplus with the U.S. shrinks. They may consider further trade policy adjustments, potentially leading to trade tensions or negotiations.

In terms of global impact, global efficiency decreases as production shifts from CA patterns (see the next section). Trump's policy action also raises questions about stable equilibria in trade policy—specifically whether mutual high protection constitutes a stable equilibrium. Furthermore, this could potentially challenge the WTO framework if tariff increases exceed bound rates—violating not only the terms of the agreed limits but also the "Most Favored Nation" (MFN) clause, according to which no member country should be treated less advantageously than any other by the granting country. On the other hand, U.S. tariff increases may serve as a bargaining chip to negotiate mutual tariff reductions. Finally, the ultimate impact on trade and the global economy depends on monetary and exchange rate policies conducted at the same time as the tariff policy in question. Exchange rate adjustments or other macroeconomic policies might address trade imbalances with fewer distortions.

In conclusion, raising U.S. tariffs to match ROW levels could reduce the U.S. trade deficit through multiple channels, but with significant economic costs. While some sectors would benefit,

consumers would face higher prices and global efficiency would decrease. The policy might be effective as a temporary bargaining strategy to achieve mutual tariff reductions, but maintaining higher tariffs as a permanent policy would likely reduce economic welfare over the long run. Alternative policies addressing macroeconomic imbalances might better address persistent trade deficits with fewer distortionary effects (Drysdale et al., 2025).

III. THE EXTENDED MODEL: COMPARATIVE ADVANTAGE, MONETARY AND EXCHANGE RATE EFFECTS

1. Model Setup

The above framework shows the basic elements of international trade. In what follows, we incorporate more realistic features into the model, including CA and the effects of monetary and exchange rate policies. The inclusion of CA allows for sectoral distinctions, while monetary and exchange rate policies may either reinforce or offset the initial impact of tariffs on the trade balance.

A. Comparative Advantage (CA) Structure

We partition goods into labor-intensive (L) and capital-intensive (K) categories:

$\omega_{ROW,j} > \omega_{US,j}$ for all jL (ROW has CA in labor-intensive goods)
$\omega_{US,j} > \omega_{ROW,j}$ for all jK (U.S. has CA in capital-intensive goods)

B. Policy Changes

We analyze two simultaneous policy changes:

$\tau_{US}^{1} = \tau_{ROW}^{0} = \tau_{ROW}^{1} = \tau$ (U.S. tariff equalization)
$r_{US}^{1} < r_{US}^{0}$ (U.S. interest rate reduction)

Given the pressure President Trump has placed on the Federal Reserve Chair to lower interest rates, a reduction in U.S. interest rates is more likely than an increase.

C. Production Constraints

Each country faces a production possibility frontier based on its factor endowments:

$$\sum_{j=1}^{J} \frac{Y_{ij}}{\omega_{ij}} \leq L_i$$

where L_i is the total factor endowment in country i.

D. Consumer Preferences

Consumers maximize a CES utility function:

$$U_i = \sum_{j=1}^{J} C_{ij}^{\frac{\sigma-1}{\sigma}}{}^{\frac{\sigma}{\sigma-1}}$$

subject to their budget constraint:

$$\sum_{j=1}^{J} P_{ij} C_{ij} = I_i$$

where I_i is national income, including tariff revenue.

E. Prices and Tariffs

Domestic prices in each country are related to world prices through tariffs:

$$P_{US,j} = \begin{cases} P_j^w, & \text{for goods produced in U.S.} \\ P_j^w(1+\tau_{US}), & \text{for goods imported from ROW} \end{cases}$$

$$P_{ROW,j} = \begin{cases} P_j^w, & \text{for goods produced in ROW} \\ P_j^w(1+\tau_{ROW}), & \text{for goods imported from U.S.} \end{cases}$$

F. Market Clearing

For each good, total production must equal total consumption:

$$Y_{US,j} + Y_{ROW,j} = C_{US,j} + C_{ROW,j}$$

G. Trade Balance

Net exports for each country are defined as:

$$NX_{US} = \sum_{j=1}^{J} P_j^w X_{US,j} - \sum_{j=1}^{J} P_j^w X_{ROW,j}$$

$$NX_{ROW} = \sum_{j=1}^{J} P_j^w X_{ROW,j} - \sum_{j=1}^{J} P_j^w X_{US,j} = -NX_{US}$$

H. Monetary Policy and Exchange Rate

The exchange rate is affected by interest rate differentials:

$$E = f(r_{US} - r_{ROW}, \dots) \text{ where } \frac{\partial E}{\partial (r_{US} - r_{ROW})} > 0$$

I. Balance of Payments Identity

For each country, the current and capital accounts must balance:

$$NX_{US} + KA_{US} = 0$$

$$KA_{US} = g(r_{US} - r_{ROW}, \dots) \text{ where } \frac{\partial KA_{US}}{\partial (r_{US} - r_{ROW})} < 0$$

ANALYSIS OF TARIFF EQUALIZATION EFFECTS

A. Terms of Trade Effect

When the U.S. raises its tariffs, this affects world prices. For a good j that the U.S. imports:

$$\frac{\partial P_j^w}{\partial \tau_{US}} < 0$$

Higher U.S. tariffs tend to depress world prices of goods it imports, improving U.S. terms of trade.

B. Trade Volume Effect

Higher U.S. tariffs reduce the volume of U.S. imports:

$$\frac{\partial X_{ROW,j}}{\partial \tau_{US}} < 0$$

This effect is stronger for labor-intensive goods where the price elasticity of demand is higher. This creates inefficiency as production shifts from low-cost to high-cost producers.

C. Revenue Effect

The tariff revenue collected by the U.S. increases, at least initially:

$$TR_{US} = \tau_{US} \sum_{j=1}^{J} P_j^w X_{ROW,j}$$

Revenue initially rises with higher tariffs but eventually falls as import volumes decrease significantly.

D. Trade Balance Effect

The U.S. trade deficit is likely to decrease due to tariff equalization:

$$\frac{\partial NX_{US}}{\partial \tau_{US}} > 0$$

This effect is enhanced by the interest rate reduction:

$$\frac{\partial NX_{US}}{\partial r_{US}} < 0$$

The combined effect of tariff increases and interest rate reduction on the trade balance is stronger than either policy alone:

$$\frac{\partial NX_{US}}{\partial \tau_{US}} + \frac{\partial NX_{US}}{\partial r_{US}} \frac{\partial r_{US}}{\partial MP} > \frac{\partial NX_{US}}{\partial \tau_{US}}$$

where MP represents monetary policy expansion.

E. Exchange Rate Effect

Lower U.S. interest rates tend to depreciate the U.S. dollar:

$$\frac{\partial E}{\partial r_{US}} < 0$$

This effect reinforces the tariff impact on trade flows:

$$\frac{\partial X_{US,j}}{\partial E} > 0 \quad \text{(U.S. exports increase with dollar depreciation)}$$
$$\frac{\partial X_{ROW,j}}{\partial E} < 0 \quad \text{(U.S. imports decrease with dollar depreciation)}$$

CA EFFECTS

A. Sectoral Production Impacts

The effect of tariff equalization on production varies by sector type:
For Labor-Intensive Goods (U.S. CA):

$$\frac{\partial Y_{US,j}}{\partial \tau_{US}} > 0 \text{ for } jL$$
$$\frac{\partial Y_{ROW,j}}{\partial \tau_{US}} < 0 \text{ for } jL$$

The production shifts are larger for these goods because:

$$\frac{\partial Y_{US,j}}{\partial \tau_{US}}_{j} > \frac{\partial Y_{US,j}}{\partial \tau_{US}}_{jK}$$

For Capital-Intensive Goods (U.S. CA):

$$\frac{\partial Y_{US,j}}{\partial \tau_{ROW}} < 0 \text{ for } jK$$
$$\frac{\partial Y_{ROW,j}}{\partial \tau_{ROW}} > 0 \text{ for } jK$$

B. Welfare Effects with CA

The welfare cost of tariff-induced production shifts is higher when they contradict CA:

$$W_{\text{loss}} \sum_j \frac{\omega_{ROW,j}}{\omega_{US,j}} - 1 \, \Delta Y_{US,j} + \sum_j \frac{\omega_{US,j}}{\omega_{ROW,j}} - 1 \, \Delta Y_{ROW,j}$$

This welfare loss is partially offset by terms of trade gains and tariff revenue.

C. Monetary Policy Interaction with CA

Interest rate reduction strengthens the sectoral effects through exchange rate channels:

$$\frac{\partial Y_{US,j}}{\partial r_{US}} < 0 \text{ (U.S. production increases as interest rates fall)}$$

This effect is stronger for capital-intensive sectors due to both reduced capital costs and exchange rate effects:

$$\frac{\partial Y_{US,j}}{\partial r_{US}}_{j\ K} > \frac{\partial Y_{US,j}}{\partial r_{US}}_{j\ L}$$

EQUILIBRIUM ADJUSTMENT

In the new equilibrium with $\tau_{US} = \tau_{ROW} = \tau$ and reduced U.S. interest rates:

A. Price Adjustments

$$P_j^{w,1} = P_j^{w,0} + \frac{\partial P_j^w}{\partial \tau_{US}} \Delta \tau_{US} + \frac{\partial P_j^w}{\partial r_{US}} \Delta r_{US}$$
$$P_{US,j}^1 = P_j^{w,1} \ (1 + \tau) \text{ for imported goods}$$
$$P_{ROW,j}^1 = P_j^{w,1} \ (1 + \tau) \text{ for imported goods}$$

B. Production Reallocation

$$Y^1_{US,j} = Y^0_{US,j} + \frac{\partial Y_{US,j}}{\partial \tau_{US}} \Delta\tau_{US} + \frac{\partial Y_{US,j}}{\partial r_{US}} \Delta r_{US}$$

$$Y^1_{ROW,j} = Y^0_{ROW,j} + \frac{\partial Y_{ROW,j}}{\partial \tau_{US}} \Delta\tau_{US} + \frac{\partial Y_{ROW,j}}{\partial r_{US}} \Delta r_{US}$$

C. Trade Balance Adjustment

$$NX^1_{US} = NX^0_{US} + \frac{\partial NX_{US}}{\partial \tau_{US}} \Delta\tau_{US} + \frac{\partial NX_{US}}{\partial r_{US}} \Delta r_{US}$$
$$= NX^0_{US} + \Delta NX^{\tau}_{US} + \Delta NX^{r}_{US}$$

Given the initial conditions and model parameters, we expect:

$NX^1_{US} > NX^0_{US}$ (reduction in U.S. trade deficit)

D. **Exchange Rate Adjustment**

$$E^1 = E^0 + \frac{\partial E}{\partial r_{US}} \Delta r_{US} < E^0 \text{ (U.S. dollar depreciation)}$$

E. Capital Account Adjustment

$$KA^1_{US} = KA^0_{US} + \frac{\partial KA_{US}}{\partial r_{US}} \Delta r_{US}$$
$$= KA^0_{US} + \Delta KA^{r}_{US} < KA^0_{US} \text{ (reduced capital inflows to U.S.)}$$

IV. POLICY IMPLICATIONS

A. Sectoral Impacts of Tariff Equalization

The implementation of reciprocal tariff policies creates distinctly different effects across economic sectors, fundamentally altering the competitive landscape for both domestic and international producers. Understanding these differential impacts is crucial for policymakers seeking to optimize the benefits while minimizing unintended consequences of tariff equalization measures.

For the U.S.:

Labor-Intensive Industries: Protection Paradox and Efficiency Challenges. Labor-intensive sectors in the U.S. experience the most pronounced protective effects from tariff increases, receiving substantial insulation from foreign competition through higher import barriers. These

industries, which include textiles, apparel, furniture manufacturing, and basic assembly operations, see the largest increases in domestic production and import substitution activities. According to data from the Bureau of Labor Statistics, there are nearly half a million open manufacturing jobs at this time and this number has been in decline over the years, indicating that even without protection, these sectors struggle with fundamental competitiveness issues.

This protection comes at significant economic cost because these sectors do not have fundamental CAs in the U.S. economy. The U.S. lacks the abundant, low-cost labor that makes these industries globally competitive, and domestic wages in these sectors often exceed international competitors by substantial margins. The higher pay that Americans demand to work in manufacturing is one of the main reasons that many manufacturers left the U.S. in the first place. This wage differential creates a situation where protection may temporarily preserve jobs but at the expense of overall economic efficiency.

The efficiency costs are particularly pronounced because the gap between domestic and international production costs is largest in these sectors. When tariffs artificially support production in areas where the U.S. has the greatest comparative disadvantage, the deadweight losses from resource misallocation become substantial. Each job preserved in these protected industries may come at the cost of multiple jobs in more competitive sectors that lose market share due to higher input costs or reduced export competitiveness.

Nevertheless, technological advances offer some potential for mitigating these inefficiencies. Robotization, artificial intelligence (AI), and advanced manufacturing technologies can potentially reduce the labor intensity of these operations, making domestic production more competitive. By 2025, the implementation of robotics is projected to lead to a productivity increase of up to 30% in many industries. If American manufacturers can leverage automation to achieve dramatically higher productivity levels, they may be able to compete effectively despite higher labor costs. If a worker in the U.S. is 20 times as productive as a worker in China, but also must be paid 20 times as much, then both are equally competitive.

Capital-Intensive Sectors: Conflicting Pressures and Technological Advantages

Capital-intensive industries, including aerospace, advanced machinery, chemicals, and high-technology manufacturing, face a more complex set of pressures under tariff equalization policies. These sectors typically experience smaller direct benefits from U.S. tariff increases because they are already globally competitive and rely less on protection from foreign competition. Their competitive advantages stem from technological sophistication, intellectual property, advanced research and development capabilities, and access to highly skilled workers rather than labor cost advantages.

However, these industries face significant challenges from reduced export opportunities as foreign countries maintain or implement retaliatory tariffs. The ROW's high tariffs on American capital-intensive exports directly undermine these sectors' natural CAs. This creates a policy tension where the U.S. may be inadvertently harming its most competitive industries while protecting its least competitive ones.

Recent data on manufacturing construction investment provides evidence of significant capital formation in these sectors. The U.S. Bureau of the Census shows that annualized manufacturing construction spending in the U.S. reached $237 billion in July 2024, up from $128 billion two years earlier—an increase of 86%. Much of this investment has been concentrated in high-technology sectors—particularly semiconductors—where analysts have noted a correlation between the growth in manufacturing construction and the CHIPS Act, a government policy aimed at reshoring the semiconductor industry.

The benefits these sectors receive from potential monetary easing and dollar depreciation—should the Federal Reserve lower interest rates—can partially offset the negative effects of foreign tariffs. Lower capital costs make investments in advanced manufacturing equipment more attractive, while currency depreciation improves export competitiveness. The combination of these effects may allow capital-intensive sectors to maintain their global market positions despite higher foreign tariffs on their products.

For ROW:

Labor-Intensive Export Industries: Structural Displacement and Adjustment Costs.

For developing and emerging economies, labor-intensive manufacturing represents their primary source of CA and often constitutes the backbone of their export-oriented development strategies. These sectors face the most severe disruption from the U.S. tariff increases because they depend heavily on the large U.S. consumer market and have limited ability to quickly substitute alternative markets.

The efficiency losses for these countries are particularly substantial because labor-intensive manufacturing represents their areas of greatest CA. When global trade patterns shift away from these sectors due to U.S. protection, it forces production into less efficient domestic markets or requires costly adjustments to serve alternative export markets. The structural adjustment costs in labor markets become severe as these export industries contract, often creating unemployment in regions heavily dependent on manufacturing employment.

Countries such as Vietnam, Lesotho, and Bangladesh, which face some of the highest reciprocal tariff rates, exemplify this challenge. Vietnam's position as a major footwear manufacturer means that American tariffs directly threaten one of its most successful export industries. The loss of these export opportunities not only reduces immediate employment and foreign

exchange earnings, but also undermines the long-term development pathway that many countries have pursued through export-oriented industrialization.

The geographic concentration of these industries in specific regions within countries amplifies the adjustment challenges. Export-oriented manufacturing typically clusters in coastal areas or special economic zones, creating regional economies heavily dependent on international trade. When these industries contract, entire communities may face economic disruption without alternative employment opportunities.

Capital-Intensive Industries: Continued Protection and Limited Exposure

Capital-intensive sectors in the ROW face less immediate disruption from U.S. tariff policies because they often had limited initial export volumes to the U.S. and continue to receive protection from their own governments' high tariffs. Industries such as steel, heavy machinery, and advanced manufacturing in countries like Germany, Japan, and South Korea maintain substantial protection in their home markets while having less exposure to American trade restrictions.

This asymmetry creates a situation where these sectors may actually benefit relative to their labor-intensive counterparts within the same economies. As resources and investment shift away from export-oriented light manufacturing, capital-intensive industries may gain access to freed-up labor and capital at lower costs. However, this internal reallocation may not fully compensate for the overall economic contraction resulting from reduced export earnings.

B. Monetary Policy Interaction Effects

The interaction between tariff policies and monetary policy creates complex feedback effects that can either amplify or offset the direct impacts of trade restrictions. Understanding these interactions is crucial for predicting the overall economic consequences of tariff equalization policies.

Exchange Rate Dynamics and Trade Balance Effects

When the U.S. implements expansionary monetary policy alongside tariff increases, the resulting exchange rate movements create significant secondary effects on trade flows. Lower U.S. interest rates tend to depreciate the dollar, which counteracts some of the tariff-induced changes in trade patterns. This dollar depreciation makes American exports more competitive in international markets despite foreign retaliatory tariffs, while simultaneously making imports more expensive beyond the direct tariff effect.

The net impact on the U.S. trade balance becomes more pronounced than would result from either policy alone. Tariffs directly reduce import volumes while potentially improving terms of trade, while dollar depreciation provides additional support for export competitiveness and import price increases. This combined effect creates stronger pressure to reduce trade deficit, although the specific magnitude depends on the relative price elasticities of U.S. imports and exports.

However, this monetary-trade policy combination creates significant challenges for trading partners. Countries whose currencies appreciate relative to the dollar face a double burden: their exports become more expensive in dollar terms while also facing higher tariff barriers. This can create severe competitive pressures, particularly for countries whose export industries depend heavily on price competitiveness.

Capital Flow Implications and Balance of Payments Adjustments.

When the U.S. pursues expansionary monetary policy, reduced interest rates tend to encourage capital outflows as investors seek higher returns in foreign markets. These increased capital outflows require offsetting improvement in the trade balance to maintain overall equilibrium. This relationship means that monetary easing reinforces the trade balance effects of tariff policy through capital market channels. The combined effect of tariffs and monetary policy creates stronger pressure for U.S. trade deficit reduction than either policy would achieve independently. However, this also means that trading partners face not only reduced export opportunities from tariffs but also potentially reduced capital inflows from the U.S.

The coordination of these policies can create significant international economic tensions. Developing countries' governments may view the combination of trade restrictions and monetary expansion as deliberately designed to improve American competitiveness at their expense, potentially leading to accusations of unfair economic practices or "beggar-thy-neighbor" policies.

Inflation Dynamics and Policy Constraints

The inflationary implications of combining expansionary monetary policy with tariff increases create important policy constraints and trade-offs. Tariffs directly increase the prices of imported goods, contributing to domestic inflation. Simultaneously, monetary expansion tends to stimulate domestic demand and can lead to broader price pressures throughout the economy. Currency depreciation resulting from lower interest rates adds a third inflationary channel by increasing the domestic currency cost of imports.

This combination of inflationary pressures may significantly constrain the scope for continued expansionary monetary policy, creating a policy dilemma. If inflation accelerates beyond acceptable levels, monetary authorities may be forced to tighten policy, thereby undermining the exchange rate and capital flow effects that support the trade balance objectives of tariff policy.

The inflation impact also reduces the real purchasing power of American consumers, potentially undermining public support for tariff policies. Higher prices for both domestic and imported goods may create political pressure to reduce or eliminate tariffs, especially if the promised benefits in terms of employment and manufacturing investment fail to materialize quickly enough to offset the immediate cost increases.

C. Global Production Reorganization and Supply Chain Transformation

The implementation of comprehensive tariff policies accelerates fundamental changes in global production patterns and supply chain organization, with effects that extend far beyond the immediate trade impacts.

Reshoring Acceleration and Domestic Manufacturing Revival

Recent data provides compelling evidence of accelerated reshoring to the U.S., driven both by tariff policies and broader supply chain security concerns. Construction spending on manufacturing increased by 40% in 2022 compared to 2021, and the growth continued in 2023, according to the U.S. Treasury Department. This dramatic increase in manufacturing construction represents the most significant domestic manufacturing investment boom in decades.

The reshoring trend particularly benefits capital-intensive industries where the U.S. maintains technological advantages. Advanced manufacturing sectors, including semiconductors, aerospace components, and high-technology machinery, are experiencing substantial new investment as companies seek to reduce dependence on complex international supply chains. According to the Reshoring Initiative, the cumulative number of jobs brought back since 2010 is nearing two million, about 40% of what the U.S. lost to offshoring, with a record 343,304 jobs announced in 2022 and 287,299 announced in 2023.

However, the efficiency implications of reshoring vary significantly across sectors. For capital-intensive industries with existing competitive advantages, reshoring may enhance both economic security and efficiency by reducing supply chain complexity and transportation costs. For labor-intensive sectors, reshoring creates larger efficiency losses because it moves production from low-cost to high-cost locations without corresponding productivity advantages.

The role of automation in enabling competitive reshoring cannot be overstated. Modern American manufacturing facilities increasingly rely on advanced robotics, AI, and automated systems to offset higher labor costs. The mission of the Reshoring Initiative is to bring good, well-paying manufacturing jobs back to the U.S. by assisting companies to more accurately assess the total cost of offshoring and shift thinking from “offshoring is cheaper” to “local reduces the total

cost of ownership.” This total cost approach recognizes that simple labor cost comparisons may miss broader factors including supply chain risk, transportation costs, and quality control considerations.

Global Value Chain Reconfiguration and Efficiency Losses

Traditional global value chains, characterized by vertical specialization across multiple countries, face fundamental disruption from comprehensive tariff policies. Companies must reorganize production networks to minimize tariff exposure, often requiring costly adjustments to established supply relationships and production processes.

The disruption is particularly severe for industries with complex, multi-stage production processes. Electronics manufacturing, automotive production, and advanced machinery often involve components and sub-assemblies crossing international borders multiple times during production. Each border crossing now faces potential tariff implications, making the cumulative cost of maintaining international supply chains substantially higher.

Firms may respond by reorganizing production to reduce the number of international transactions within their supply chains. This may involve consolidating production in fewer countries, developing regional supply networks rather than global ones, or bringing previously outsourced activities in-house to avoid international transactions entirely. While these adjustments may reduce tariff exposure, they often sacrifice efficiency gains from specialization and CA.

The potential for "tariff-jumping" foreign direct investment represents one form of adaptation, where foreign companies establish production facilities within the U.S. to avoid tariff barriers. While this may preserve some efficiency gains from foreign expertise and capital, it also requires substantial new investment and may not fully replicate the cost advantages of international production networks.

Regional Production Clusters and Economic Geography

The reorganization of global production is creating new patterns of economic geography, with production increasingly concentrated in regional clusters serving specific market areas. North American production networks, leveraging USMCA agreements and geographic proximity, are expanding to serve both American and regional markets. European production networks are similarly consolidating to serve European markets, while Asian production clusters focus on serving Asian demand. The African market may be moving toward a similar arrangement.

This regionalization may reduce some of the efficiency losses from tariff policies by maintaining specialization and scale economies within regional markets. However, it also reduces the global integration that has been a primary source of efficiency gains in international trade over recent decades.

The economic implications for different regions vary substantially. Countries with large domestic markets or preferential access agreements may benefit from becoming regional production hubs. Smaller countries that had previously participated in global supply chains through specialized production of particular components may find themselves marginalized in the new regional production networks.

D. Macroeconomic Stability and Policy Coordination Challenges

The interaction of trade and monetary policies creates significant challenges for macroeconomic stability and international policy coordination, with implications that extend well beyond the immediate trade policy objectives.

Internal Economic Balance and Growth Trade-offs

The combination of expansionary monetary policy and protective tariffs creates conflicting pressures on domestic economic performance. Monetary expansion stimulates aggregate demand and supports short-term economic growth, while tariffs shift demand from foreign to domestic producers and may boost particular sectors. In the short term, this combination can generate stronger GDP growth than either policy alone.

However, these short-term benefits come with significant longer-term costs. The efficiency losses from tariff protection tend to reduce productivity growth over time, while expansionary monetary policy in an already-heated economy may contribute to asset bubbles or excessive leverage. The inflation generated by both policies may require eventual monetary tightening that could trigger economic contraction.

Recent manufacturing data suggests some near-term benefits from these policies. The U.S. Institute for Supply Management reports an optimistic 4.2% revenue increase for U.S. manufacturers in 2025, driven by technological advancements, nearshoring, and economics. However, manufacturers continue to face higher costs: The producer price index for input materials and components seems to have stabilized but remains high, while total compensation, which includes wages and benefits, has continued its upward climb.

The sustainability of these growth effects depends critically on whether productivity gains can offset the efficiency losses from protection. If American manufacturing can achieve substantial productivity gains through automation and technological advancement, the combination of protection and monetary stimulus may support a transition to a more competitive domestic

manufacturing base. If not, the policies may simply delay necessary economic adjustments while creating inflation and resource misallocation.

External Balance and International Economic Relations

The external balance effects of combined trade and monetary policies create significant tensions in international economic relations. While both policies work toward reducing the U.S. trade deficit, they do so in ways that impose costs on trading partners. Foreign countries, especially developing countries, face both reduced export opportunities from tariffs and potentially reduced capital inflows from U.S. monetary expansion.

These beggar-thy-neighbor effects may provoke retaliation that undermines the intended benefits of the policy combination. Countries may respond with their own tariffs, capital controls, or competitive currency interventions that escalate trade tensions and reduce global economic efficiency. The risk of a broader trade war increases when policies are perceived as deliberately designed to gain advantage at the expense of other countries.

The international monetary cooperation that has been crucial for global financial stability may also be undermined by policies that create large exchange rate movements and capital flow volatility. Central bank coordination becomes more difficult when countries pursue monetary policies primarily for domestic trade balance objectives rather than broader economic stability goals.

Long-term Productivity and Innovation Implications

The long-term effects on productivity and innovation represent perhaps the most important policy considerations. Protection from international competition may reduce incentives for innovation and efficiency improvements in protected industries. If domestic producers can maintain market share through tariff barriers rather than competitive advantage, they may have reduced incentives to invest in research and development or process improvements.

However, the effects on innovation are not uniformly negative. Reshoring of production may increase innovation in certain sectors by bringing research and development activities closer to manufacturing operations. The U.S. has a first-mover advantage in several areas of AI, which can translate into higher workforce productivity, enhancing the global competitiveness of American manufacturing globally and potentially ushering in a new era of growth and prosperity. The integration of AI and advanced manufacturing technologies may generate productivity gains that partially offset the efficiency losses resulting from protectionist policies.

The net effect on technological progress depends on whether the benefits from industrial concentration and knowledge spillovers outweigh the costs of reduced competitive pressure. Industries that successfully combine protection with substantial investment in automation and

innovation may emerge more competitive internationally. Those that simply rely on protection without productivity improvements may become permanently dependent on trade barriers.

The automation trend is already transforming manufacturing employment patterns. Automation is expected to displace around 20 million manufacturing jobs by 2030, but the adoption of robots is expected to create over 12 million new jobs by 2025. The skills required for these new positions are substantially different, emphasizing technical capabilities and human-machine collaboration rather than traditional manufacturing skills.

E. Strategic International Considerations and Optimal Policy Design

The design of effective tariff and monetary policy combinations requires careful consideration of international strategic dynamics and optimization of multiple policy objectives simultaneously.

Bargaining Dynamics and Negotiation Strategy

The use of tariff equalization as a bargaining tool creates complex strategic interactions with trading partners. The credible threat of maintaining high tariffs may encourage other countries to reduce their own trade barriers or address specific U.S. concerns about trade practices. However, the effectiveness of this approach depends on careful calibration of both the magnitude and duration of tariff increases.

Recent evidence suggests mixed results from tariff-based negotiation strategies. Vietnam reportedly offered to reduce its own tariffs on U.S. products to 0%, but the U.S. declined—signaling that the current administration prioritizes trade balance outcomes over tariff reciprocity itself. This approach may limit the potential for mutually beneficial agreements that reduce barriers on both sides.

The monetary policy component of the strategy may actually undermine bargaining effectiveness by reducing the domestic political pressure for trade negotiations. If expansionary monetary policy successfully reduces unemployment and stimulates growth through domestic channels, the urgency for trade agreements may diminish. This could reduce the incentive for aggressive tariff-based bargaining while maintaining the economic costs of protection.

Multilateral Institution Reform and Global Trade Architecture

The unilateral nature of comprehensive tariff policies poses significant challenges to the multilateral trading system and international economic institutions. The use of emergency

powers to implement tariffs without traditional WTO processes undermines the rules-based approach to international trade that has been fundamental to global economic integration.

However, this challenge also creates opportunities for institutional reform. If the current multilateral system is inadequate for addressing legitimate concerns about trade imbalances and unfair practices, unilateral actions may create pressure for more effective international mechanisms. The key question is whether current disruptions lead to improved institutions or to the fragmentation of the global trading system.

The design of future trade agreements may need to incorporate more robust mechanisms for addressing persistent trade imbalances and ensuring genuine reciprocity in market access. This might include automatic adjustment mechanisms, enhanced dispute resolution procedures, or new frameworks for addressing non-tariff barriers and currency manipulation.

Optimal Policy Design and Implementation Strategy

The analysis suggests several principles for optimizing the design of tariff and monetary policy combinations. First, targeting should focus on sectors where terms of trade gains are largest and where domestic production has genuine potential for improvement through investment and innovation. Broad-based protection of sectors with fundamental comparative disadvantages is likely to generate large efficiency costs with limited strategic benefits.

Second, phased implementation allows time for structural adjustment and reduces the risk of economic disruption. Gradual tariff increases give domestic industries time to invest in productivity improvements while allowing trading partners to adjust their policies and practices. Sudden, comprehensive changes risk provoking backlash and retaliation that could undermine policy effectiveness.

Third, complementary domestic policies are essential for addressing the distributional consequences of trade policy changes. Worker retraining programs, regional development initiatives, and targeted support for communities affected by industrial transformation can help ensure that the benefits from protection are broadly shared while minimizing social and political costs.

Fourth, coordination of monetary and trade policies should take into account inflationary effects and avoid excessive stimulus that might necessitate painful adjustments later. The goal should be to support structural economic transformation rather than short-term demand stimulation that proves unsustainable.

Finally, maintaining open channels for international negotiation and cooperation is crucial for achieving long-term policy success. Tariff policies should be designed as transitional measures that create incentives for improved international agreements rather than permanent features of the trading system. The ultimate objective should be achieving fair and balanced trade relationships that maximize the benefits from international economic integration while addressing legitimate concerns about reciprocity and market access.

F. Conclusion: Balancing Economic Objectives and International Relations

The implementation of tariff equalization policies in combination with monetary expansion represents a significant experiment in economic policy coordination with far-reaching implications for both domestic economic performance and international trade relations. While these policies may achieve short-term objectives related to trade balance improvement and manufacturing support, their long-term success depends critically on careful design and effective implementation.

The sectoral analysis reveals that the benefits and costs of protection are highly uneven, with labor-intensive industries receiving the greatest protection but also generating the largest efficiency losses. Capital-intensive sectors face more complex trade-offs between domestic protection and international competitiveness. The challenge for policymakers is to maximize the benefits from protection of genuinely strategic industries while minimizing the costs from supporting sectors with fundamental competitive disadvantages.

The monetary policy interactions create powerful channels for affecting trade balances and international competitiveness, but also generate significant inflation risks and international tensions. Successful policy coordination requires careful attention to these feedback effects and a willingness to adjust policies as economic conditions evolve.

Perhaps most importantly, the global production reorganization triggered by these policies represents a fundamental shift in international economic relations that will persist well beyond any specific tariff measures. The movement toward regional production networks and reduced global integration may enhance economic security but at the cost of efficiency gains from specialization and CA.

The ultimate success of these policies will be measured not only by their immediate effects on trade balances and domestic manufacturing, but by their contribution to long-term economic competitiveness, international stability, and broad-based prosperity. Achieving these broader objectives requires thoughtful policy design that considers both economic efficiency and

strategic international considerations while maintaining focus on the fundamental goal of improving economic performance in an increasingly complex global economy.

V. LIMITATIONS OF THE MODEL AND DIRECTIONS FOR FURTHER RESEARCH

The two-country model presented here can capture the short-term strategic interactions between major trading partners, particularly the U.S. and the ROW, through a comprehensive static framework that incorporates multiple goods, sectors, and explicit trade flows. This approach provides clarity in understanding how tariff equalization affects bilateral trade patterns, sectoral reallocation, and short-run equilibrium adjustments. The model's strength is its ability to trace through the complex web of immediate effects when the U.S. raises tariffs to match ROW levels, including terms of trade changes, trade volume effects, revenue implications, and the critical interaction with monetary policy through exchange rate channels.

In particular, the integration of monetary and exchange rate policies represents a realistic feature, as it captures how monetary policy creates reinforcing or opposing pressures on the exchange rate relative to tariff policy. The analysis of how higher U.S. interest rates attract capital flows while tariffs aim to improve the trade balance reveals important policy tensions that purely trade-focused models miss. This monetary-trade policy interaction generates insights about the practical challenges of simultaneously pursuing inflation control and trade balance objectives, showing how exchange rate appreciation can partially undermine tariff effectiveness.

The CA structure embedded in this model, distinguishing between labor-intensive and capital-intensive sectors, provides nuanced insights into how industries benefit or suffer from tariff changes. This sectoral detail reveals that protection is more economically costly when it contradicts fundamental CA patterns, an insight that aggregate models cannot capture. The model's ability to analyze how different sectors respond differently to the same tariff policy change illuminates important distributional and efficiency considerations for policymakers.

However, the model's static nature, while providing analytical clarity, necessarily limits its ability to address several crucial dimensions of the tariff impact story. The model cannot capture how economies adjust over time to new tariff regimes, missing the dynamic costs and benefits that unfold along the transition path. When tariffs change, real economies do not instantly jump to new equilibria but instead follow adjustment paths involving intertemporal trade-offs between consumption and investment. These transition dynamics can significantly affect the overall welfare assessment of tariff policies.

This is where the continuous-time optimal control model (Ramsey type) can provide complementary insights. By focusing on a small open economy's optimal response to tariff shocks, the dynamic model reveals how developing countries should optimally adjust their consumption and capital accumulation paths when faced with external tariff changes imposed

by larger trading partners. The model's strength lies in its ability to characterize these optimal adjustment paths mathematically and analyze the intertemporal welfare costs of different policy responses.

The dynamic model's treatment of tariffs as productivity shocks through disrupted global value chains captures a mechanism that is particularly relevant for developing economies but difficult to model in static frameworks. When foreign tariffs reduce domestic productivity through supply chain disruptions, the optimal response involves not just immediate consumption adjustments but also revisions to long-term capital accumulation plans. That model shows that these productivity effects often outweigh any potential benefits from trade balance improvements, leading to the counterintuitive result that retaliatory tariffs may harm the retaliating country more than help it.

The continuous-time framework also provides insights into policy timing and credibility that static models cannot address. The transversality condition ensures that policy responses are dynamically consistent and sustainable over infinite horizons, ruling out policies that might appear beneficial in static analysis but prove unsustainable over time. This perspective suggests that developing countries facing tariff threats should focus on building resilience through diversification and productivity enhancement rather than engaging in tit-for-tat retaliation.

Perhaps most importantly, the dynamic model's welfare analysis incorporates the full intertemporal cost of tariff disruptions. While the static model can analyze the immediate welfare effects through changes in consumer prices and sectoral efficiency, the optimal control framework captures how these immediate costs compound over time through reduced capital formation and lower long-run growth. For developing economies where capital accumulation is crucial for long-term development, these dynamic welfare costs can be substantially larger than static calculations suggest.

The two models together suggest that the policy implications of reciprocal tariffs depend critically on country size and development level. Our model's insights on strategic interactions and exchange rate effects are most relevant for large economies that can influence world prices and possess sophisticated financial markets. The dynamic model's emphasis on productivity effects and optimal adjustment paths is most relevant for smaller, developing economies that are price-takers in world markets but face significant adjustment costs when global trade patterns shift.

Integrating insights from both approaches suggests that optimal policy responses to tariff threats should be differentiated by country characteristics. Large economies might benefit from the kind of strategic tariff and monetary policy coordination our model analyzes, using their market power to improve terms of trade while managing exchange rate effects. Small open economies, by contrast, would benefit more from the resilience-building strategies suggested by the dynamic

model, focusing on productivity enhancement and economic diversification rather than trade retaliation.

The complementary nature of these approaches also highlights the importance of a temporal perspective in trade policy analysis. Short-run effects captured by static models can sometimes point in different directions than the long-run outcomes revealed by dynamic analysis. For a comprehensive policy evaluation, both perspectives are essential—not only to understand where policies lead in the immediate term, but also how economies adapt over time and whether these adaptations support or undermine long-term development objectives.

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