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# An Explanatory Model for Organizational Resilience to Inflationary Processes and Uncertainty in the Era of Tariffs 2025

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Abstract The trade tariff war is producing crisis effects in the markets, based on the information and announcements of tariffs by the US to its trading partners Mexico and Canada, with the possibility of a reciprocal tariff war, the problem is that final prices could skyrocket for all the nations involved, even in the entire value chain. and changes in supply chains, thus increasing inflation. The effect, called the Plaza Agreement 2.0, makes it possible to change investments and resilient organizational strategies, although the final intention is not to raise prices and rates, but as a starting point of advantage in negotiations, in relationships of dependency. The objective of this article is to explain from a mathematical model the capacity of resilience that has caused this turbulence in the market. The methodology used is documentary, financial and organizational research, the result obtained from the model is an optimized resilience with an average equal to 0.5985.

Keywords supply chains, organizational resilience, organizational environment, resilience optimization

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#### Introduction

Canada's exports to the US as a share of GDP are 22% claimed, verified, 19% of Canadian GDP in 2023, (Scotiabank) with exports to the US not being able to be replaced by import substitution (Palazzo, 2024) with the domestic market, from manufactured goods produced in the Mexican municipal market (Jordaan & Garduño-Rivera, 2024), figures may reflect older estimates or broader trade ties (Long et al., 2025). While for Mexico its exports represent 35% stated, with approximately 33% verified (almost a third of Mexico's GDP directly linked to US exports), being the main trading partner for 2024 and affecting Mexico's organizational community and organizational population ecology (Engbring & Hajjar, 2022), and the change in the supply chain strategy for electric car manufacturing (Parés Olguín et al., 2024). Regarding the import-export balance, from the US to Canada it is only 1.4%, for 2023 of 352,760 million dollars, while in the case of Mexico it is only 1.2% which for 2023 was 323,230 million dollars, which implies that both Canada and Mexico depend more on the US than the US on Canada and Mexico. Apparently, the increase in prices based on the inflation hypothesis would occur more because the entity capable of generating inflation is the central bank through the issuance of money and currency (Pokrovskii & Schinckus, 2016), and greater spending than GDP, for which an agency is being created in the government to analyze public spending. While the protectionist idea of tariffs would imply the search to boost national production and reduce the import and export balance in its deficit, for the generation of employment, and in the possibility of price reduction for some goods.

By reducing public spending, as well as the deficit, the need for tax collection can be reduced (Restrepo-Ángel et al., 2022). In 2018, when the tariff policy was promoted, there were three cases where more employment was generated, forcing companies to move part of their production and promoting the manufacture of solar panels, washing machines and steel, which reduced their prices, generating more income for the government.

#### Trifin dilemma

If the amount of oil from one country to another is paid in Dollars, even in cases where none of the countries in the transaction is the United States, as an example the transactions between Russia and the European Union regarding oil transactions. So that there are enough dollars to make the transaction, the United States has to produce and distribute to other countries, which in addition to the transactions, countries usually have dollar reserves, to maintain this system it has to import more than it exports, to force the trade deficit (Haberler, 1976), since if it exported more than it imports the dollars, they would return to the United States in this transaction and there would not be enough currency for the other countries to do business with each other, for this, the United States has to spend more than it earns and produces, even implementing digital forms of sale in the primary sector (Zhang et al., 2023).

If the US continues to have trade deficits, causing a protectionist strategy (H. Ma & Ning, 2024), which could generate distrust in other countries (the basis of the dollar's value is trust, and greater trust in deregulated currencies such as bitcoin in other international markets) (Jabbour & Mansour-Ichrakieh, 2025), and countries could look for other currencies, both to trade their commodities, such as oil, and to increase the value and transactions in currencies that are not directed by any country, such as cryptocurrencies, in which case the dollar would lose value as a reserve currency (Kuehnlenz et al., 2023), and if dollars are no longer required for transactions, demand and value would fall. This would cause a concomitant problem, the power to print currency without control, and spend more than it earns and generates. The US issues treasury bonds, which can be bought and sold between investors and their price on the market and the price can rise, and the profitability can increase from 0.2% to 1.8, but if the dollar loses its value a large number of investors can try to sell their bonds (Herb, 2025), which is like what happens in many bubbles such as the real estate bubble, the .com bubbles or recently those related to AI, particularly with Nvidia, causing resources to go to safe havens such as gold (Grobys, 2025). By losing value due to panic, the new buyer still receives the 2% profitability, but due to the loss of investor confidence, the government would have to raise the interest rate, for example to 5%. The more the interest rate rises, the more the government must pay to service the debt and less for investment and spending on infrastructure and current spending or social security.

If bond prices plummet and the profitability sought by investors rises, debt and deficit become more expensive (Chorafas, 2005), so the government's strategy is to increase tariffs, particularly in the sector and for vehicle producers (Fan et al., 2020) and The Plaza Accord 2.0 strategy (Poole, 1992), the first time in the 1980s several countries signed this agreement because the dollar had become very strong. The effect of the Plaza Accord in September 1985 on the internal monetary policies of Germany, Japan, the United Kingdom and the United States. Monetary policy became much more expansionary in three of the four countries, except for Germany. The efforts of Japan and the United Kingdom to limit the depreciation of the dollar extended the American expansion to these other two countries, inducing a classic cycle in interest rates, economic activity and inflation. Analysis of daily exchange rates and interest rates suggests that market participants failed to grasp the expansionary implications of the Plaza agreement and subsequent policy measures.

American organizations had the problem that their products became more expensive abroad, in the international market and they lost customers, because in the internal market for products and services they had a normal price but not for foreign countries where the foreign exchange market, the goods and consumption markets, and the risks of diversification of portfolio management were involved (Muñoz Mendoza et al., 2024) so with this agreement the value

of the dollar was lowered, to export more competitively. In version 2.0 the tariff variable comes in, the US places it on foreign products to make them more expensive, in a protectionist way and to reduce the trade deficit and balance the scales (Hayo & Mierzwa, 2023) although with the weakening of the dollar, which is good for the US in increasing exports, with the reduced value of the dollar the US can distribute it in the international market without significantly affecting its economy; Trump's strategy is to have a weak dollar in order to be able to sell his products at a profit for the country, however the Federal Reserve, which prefers to raise interest rates to control the rise in prices (Ahmed & Rebucci, 2024), to reduce the demand for loans from both families and organizations, and reduce consumption in the domestic goods and services market, slowing the rise in prices (**Fig 1**).



**Fig. 1** Interest rate hikes following Covid **Source**: Own elaboration based on data from the Federal Reserve.

The graph shows that inflation has been reducing since the rise in rates (Dao et al., 2024). Since the amount of loans from families and organizations has been reduced, the purchase of goods and services in the market is reduced and prices fall in the relationship of supply and demand. The rise in interest rates makes the dollar more attractive to investors in the rest of the world market, which makes U.S. products more expensive outside the U.S., decreasing the organizational competitiveness of their companies in the international market, while in Trump's strategy, there was the interest of lowering interest rates so that organizations could borrow in the financial market. With cheaper credit they could grow more easily. Thus, Trump uses tariffs as a weapon to negotiate with other countries, with a weak dollar, and sell more by pressuring the Federal Reserve to lower rates, which could happen if the Federal Reserve considers that this strategy could avoid a crisis (Rockoff, 2015).

The graph shows that since the rise in rates, inflation has been reduced (Dao et al., 2024). Since the amount of loans from families and organizations has been reduced, the purchase of goods and services in the market is reduced and prices fall in the supply-demand relationship. The rise in interest rates makes the dollar more attractive to investors in the rest of the world market, which makes American products more expensive outside the United States, decreasing the organizational competitiveness of its companies in the international market, while Trump's strategy was interested in lowering interest rates so that organizations could borrow in the financial market, so that with cheaper credit they could grow more easily. Thus, Trump uses tariffs as a weapon to negotiate with other countries, with a weak dollar and sell more, pressuring the Federal Reserve to lower rates, which could happen if the Federal Reserve considers that this strategy could avoid a crisis (Rockoff, 2015).

The effect of conflicts of interest between US agencies implies uncertainty (Albertus et al., 2022); and as a result trade conflicts, volatility, complexity in international relations and supply chains, as well as ambiguity; this has an effect on stocks, the real estate market, and cryptocurrencies (Cong et al., 2023), when money is cheap because interest rates are low, companies borrow and their shares can rise; as in Apple, Tesla, and Nvidia, because their products are cheaper because money is also cheaper and consequently their profits grow, so their shares rise. In the real estate market, there is benefit because mortgages are cheaper, the same happens with bitcoin or gold that become attractive. In the first place Accord a weaker dollar led to lower rates and increases in the markets; complexity consequently becomes an organizational variable for the market of productive factors, that is, in salaries; If exporting organizations generate more profit, they can hire more people with better salaries (Allen, 2021), even increasing foreign direct investment in

other countries with cheaper labor (Dorn & Levell, 2024), as is the case with companies that have part of their manufacturing in Mexico, but the supply chain is complex and depends on the sector (Frenda & Kané, 2025), for example in the case of agriculture and some technology companies where there are more exports; for example in the case of corn to Mexico, or exports of auto parts from Mexico to the US, screens or refrigerators. A weaker dollar would imply that imports would be more expensive, in this sense, for basic products that the US imports from other countries such as clothing, technology, or food, if prices rise faster than salaries, demand loses; the growth of exports does not necessarily compensate for the increase in the cost of living as happens in China (Huang et al., 2021).

#### Volatility, uncertainty, complexity and ambiguity.

A model involving **volatility**, **uncertainty**, and **tariff complexity** (VUC) is presented to assess resilience in a complex system, using the *Monte Carlo* combination and risk-based optimization, to optimize how the system can withstand and recover from Navier Stokes type turbulent system disturbances.

importnumpy as np importscipy. optimize as opt # Parámetros del modelo np.random.seed (42) # Definir el número de simulaciones n\_simulaciones = 10000 # Factores del entorno (valores normalizados entre 0 y 1) volatilidad = np.random.uniform(0, 1, n\_simulaciones) # Cambios bruscos en el entorno **incertidumbre** = np.random.uniform(0, 1, n\_simulaciones) # Falta de predictibilidad aranceles = np.random.uniform (0.05, 0.3, n\_simulaciones) # Aranceles entre 5% y 30% # Peso de cada factor en la resiliencia del sistema pesos = np.array([0.4, 0.3, 0.3])# Cálculo de resiliencia: Cuanto menor sea el impacto, mayor será la resiliencia resiliencia = 1 - (pesos [0] \* volatilidad + pesos [1] \* incertidumbre + pesos [2] \* aranceles) # Función objetivo: Maximizar la resiliencia ajustando estrategias de mitigación (x) defoptimizacion\_resiliencia(x): return -np.mean(resiliencia \* x) # Maximizar resiliencia equivale a minimizar su negativo # Límites de las estrategias de mitigación (entre 0 y 1) bounds = [(0, 1)] \* n\_simulaciones # Optimización para encontrar la mejor estrategia de mitigación x0 = np.ones (n\_simulaciones) # Punto inicial solucion = opt. Minimize (optimizacion resiliencia, x0, bounds=bounds) # Resultados ifsolucion. success: print (f"Resiliencia optimizada promedio: {-solucion.fun:.4f}") else: print ("No se encontró una solución óptima.")

#### Results.

#### Average optimized resilience: 0.5985.

The results presented by the model imply that under our model, the resilience of the system to **volatility**, **uncertainty** and **tariffs** is at a *medium-high level*, so it is necessary to understand the variable of tariff risk.

#### Tariff risk.

The *Trumpflation* variable is due to tariff risk, not inflation. Globalization and technology offer consumers choice in the products they buy, as has been seen, even reducing production and sales costs with domestic production in the host country as has happened in the past with **steel** production. While the institution of a tariff on a set of products from China may increase prices for those specific products, consumers have easy options for substitution (Du et al., 2024). A recent Civic Science survey showed why tariffs will not increase prices based on supply and demand **Fig.2**.



Fig. 2. When you shop for the holidays, you do so because the price is too high. Source: Civic Science 2024.

If demand falls, prices fall due to tariffs, reducing inflationary pressures. If Trump imposes tariffs on Chinese, European and Canadian products, there will be reciprocal tariffs, which slows demand for goods and services in a deflationary process, implying a risk to corporate profitability. Profit margins on the S&P 500 are at historic highs: **Fig. 4** 



**Fig. 4** Unfunded corporate profits as a percentage of GDP vs GDP index growth. **Source:** Real Investment Advice.

Post-pandemic demand increases, supply chain complexity issues, and tax interventions supported elevated margins (Fig. 5), correlation between growth rates and corporate profits.



Fig. 5 Corporate profits as a percentage of GDP and corporate earnings. Source: Real Investment Advice.

With the turbulent economic outlook (Isah & Ekeocha, 2023) internal and external factors of the global complex system particularly in the steel sector, with geopolitical and economic pressures (Maier et al., 2024) can erode profit margins.

In the pandemic, the determining variable was the fiscal stimulus measures in the case of the United States. With this support, they created demand while interest rates reduced borrowing costs (Funke & Terasa, 2022), companies capitalized on supply chain disruptions due to increased costs to consumers with little resistance, currently this agility is due to the digital model in industry 5.0 for sustainable chains (Fernández-Miguel et al., 2024), while in the technology and medical industry there was consolidation with the ability to set prices; with ecological organizational economic characteristics; industry characteristics, composition and stage of consolidation, innovation characteristics and relative profitability, the role of government regulation and innovation of smaller suppliers (Erickson et al., 2022), while labor costs lagged behind inflation (Ahmad et al., 2024), which caused an increase in organizational margins. These variables converge with slowing economic growth, normalized supply chains and moderate inflation, reducing profit margins, and tariff-based risk, for example, in the primary sector where there are effects of tariff reductions on wood products on GDP (Soltanizadeh et al., 2024).

#### Tariff risk on organizational benefits

Corporations adjust their prices to maintain profitability when faced with rising costs, but they can only pass these costs on to consumers if demand remains strong. In 2020 and 2021, consumers accepted these increases due to excess savings driven by government stimulus. However, as those savings dry up, spending declines, lowering inflation and weakening corporate profits as companies lose the ability to pass on the additional costs to customers (Xie et al., 2023). (Fig. 6)



Fig. 6 Annual change in corporate profits versus inflation Source: Real Investment Advice

If a two-year average of organizational profits minus inflation is used, the result is similar: when inflation rose in 2020, organizations placed that cost on consumers; in 2025, as inflation slows due to demand, organizations must absorb inflation to sell products or services. If analyzed from the consumer and producer price index, when inflation increases and demand exceeds supply, organizations place input costs on consumers; when inflation decreases, organizations absorb higher input costs due to the slowdown in demand (**Fig. 7**).





Organizations therefore do not generate inflation (Musarat et al., 2021), but rather react to changes in demand, particularly in the automotive sector (Gallego-García et al., 2019), and adjust prices to maintain profitability, particularly in emerging countries (Alabdullah et al., 2021), and resilience (Duchek, 2020); with uncertain times and unexpected events and possible crises and when the consumer or demand slows down, organizations reduce prices to reduce supply and maintain organizational resilience, especially when there is a turbulent and complex environment (Csedő et al., 2022), multifactorial such as that produced by tariffs, or which represents a particular challenge especially for the survival of SMEs that are in the technology sector, with an ambiguous, volatile, uncertain environment and with a complex and non-linear resilient process (T. Ma et al., 2023).

Markets are focused on risks such as rising labor costs, higher credit costs, and economic slowdown, with tariff risk being a determining variable, but not included in proactive resilient strategies. 41% of S&P 500 organizational revenues come from abroad, a recession in Europe and a slowdown in China could impact the complex organizational productive system and value chains, counterintuitively to the optimistic predictions of the market. **Fig. 8** 



Fig. 8. 41% of profits in S&P 500 organizations come from abroad Source: Torsten Slok APOLLO ACADEMY.

Trump's imposition of tariffs may produce a risk of retaliation, negatively affecting the exports of US organizations. By raising the costs of imported goods and provoking similar responses from other countries, export costs are increased. This is aggravated by a strong dollar, reducing competitiveness in international markets, negatively impacting the profits and stock market value of US organizations.

Given the high corporate revenues derived from international sales, investors should expect any cost increases to immediately impact profitability. **Fig. 9** 



Fig. 9 non-financial corporate net profit margins. Source: Real Investment Advice

Net profit margins have fallen since the Trump tariff period, so the implications for investors are to determine the timing of economic, geopolitical and regulatory changes that will impact markets (Ganiyu Bolawale Omotoye et al., 2024), while measures such as tax cuts have immediate effects, others may take longer. In the current context of turbulent complexity and loosely coupled systems, with high profit margins, slowing growth, increased tariff risk and lower economic expansion, resilient strategies tend to be cautious. **Fig. 10** 



Fig 10 Corporate profits as a percentage of GDP versus employment Source: Real Investment Advice

Notable S&P 500 companies (**Table 1**) show substantial exposure to international revenues. (Note: Revenue percentages from international sales are approximate and based on data available as of 2023. Current P/S and P/E ratios are subject to change based on market conditions and company performance.)

Symbol	Company Name	Intl Sales %	P/S Ratio	P/E Ratio
MA	Mastercard	64	16.2	32.9
V	Visa	62	14.8	30.3
AVGO	Broadcom	61	10.1	39.4
NVDA	NVIDIA	60	28.9	110.2
QCOM	Qualcomm	59	7.4	19.8
AAPL	Apple	58	7.8	32.5
ADBE	Adobe	57	13.4	45.7
TXN	Texas Instruments	56	9.8	22.8
MSFT	Microsoft	55	11	35.8
ORCL	Oracle	54	4.9	21.6
GOOGL	Alphabet	53	5.8	24.7
AMD	Advanced Micro Devices	52	9.3	41.2
TSLA	Tesla	51	11.5	70.4
CSCO	Cisco System	50	5.3	19.4
IBM	IBM	49	2.1	15.6
META	Meta Platforms	48	7.1	28.3
PEP	PepsiCo	47	3.7	26.8
CRM	Salesforce	46	8.2	35.4
AMZN	Amazon	45	3.1	68.5
NFLX	Netflix	44	5.5	43.1
PYPL	PayPal	43	4.3	18.7
INTC	Intel	42	2.7	14.2
КО	Coca-Cola	41	6.5	29.3
COST	Costco	40	1.1	42.2
PG	Procter & Gamble	38	4.4	25.5

Table 1 of companies in the S & P 500 with international revenues

Source S&P 500.

# Organizational resilient strategy.

Mitigate tariff risks (Algarvio, 2023) (Cumming et al., 2022), focusing on utilities, consumer staples, healthcare, with stable demand. Assess trends in key profit margins, with rising costs and slowdowns putting pressure on profitability, hedge against currency risks to counteract dollar strength on exports. Long-term investment, rather than short-term reactivity, as the impact of tariffs creates uncertainty, with real risks and possible market volatility in 2025.

# The effect on supply chains.

Supply chains can be affected by tariffs; growth until 2025 was driven globally by the reduction of trade barriers and free trade. However, uncertainty in trade policies leads complex networked organizations to assume reactive operating strategies (Dong & Kouvelis, 2020), and there is also the impact of non-tariff measures in main global supply countries, which for producing countries with integrated production involve intermediate and final products, implying export and import costs, given the reduction in tariffs, GDP benefits, which has been shown particularly for Vietnam and the Philippines, especially the primary sector, since it is a complex system that is sensitive to starting conditions (Webb et al., 2020), and affects original equipment manufacturers on carrying out remanufacturing operations internally or outsourcing to a third party; the difference between the sales tax on remanufactured products and import tariffs on new products affects the manufacturer's optimal choice; When the difference is close to zero, the decisions of the manufacturer and the importing country are aligned (Webb et al., 2020), while the investment of manufacturing companies in the US responds to the reduction of tariffs in supplier industries, the 10% reduction in tariffs and upstream inputs could increase downstream investment by between 4 and 6%, which is not due to the reduction in

uncertainty but to the reduction in costs of homogeneous inputs and low R&D, as well as competition from Chinese imports drives investment in industries that depend on these inputs (Martin & Otto, 2023).

#### Mathematical model.

A mathematical model is presented to improve *resilience* from volatility, uncertainty and the impact of tariffs.

let *V* be the market volatility, modeled as a random variable in the interval [0,1].

let **U**be the uncertainty, similarly modeled in [0,1].

let *A*be the impacto f tariffs, distributed in the interval [0.05, 0.3].

let  $\omega_V, \omega_U, \omega_A$  be the weights associated with each factor (volatility, uncertainty and tariffs). With values  $\omega_V = 0.4, \omega_U = 0.3, \omega_A = 0.3$ .

#### **Resilience function:**

 $\mathcal{R} = 1 - (\omega_V V + \omega_U U + \omega_A A)....(1)$ 

where  $\mathcal{R}$  represents the resilience of the system, with values between 0 and 1 (the greater the resilience, the lower the negative impact of the factors).

#### **Optimizing resilience:**

We define the objective function as:

 $max \mathbb{E}[R \cdot x] (2)$ 

Where *x* represents mitigation strategies that can be adjusted in the Interval  $\epsilon$ [0, 1]

The optimization problem becomes:

 $\min_{x} - \mathbb{E}[R \cdot x](3)$ 

#### **Restrictions**:

#### $0 \le x \le 1$

This model finds the optimal values of *x* that maximize the resilience of the system.

#### Conclusions.

Two models are presented considering the volatility and turbulence of the market based on ambiguous and complex conditions of the organizational system based on the ecology of organizational population, for this a programming was developed that would use these variables and define an optimum of average optimized resilience: 0.5985, while the mathematical model under the same restrictions of the model, determines that based on the uncertainty produced by the tariffs a specific weight must be placed on each factor, for this the optimization of mitigation strategies can maximize the resilience of the system. Given these results, it is suggested that under the conditions of an uncertain environment and highly susceptible to the starting conditions, volatility occurs, so mitigation strategies play a determining role for the system to be stable over time, understanding the impact of administration and political management on economic resilience.

In future work, more economic variables should be considered, such as interest rates, fiscal policies, to evaluate the risk as a slope variable from these independent variables for a new model, in a systemic way and a long-term strategy optimization model. And finally, they mark a complex effect on the relationship between tariffs and supply chains. Considering that it is required under the idea of nearshoring regardless of the tariffs from point a to point b, and a contingency may occur for which the organizational resilience of the chain system is required (Belhadi et al., 2022), or with respect to climate change (Cao et al., 2024), or wars (Minh Ngoc et al., 2022), or lack of employees (Acquah et al., 2023) to operate cranes, crime in Mexico (Boilevin et al., 2023); the complexity of the supply chain (Bode & Wagner, 2015) the easiest way to build the algorithm is with Dijkstra (Juned et al., 2022), the problem is not always distance, but also the cost (Fernandez-Lacruz et al., 2020); and the other problem is time (Xiong et al., 2023); double objective function problem, reduce the cost and the other is to reduce the time, Pareto frontier, considering that there is a finite and reduced number of customers, to analyze by what means a product will be transported first considering the type of transport, sea, air or land, where there are also restrictions such as the transport of food with oil.

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