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Food Security, Arbitrage and Tariffs

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Abstract

Arbitrage underpins food security. This is best illustrated by examining famines with their roots in natural disruptions to local food production. Such famines were common up until the early 20th century because the infrastructure to take advantage of arbitrage opportunities did not exist. Economic development combined with technical progress in transportation and communications has meant that such famines are no longer manifest. Policy-based barriers to arbitrage, however, such as tariffs still exist. While famine may not be the result of their imposition, the hardships caused by higher prices for food can lead to lower degrees of food security, especially for those with lower incomes.

Keywords: arbitrage, famine, food prices, food security, tariffs, trade

Introduction

At the end of a few days' crawling Scott learned something of the size of the India which he served; and it astonished him. His carts, as you know, were loaded with wheat, millet, and barley, good food needing only a little grinding. But the people to whom he brought the life giving stuffs were rice eaters. They knew how to hull rice in their mortars, but knew nothing of the heavy stone querns of the North, and less of the material that the white man convoyed so laboriously. They clamoured for rice—unhusked paddy, such as they were accustomed to—and, when they found that there was none, broke away weeping from the sides of the carts. What was the use of these strange

hard grains that choked their throats? They would die. And then and there were many of them that kept their word. Others took their allowance, and bartered enough millet to feed a man through a week for a few handfuls of rotten rice saved by some less unfortunate. A few put their shares into the rice mortars, pounded it, and made a paste with foul water; but they were very few. Scott understood dimly that people in the India of the South ate rice, as a rule, but he had spent his service in a grain Province, had seldom seen rice in the blade or the ear, and least of all would have believed that, in time of deadly need, men would die at arm's length of plenty, sooner than touch food they did not know. In vain the interpreters interpreted; in vain his two policemen showed by vigorous pantomime what must be done. The starving crept away to their bark and weeds, grubs, leaves, and clay, and left the open sacks untouched. But sometimes the women laid their phantoms of children at Scott's feet, looking back as they staggered away.

Rudyard Kipling
William the Conqueror, Part II
Selections from the Works of Rudyard Kipling, 1925
pp. 37-38

Month passed into month and still no rain fell. As autumn approached the clouds gathered unwillingly in the sky, small light clouds, and in the village street one could see men standing about, idle and anxious, their faces upturned to the sky, judging closely of this cloud and that, discussing together as to whether any rain held in it. But before sufficient clouds could gather for promise, a bitter wind rose out of the northwest, the acrid wind of the distant desert, and blew the clouds from the sky as one gathers dust from a floor with a broom. And the sky was empty and barren, and the stately sun rose each morning and made its march and set solitary each night. And the moon in its time shone like a lesser sun for clearness.

From his fields Wang Lung reaped scanty harvest of hardy beans, and from his corn field, which he had planted in despair when the rice beds had yellowed and died before ever the plants had been set into the watered field, he plucked short stubby ears with grains scattered here and there. There was not a bean lost in threshing. He set two little boys to sifting the dust of the threshing floor between their fingers after he and the woman had flailed the bean vines, and he shelled the corn upon the floor in the middle room, watching sharply every grain that flew wide. When he would have put the cobs away for fuel, his wife spoke out.

No—do not waste them in burning. I remember when I was a child in Shantung when years like this came, even the cobs we ground and ate. It is better than grass.

When she had spoken they all fell silent, even the children. There was foreboding in these strange brilliant days when the land was failing them. Only the girl child knew no fear. For her there were the mother's two great breasts as yet filled for her needs. But O-lan, giving her suck, muttered.

“Eat. Poor fool—eat, while there is yet that which can be eaten.”

And then, as though there were not enough evil. O-lan was again with child, and her milk dried up, and the frightened house was filled with the sound of a child continually crying for food.

Pearl Buck
The Good Earth
pp. 70-71

Famine, of course, is the complete breakdown of food security (Kerr, 2023a). It is interesting that, to my mind, the two best descriptions of famine are to be found in fiction. Rudyard Kipling’s telling in “William the Conqueror” of a famine in India recounts the desperate efforts of British officials attempting to transport food to a famine blighted area in the absence of adequate transportation. Pearl Buck’s famine precipitates the flight of a family from its famine-stricken village to a place to the “south” where famine is not manifest. Both famines are the result of the failure of local production due to the vicissitudes of weather – crop failures.

Arbitrage

Local crop failures due to drought, pests, frosts, floods and other natural disasters occur all the time in both developing countries and developed countries (Kerr, 2023a). There is little that can be done to avert them. Of course, there are other sources of disruptions to local food production such as civil strife and wars that can precipitate famines and flows of refugees seeking food and safety. In the case of natural disasters, in the normal course of events as local food supplies dwindle local food prices rise relative to areas not affected by food disruptions, be they the next village, distant districts or foreign countries. The rise in relative prices creates the opportunity for profit from moving food from where it is relatively abundant to where it is relatively scarce – of course taking account of the cost of transportation. Where good transportation infrastructure and communications exist, the incentive provided by potential profit leads to the opportunity for arbitrage to be capitalized upon.

In modern market economies local food production failures are commonplace – but local consumers hardly notice. Modern supermarkets and their supporting supply chains are extremely adept at acting upon arbitrage opportunities. A local lettuce crop failure spurs produce buyers to search out alternative sources of lettuce which seamlessly fill in the local hole in the market. Even if it is difficult to obtain fresh lettuce, substitutes can be brought into play. While a local consumer may wonder why their favourite type or brand of lettuce may not be on the shelf, concern for food security never enters their

mind. It is when there is not adequate infrastructure that opportunities for arbitrage cannot be taken advantage of.

Both Kipling and Buck were writing at a time when infrastructure in India and China was poorly developed. As a result, famines were common and a topic of interest both to the authors and their audiences. Pearl Buck's book – *The Good Earth* – won a Pulitzer Prize in 1932.¹ Famines in India and China are no longer common occurrences. Infrastructure has improved to the point where food can be moved to areas where local crop failures occur. According to Burgess and Donaldson (2010, p. 453):

The results of our analysis suggest that rainfall shortages had large effects on famine intensity in an average district before it was penetrated by India's expanding railroad network. But the ability of rainfall shortages to cause famine disappeared almost completely after the arrival of railroads.

A similar result has also been found for China. According to Todd (1924: pp. 6-7):

The famine of 1920-21 proved the benefits of rapid rail transportation. Train loads of grain were shipped down from Manchuria into the affected provinces near the Yellow River and saved most of those who were on the border of starvation. Under similar famine conditions in 1878 thousands perished because there was no way to get food in from distant points on time.

Allowing arbitrage to work is clearly the key to reducing the severity of famine, if not eliminating it. This is not a new idea as it dates back at least to Adam Smith (1776, IV, 5):

In rice countries, where the crop not only requires a very moist soil, but where, in a certain period of its growing, it must be laid under water, the effects of a drought are much more dismal. Even in such countries, however, the drought is, perhaps, scarce ever so universal as necessarily to occasion a famine, if the government would allow a free trade. The drought in Bengal, a few years ago, might probably have occasioned a very great dearth. Some improper regulations, some injudicious restraints, imposed by the servants of the East India Company upon the rice trade, contributed, perhaps, to turn that dearth into a famine.

Given that arbitrated trade flows – domestic or international – are well known theoretically, empirically and through experience it is somewhat unfathomable that alternative strategies purporting enhance food security are so often still advocated. In particular, policies aimed at achieving local self-sufficiency or increasing local sourcing of food. To achieve the goals of increased levels of locally sourced food requires putting in place restrictions on inbound food supplies – that is denying the opportunities of arbitrage.²

There can be dynamic consequences arising from reducing the incentives to engage in arbitrage. For example, if food is not allowed to flow into areas which could benefit from arbitrage, then the infrastructure required to move food may not be built – railroads, roads, storage, distribution systems. It could even lead to the phenomenon portrayed by Kipling in the quote that started this paper whereby consumers are so unfamiliar with non-local foodstuffs that they will not eat them and/or do not know how to prepare them. Even in the case where famine is not a threat, if there is a disruption in local, but familiar, food production, prices will rise leaving local consumers less well off than they could be. As observed in modern market economies, foods from other cultures are widely adopted over time if they are available – in North America for example pizza, tacos, pho, dim sum and sushi were almost unknown a hundred years ago but are now deeply integrated into local food cultures.

Those who dispute that benefits that arise from arbitrage often do so on the basis of how long it takes to respond to the price rises associated with a disruption on local food supplies. They are correct that there will be a lag in the response (Nakuja and Kerr, 2018). The length of the lag, however, is often exacerbated by the lack of infrastructure precipitated by fostering *local* self-sufficiency and poor communications infrastructure so that the opportunities for arbitrage are obscured.³ Such lags can lead to hardship and hunger. Lags, however, can be anticipated and dealt with more efficiently through policies incentivizing storage rather than encouraging self-sufficiency (Nakuja and Kerr, 2019).

The problem with policies that encourage self-sufficiency and reliance on local production is that disruptions to local food production cannot be prevented. Variations in weather patterns do and will occur – and may be becoming more prevalent and extreme due to climate change (Kerr and Clark, 2022). Other sources of disruption – wars, civil strife, labour disruptions, disease cannot be ruled out – even in what appear to be stable countries. Who could have imagined a war-torn Ukraine in 2010 (Antonyuk and Kerr, 2005). Who could have anticipated the famine wrought by the *Great Leap Forward* policies in Mao's China (Bernstein, 2006). Who could have predicted the effects of Covid on, for example, the labour supply in US meat packing plants (Kerr, 2020; Hobbs 2020) or the lock down in China (Zhang, Luo and Zhu, 2021).

There may be lots of good reasons for policies promoting locally sourced food and expanding its production – and consumption – i.e. supporting local farmers, reducing carbon footprints, fresher food, reducing the influence of large agribusinesses in diets and supply chains, less processed foods, etc. – but not food security. Of course, famines are extreme examples of the inability to take advantage of arbitrage opportunities and, at least in terms of transportation infrastructure, have largely been solved through the

process of economic growth and technological improvements over the last century (Kerr, 2023a). Famines in the current time are primarily the result of human actions (Kerr, 2023a). Natural-based famines have faded from memory and are no longer a topic of interest in popular culture. One does not find authors of the stature of Rudyard Kipling or Pearl Buck – clearly icons of their eras – writing today about natural-based famines.

Tariffs

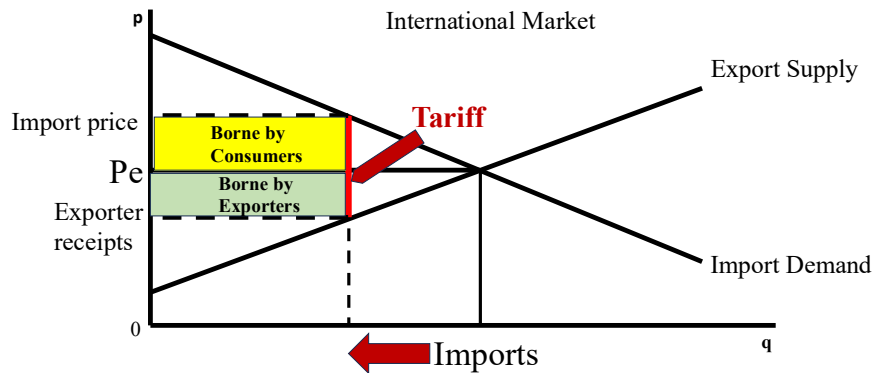
While arbitrage has largely removed the threat of famine arising from local weather or other natural disasters, local disruptions still occur. Their effects are largely in the realm of price increases. Increases in prices can reduce food security, especially among those with low incomes. Rising prices increase the likelihood of food insecurity being manifest for segments of the population. A family gazing at a supermarket full of food but do not have the income (or other resources) to enter and purchase their food requirements is not food secure. Food banks and programs such as the SNAP subsidies – formerly food stamps – in the US recognize food price related hardships. If nothing else, for those with low incomes, rising food prices force hard choices on how to allocate one's budget between food and other consumption lines such as rent, energy, transportation, entertainment and education.⁴

As with famines, restrictions on the ability to arbitrage contribute to higher food prices and the hardships such as hunger and declines in nutrition levels that are associated with them. In the international context tariffs are a restriction of the ability to arbitrage difference in international prices of food. Tariffs, however, are a contentious issue with the effect on food prices in the importing country dependent upon the *incidence of tax* (Kerr, 2025). The question of the incidence of tax is illustrated in Figure 1.

Relative to a market equilibrium which is unfettered by a tariff (e.g. at P_c where the export supply and import demand functions intersect) a tariff imposes a wedge between the export supply and import demand functions – leading to the import price and the export price to diverging. Relative to P_c , the rise in the import price is borne by consumers in the importing country. The decline in the export price relative to P_c is borne by the exporters. Where the burdens of the tax fall depends on the slopes of the import demand and export supply functions (Kerr, 2025). Thus, who bears the incidence of the tariff is an empirical question. In the absence of empirical estimation, a case can easily be constructed whereby the shapes of the import demand and export supply functions can lead to the conclusion that almost all of the tariff's effect will be borne by

the exporter (Kerr, 2025). This implies that consumer price increases in the imported country are small. As a result, there is little impact on food security.

Figure 1: Incidence of Tax – Who Bears the Cost of a Tariff?



For example, this is the contention of President Trump and members of his administration – that tariffs that are being impose on US imports are not inflationary. It is foreigners that *pay the tariff*. Of course, this view of tariffs is hotly debated given the absence of empirical estimates – which are difficult to do (Kerr, 2025). President Trump sees the value in tariffs as weapons that can be used for *thuggery* in aid of achieving foreign policy goals. Angst among the American public over food prices, however, has forced the Trump administration to back down and remove some tariffs on food. For example, on November 14, 2025 CBS News reported:

President Trump exempted foods like beef, coffee and bananas from his sweeping country-by-country tariffs on Friday, as his administration grapples with cost-of-living frustrations and quickly rising prices for some types of food.

The new exemption covers a range of tropical products that are often imported to the United States, including coffee, tea, bananas, mangoes, avocados, coconuts, pineapples, cocoa and spices such as nutmeg, according to an executive order. It also covers beef, oranges and tomatoes (Walsh, Nov 14, 2025).

President Trump admitted that some tariffs would increase food prices. According to CBC News, November 14, 2025:

"They may in some cases" raise prices, Trump said of his tariffs, when asked about the move aboard Air Force One on Friday evening. But he insisted that overall, the U.S. has "virtually no inflation." (Shalal, 2025).

While there may not be a *crisis* in the United States regarding food prices (*The Economist*, January 3, 2026), angst over food prices exists and appears to have a political aspect that is difficult to ignore. Those on low incomes will find their food security deteriorating but even among those who do not think in terms of food security, food price increases are a concern. Imposing frictions that exacerbate increases in food prices by restricting the ability to take advantage of opportunities to arbitrage seems folly on historical reflection. Famine is not the result in this case, but rising food prices cause hardship and a deterioration in food security for some (Kerr, 2025). Progress on the issue of restrictions on agricultural trade has been stalled for more than two decades at, for example, the World Trade Organization (Kerr 2023b). There appears little likelihood that these long-standing inhibitors of arbitrage opportunities will be removed.

Conclusions

There is no better way to provide a focus on the benefits of arbitrage than to reflect on the commonplace famines of the past. While what precipitated such crisis in the past were disruptions to local food production, it was the inability to take advantage of arbitrage possibilities that brought about the specter of famine. Famines are an extreme, but that does not mean that restrictions on the ability to engage in arbitrage opportunities, do not lead to hardship. While not in all cases, the imposition of artificial barriers to arbitrage such as tariffs leads to negative effects on food security. In the absence of solid empirical evidence, caution should be the byword for their use. The benefits of removing trade restrictions on food trade are as clear as they have ever been. It is disturbing that policy makers ignore the lessons of history. The Rudyard Kiplings and the Pearl Bucks of the world did not.

References

- Antonyuk, O.V. and W.A. Kerr (2005) Meeting TRIPS Commitments in Ukraine: An Important Challenge in the Quest for WTO Accession, *Journal of World Intellectual Property*, 8 (3): 271-282.
- Bernstein, T.P. (2006) Mao Zedong and the Famine of 1959-1960: A Study in Willfulness, *The China Quarterly*, 186: 421-445.
- Buck, P.S. (1931) *The Good Earth* (New York: Simon and Shuster).

- Burgess, R. and D. Donaldson (2010) Can Openness Mitigate the Effects of Weather Shocks? Evidence from India's Famine Era, *American Economic Review: Papers and Proceedings* 100: 449-453.
- Fake Blues (2026) *The Economist*, Jan 3: 13-15.
- Hobbs, J.E. (2020) Food Supply Chains During the COVID-19 Pandemic. *Canadian Journal of Agricultural Economics Special Issue*, 68 (2):171-176.
- Kerr, W.A. (2025) Why Has It Been So Difficult to Provide Assessments of New Tariffs?, *Journal of International Law and Trade Policy* 26 (2): 79=89.
- Kerr, W.A. (2023a) Food Security – Availability, Adequate Income and Productivity (Cheltenham: Edward Elgar).
- Kerr, W.A. (2023b) Becalmed – The World Trade Organization at Not Yet Thirty, *Journal of International Law and Trade Policy* 24 (2): 50-62.
- Kerr, W.A. (2020) The Covid-19 Pandemic and Agriculture – Short and Long Run Implications for International Trade Relations, *Canadian Journal of Agricultural Economics, Special Issue*, 68 (2): 180-190.
- Kerr, W.A. and L.F. Clark (2022) Are Geographical Indications Sustainable in the Face of Climate Change? *Queen Mary Journal of Intellectual Property*, 12 (2): 226-241.
- Kipling, R. (1925) William the Conqueror, Part II, Selections from the Works of Rudyard Kipling (London: MacMillan and Co., Limited)
- Nakuja, T. and W.A. Kerr (2019) International Trade and Food Security: Can Public Stockholdings Be Dismissed?, *International Journal of Food and Agricultural Economics*, 7 (2): 91-106.
- Nakuja, T. and W.A. Kerr (2018) Food Security Though Public Stockholdings and Trade Distortions, *British Food Journal*, 120 (5): 1089-1105.
- Shalal, A. (2025) Trump Cuts Tariffs on Beef, Coffee and Other Foods as Inflation Concerns Mount, *CBC News*, November 14, 2025: <https://www.cbc.ca/news/world/trump-tariff-changes-agricultural-products-9.6979743>.
- Smith, A. (1776) *An Inquiry into the Nature and Causes of the Wealth of Nations*, The Project Gutenberg, 2025, <https://www.gutenberg.org/cache/epub/3300/pg3300-images.html#chap30>.
- Todd, O.J. (1924) American Engineers in the China Field, *The Military Engineer* 16 (85): 1-10.
- Walsh, J. (2025) Trump Cuts Tariffs on Beef, Coffee, Bananas and Other Food Imports, *CBS News*, Nov 14, 2025: <https://www.cbsnews.com/news/trump-cuts-tariffs-beef-coffee-bananas-and-other-food-imports/>
- Zhang, X., W. Luo and J. Zhu (2021) Top-Down and Bottom-Up Lockdown: Evidence from COVID-19 Prevention and Control in China, *Journal of Chinese Political Science*, 26: 189-211.

Endnotes

¹ Pearl Buck also received a Nobel Prize in Literature in 1938.

² The goals can also be achieved though subsidies that nullify the benefits of arbitrage.

³ The rapid and low cost global availability of cell phones has greatly enhanced the spread of price information over the last two decades.

⁴ One suspects that access to social media has become an additional *necessity* for many consumers adding another category among which budget choices must be made.