

Fall 2024 Issue



Penn Economics Almanac

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EDITORS' NOTE

Welcome to the **Penn Economics Almanac**, an attempt to make economics accessible and interesting.

Economics might be confusing, but not because it needs to be—nor because you need a PhD to decipher the economy's impact on your day to day life. Economics is confusing because the language we use to talk about the economy is anything but inclusive. It's heavy in jargon and all too often the people who claim knowledge do their best to raise—rather than lower—the barrier to entry in economic discussions. As a result, a lot of the voices that should be heard don't feel comfortable enough speaking.

The Almanac is a forum for college students to write and for college students to read. Every semester, we'll publish pieces written by you: college students. In return, we hope you'll try reading something you might not have yesterday. The Almanac is not a forum for economics to be dumbed down. Rather, it's an opportunity to open up economic discussions to new voices, as we believe college students are more than capable of adding to discussions.

Our inaugural edition includes a compilation of pieces our staff writers wrote last semester. You'll find explorations of geopolitics: one article on Somaliland, Ethiopia, and the overlooked importance of ports, and two more discussing economic dimensions of US-China relations. You'll find forays into economic theory, investigating questions about the compatibility of growth with environmental sustainability and the insights of Smith and Ricardo into contemporary markets. Finally, you'll find an interview with Penn's own Dr. Francis Diebold, chair of University of Pennsylvania's Economics department, that touches on everything from economic modelling to applications of machine learning to climate change. And hopefully, if we did our job right, you'll find articles, interviews, and columns that make you feel a little more excited to read about the economy again tomorrow.

Mo Foroutan Nasab
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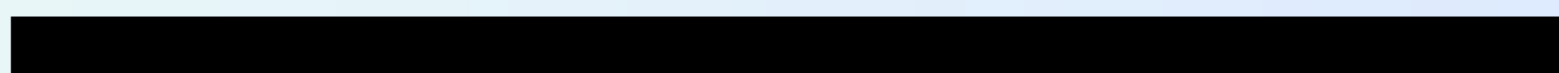
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ECONOMIC EFFECTS OF ETHIOPIA-SOMALILAND PORT DEAL

BY JAZZ CH’NG

Ethiopia shook the Horn of Africa in January by announcing a memorandum of understanding with the unrecognized breakaway state of Somaliland. In exchange for access to Somaliland’s Berbera port and a 50-year lease on 12 miles of nearby coastline, Ethiopia would offer shares in its state-owned Ethiopian Airlines and, more importantly, become the first U.N. member state to recognize Somaliland’s independence (Taiwan, a non-member, recognized Somaliland just last year).

The deal stirred immediate outrage in Somalia, Ethiopia’s eastern neighbor, which claims Somaliland as a wayward province despite its de facto independence since 1991. Somalia recalled its ambassador to Ethiopia, protests raged in the Somali capital city Mogadishu, and the country’s president signed a bill symbolically nullifying the deal, warning Ethiopia “don’t do it.”¹ Egypt, Turkey, Djibouti, Eritrea, China, the U.S., U.K., E.U., African Union, Organisation of Islamic Cooperation, Intergovernmental Authority on Development, and even powerful Somali terrorist group al-Shabaab have either condemned or urged Ethiopia not to proceed with the deal, which Somalia branded a violation of its sovereignty.²

This diverse and unsurprising condemnation begs the question of why Ethiopia—which recently concluded a devastating 2-year conflict in Tigray—would risk such backlash all to use a foreign port.³

The State of Play

Ethiopia is bordered to the north by Eritrea, Djibouti, and the unrecognized breakaway state of Somaliland, internationally recognized as part of Ethiopia’s eastern neighbor Somalia. To access the Red Sea, Gulf of Aden, or Indian Ocean, landlocked Ethiopia would have to negotiate with—or invade—one of those four polities.

Ethiopia’s relationships with Eritrea and Somalia are generally poor. It has waged war with both countries in the past, including a bloody 30-year independence conflict that saw Eritrea secede from Ethiopia in 1991, taking the country’s only coastline and ports with it. Somalia’s brief invasion of Ethiopia in 1977 led to its own civil war in which Ethiopia backed the Somali National Movement. The result: Somaliland’s declaration of independence in 1991.⁴

Given these less than amicable histories, Ethiopia has relied on the tiny Republic of Djibouti—a nation approximately the size of New Jersey—for 95% of its inbound and outbound trade, a privilege for which it pays between \$1.5 billion and \$2 billion USD annually, or about 1.6% of its GDP.⁵ Though Ethiopian Prime Minister Abiy Ahmed has expressed no discontent toward Djibouti, the present arrangement

constrains Ethiopia both logistically and financially, resulting in 2022 Djiboutian import volume cuts of 15% as Ethiopia redirected traffic to other ports.⁶

Logistical Limitations

The 95% of Ethiopian trade that flows through Djibouti enters a single foreign port, presenting a clear economic and logistical challenge. Landlocked countries already incur higher trading costs from both the extended overland transport to seaports and passage costs of entering transit countries.⁷ Ethiopia faces the additional bottleneck of near-complete reliance on one port: every import and export must first pass through Djibouti, then the Addis Ababa-Djibouti corridor that connects Djibouti to central Ethiopia, and finally the country’s rugged mountains, rivers, gorges, and valleys.⁸

The 470 mile Addis-Djibouti rail and road corridor connects Ethiopia’s capital and largest city Addis Ababa to major inland port Adama, commercial center Dire Dawa, and Djiboutian border crossing Dewele.⁹ Until 2016, this critical route was served only by the unmaintained, century-old Ethio-Djibouti Railway, which deteriorated to the point it was superseded by slower, inefficient road transportation, the cost of which rendered Ethiopian exports uncompetitive and spiked import prices 21%, far higher than the regional average of 13.8%.¹⁰

Only in 2016 was the route finally modernized with the construction of the 45-station electrified Addis Ababa-Djibouti Railway, under which freight volumes have grown 22% annually, refrigerated facilities have enabled expansion of key agricultural exports, and freight times have fallen from 50 hours to 10.¹¹ Though a boon for Ethiopia and Djibouti, the new railway is no panacea: out of a maximum 120 km/h speed, it only averages 55 km/h due to collisions with cattle and attacks by ethnic militias.¹² Tickets are more expensive and stops fewer and farther from cities. Between the 30% of the line that connects Dire Dawa to Dewele, locals find the old Ethio-Djibouti line more useful.¹³ The accompanying road



section from Mieso to Dire Dawa received World Bank funding just last year,¹⁴ but neither the new nor old routes reach Ethiopia’s manufacturing centers, which are largely to the west of the capital.¹⁵

The lack of connective transportation has been a particular point of failure for the government’s efforts to grow the Ethiopian manufacturing sector, which comprises 27% of GDP but only 15% of exports.¹⁶ Starting in 2010, the Ethiopian government has tried to pivot away from the agricultural sector (currently comprising half of the national GDP and 85% of employment) and toward the faster-growing and more competitive manufacturing sector.¹⁷ Despite this attempt, the Djiboutian bottleneck has precluded Ethiopia’s full adoption of the export-oriented industrialization scheme that was utilized to great effect by the Asian Tiger and Tiger Cub Economies.¹⁸

Financial Limitations

Transportation logistics challenges also have financial repercussions that extend beyond Ethiopia’s annual billion dollar port fee. Since 1974, Ethiopia has run a strong trade deficit.¹⁹ Despite primarily exporting agricultural commodities, the landlocked nation is a net importer of food and fuel.²⁰ This persistent imbalance has contributed to the country’s perennial foreign exchange (forex) shortage, as it must pay for imports in foreign currency but acquires limited foreign currency from exports. This deficit has been worsened by the COVID-19 pandemic and Tigray War, both of which raised public expenditures and cut off forex earnings from tourism. The latter also saw the U.S. revoke duty-free trade access and international donors cut foreign aid over reports of rights violations, further restricting Ethiopia’s access to foreign currency.²¹ The war also delayed the rollout of investor-awaited trade and financial liberalization measures, and Ethiopia defaulted on its international debt late last year, about half of which—\$14 billion—is owed to China. Of that sum, 17% is attributable to the cost of the Addis Ababa-Djibouti Railway built under the Belt and Road Initiative.^{22, 23}

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The private sector is particularly limited by the strict currency controls the National Bank of Ethiopia (NBE), the country’s central bank, imposes on its currency, the birr, which is non-convertible and trades at both an official exchange rate set by the NBE (about 55 birr/USD) and an unofficial black market rate twice as high (110 birr/USD).²⁴ Though the NBE has attempted to devalue the birr to promote exports and discourage imports, demand for foreign currency continues to outstrip supply, which the NBE itself controls. The bank allocates foreign currency to the private sector, prioritizing the country’s international debts and state-owned enterprises above a ranked list of private sector industries. The shortage is such that it can take businesses a year or more to receive foreign currency allocations.^{25, 26}

NBE Priority	Categories
1	Pharmaceuticals: Medicine and laboratory reagents
2	Inputs for Agriculture: Fertilizer, Seed, Pesticide and Chemical Inputs for Manufacturing: Raw material and Chemical
3	Motor oil, lubricants and LGP gas

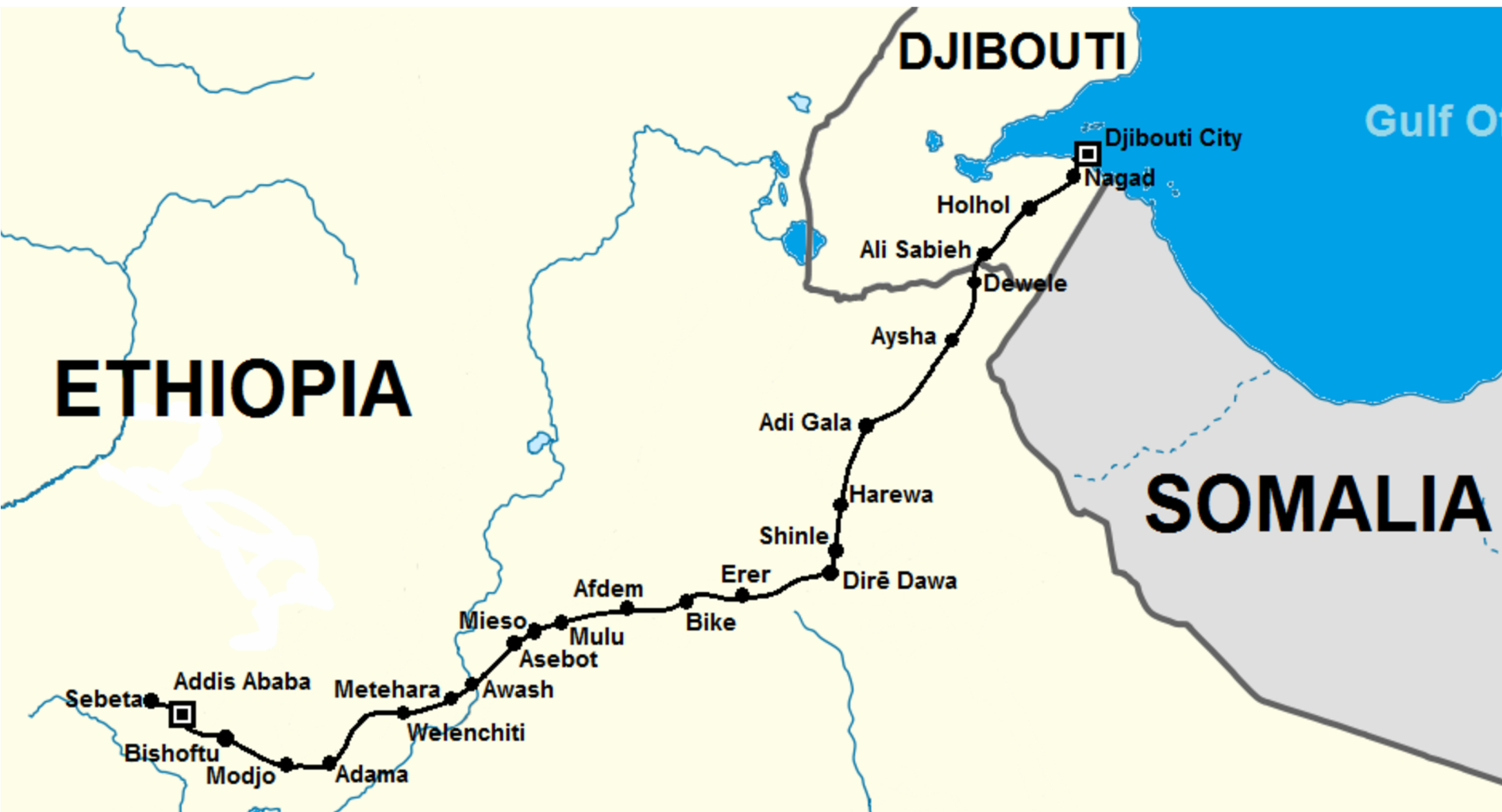
In 2013, the Djiboutian government threatened to freeze all Ethiopia-bound cargo unless businesses could prove payment had already been transferred (Ethiopian firms had previously been allowed to pay up to two weeks afterward). The move came after Djiboutian shippers complained about repeated late payments by their Ethiopian counterparts, who themselves blamed delays by the NBE.²⁷ The Djiboutian ultimatum successfully forced Ethiopian ministers to push businesses to pay more quickly, though complaints about the NBE continue.²⁸

Maritime Ethiopia

Ethiopia’s landlocked status has significant knock-on effects for its economic health and development, industrialization, trade, and balance of payments status (Ethiopia’s perpetual foreign exchange shortage and the high cost of imports contribute to its persistent double-digit inflation).²⁹ Greater ocean access could allow the country to realize its economic potential, fully industrialize, balance its trade deficit, secure foreign currency, curb inflation, and shore up public finances. Thus the economic argument for an Ethiopian port—or, more realistically, better access to foreign ports—is clear.

But Abiy has also cited political and historical justifications for a port: the Aksumite Empire, an ancestor to modern Ethiopia and Eritrea, thrived two millennia ago because it controlled the Red Sea, and the Ethiopian Empire that succeeded it was similarly a maritime nation.^{30, 31} Many Ethiopian nationalists still resent the loss of Eritrea, which took with it the storied ports of Massawa and Assab. Ethiopia’s border conflicts with Eritrea and Somalia have been motivated by the former’s “exorbitant” export fees and frictions between Ethiopia’s Ogaden hinterland and the Somali Indian Ocean ports that export its products, including the lucrative 2022 finding of 7 trillion cubic feet of natural gas.^{32, 33}

Ethiopia has also long sought to reestablish an oceangoing navy, fearing both interventions by numerous great powers with Djiboutian naval bases as well as general disorder in the Red Sea.³⁴



Economically, it has cultivated alternatives in Kenya’s Lamu Port and Sudan’s Port Sudan, though the former has been delayed by a financing shortage and the latter by Sudan’s coups and civil war.³⁵ Ethiopia and Eritrea, in a 2018 rapprochement that earned Abiy a Nobel Prize, agreed to move toward reopening Ethiopian access to Eritrean ports, but that deal has been all but scuttled by disagreements over the resolution of the Tigray War and Eritrea’s concern over Abiy’s aggressive rhetoric about Ethiopia’s right to the sea.³⁶

The Port of Berbera

With Kenya, Sudan, Eritrea, and Somalia nonviable as potential foreign ports, Somaliland seems Ethiopia’s most realistic option. Friendly bilateral relations between the two nations stretch back to the 1980s, when Ethiopia sheltered the Somali National Movement fighters who would later form Somaliland. And unsurprisingly, economic simulations have shown that bilateral cooperation between landlocked and coastal states can better maximize economic benefits for both.^{37, 38}

Berbera, like Djibouti, is to Somalia’s east, so some existing shipping infrastructure could still be utilized. Ethiopia has also been using Berbera since 2005, with 5% of imports passing through that port in 2022 and a road already under construction. Though the port is farther than Djibouti, it is cheaper and the discount in port costs—up to 20% in some cases—could make Ethiopian exports more competitive.³⁹ For dry bulk freight such as fertilizer—a key Ethiopian import—differences in shipping rates between Djibouti and Berbera are negligible.

Disregarding time and congestion, a 2021 study found Djibouti was still the optimal port for Ethiopia. Owing to its geography, road and rail infrastructure, low container transport costs, and high liner shipping connectivity, Djibouti’s total logistics importing cost was less than half that of potential alternative Port Sudan. Accounting for the sheer size of Ethiopia, however, the study concluded other ports close to the country’s economic centers, such as Berbera, should also be pursued.⁴⁰

Abiy’s Ambition

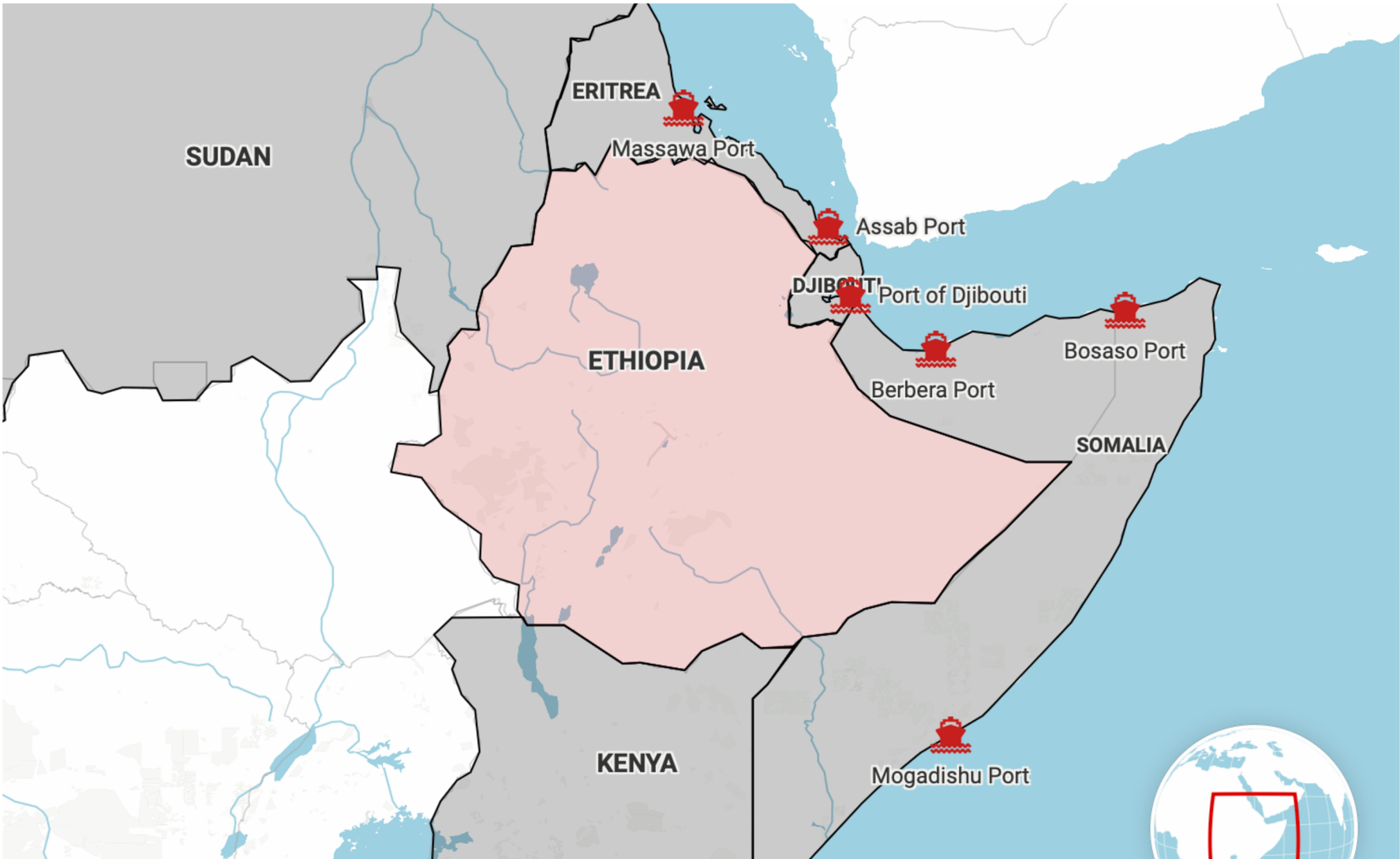
Ethiopia’s port pursuit under Abiy should not surprise anyone. In October 2023, the prime minister declared that Ethiopia—Africa’s second most populous nation and a regional power—had a practical and historical right to escape its “geographical prison” and reclaim the Red Sea as its “natural boundary.” Despite claiming to seek a diplomatic solution, only days later he accompanied a military parade through the capital as Ethiopia’s air force chief warned soldiers to prepare for war.⁴¹

Six months later, there has been no war. Somalia, despite promising to do “everything it can to defend itself,” has not expelled or restricted the 3,000 Ethiopian A.U. peacekeepers stationed within its borders. Abiy has continued to describe ocean access as an “existential issue” for Ethiopia, while simultaneously proclaiming Ethiopia and Somalia as “bound by blood” and a “profound” friendship.⁴³

Both the prime minister’s allies and enemies have described his inconsistent bellicosity and historical claims as a mere domestic play, providing a useful political distraction from his country’s economic woes.

The move appeals to Ethiopian nationalists as well as the ethnic Amhara militias Abiy alienated in 2022. The prime minister has previously floated negotiations for access to other Eritrean or Somaliland ports, but is described as “notoriously unpredictable.”⁴⁴

One theory posits that Abiy wishes to secure his legacy by restoring Ethiopian greatness through the sea—an imperfect parallel to Russia’s quest for a warm water port and Vladimir Putin’s designs on Ukraine.⁴⁵ Regardless of the theory’s correctness, connecting Ethiopia to the sea—though no panacea for its national woes—would likely earn Abiy a commanding place in his country’s history alongside great emperors of the past: Zara Yaqob, Menelik II, and Haile Selassie.⁴⁶ Such is the importance of the sea to Ethiopia, and such is the importance of the economics of Ethiopia, Berbera, and the sea.



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THE CRYPTO DRAGON

Could China Establish a Digital Dynasty Over the Dollar?

BY TOMMY ZHENG

Though the US dollar is still comfortably the global fiat currency, China’s new digital currency could pose a serious threat as the 21st century unfolds. With the growing de-dollarization of the global economy, the digital yuan could allow China to leverage its position as the main trading partner of more than 150 countries in order to expand Chinese monetary influence. Due to the present dominance the US dollar in global markets, even a limited international switch towards the digital yuan could significantly impact the dollar’s sway over international payments.

China’s 13th Five-Year Plan for Economic and Social Development promotes the expanded use of the yuan (or RMB) internationally. Its main motivation is to challenge US’ tight monetary policies and potentially expand RMB use as a reserve currency for global financial transactions. However, the internationalization of the Yuan outlined in the Thirteenth Plan is still extremely ambitious considering the RMB share in global reserve portfolios sits at only 3% (compared to 60% for the US dollar).¹ Though China only barely lags behind the US in terms of pure macroeconomic indicators like GDP and trade volume, the yuan has struggled as a dominant reserve currency due to China’s political untrustworthiness and state-controlled economy. The introduction of the digital Yuan could potentially change this dynamic.

The digital yuan has multiple potential selling points that could be leveraged against the dollar, including its programmability and potential for easy cross-border transactions. These features distinguish the digital currency from both cryptocurrencies and also traditional fiat currencies, potentially enhancing its attractiveness to global investors and businesses.² Despite the high ceiling of the digital yuan, China still faces potentially

insurmountable challenges in convincing international markets of the currency's stability. Ultimately, the success of the digital yuan in challenging the dollar's dominance will still depend on China's ability to address the underlying uncertainty surrounding its political governance, economic transparency, and regulatory stability.

Though the pilot of the digital yuan began during the pandemic, early adoption rates were discouraging as consumers hesitated to abandon existing digital payment platforms like WeChat pay and Alipay. Despite this slow rollout, the Chinese government is poised to forcefully insert the eRMB into its economy and has vigorously pursued its goals of increasing the influence of its new digital currency. President Xi has recently announced to the Shanghai Cooperation Organization to expand the influence of the Chinese digital yuan. And at the 2022 Beijing Winter Olympics, the Chinese government gave visitors the option to exchange foreign currencies for the yuan, challenging Visa as the sole processor at the Olympics.³ Having already banned the usage of cryptocurrency in 2021, competition in the digital currency sphere is limited.

Many experts argue that China doesn’t actually want the yuan to replace the dollar as the world’s reserve currency, citing that China can’t afford to run a deficit and doesn’t want to liberalize their economy. However, the introduction of the digital yuan resolves many of these concerns. The digital yuan assuages the concerns of deficits and liberalization by allowing China to control the rails and sit back to collect the data while others use the currency to make transactions. Since the currency and transactions are all digitized, it gives China the option to keep its data away from private businesses and its global competitors.

Recent reports by the Deutsche Bank argued that “geopolitics have prompted a re-evaluation of the current international financial system, and some countries may position Central Bank Digital Currencies (CBDC) as a soft power tool – potentially upsetting the dominance of the US dollar and SWIFT.” As the battle for currency hegemony continues, China is willing to employ its geopolitical power to push its digital currency to the top. One of the ways China could leverage geopolitics is through the Belt and Road Initiative (BRI) —Xi JinPing’s global policy project that has projected spending of more than 2 trillion dollars. The initiative has global influence, reaching over 60 countries that comprise two-thirds of the world’s population.⁴ Though many Western countries criticize the initiative as a debt trap, China has generated more than 230 cooperative international agreements under the BRI alone. China can use loans agreed upon through such initiatives to promote the digital yuan internationally by signing these contracts denominated in the eRMB with foreign lenders.

Due to political reasons and high US interest rates, some countries have started to turn towards the yuan. By September 2023, its share of global payments rose to 3.71%. Although still far from the dollar’s 46.6% share, the introduction of the digital yuan could potentially

internationalize the RMB.⁵ In many developing countries, transactions with other countries are expensive and time-consuming. However, since eRMB is a Central Bank Digital Currency (CBDC) that doesn’t rely on the blockchain, it bypasses third-party institutions, which eliminates external fees while executing transactions almost instantly. Although digital yuan transactions are not on the blockchain, it still allows user countries to avoid censorship or sanctions by the US. Many countries want independence from the Society for Worldwide Interbank Financial Telecommunication network (SWIFT). SWIFT is a global network that connects thousands of financial institutions in hundreds of countries. Since its inception, the US has forced countries under SWIFT to abide by its sanctions. The BRI complements the promotion of the digital yuan as it can slowly change dollar-denominated trades into renminbi-denominated ones. Although this process will not happen overnight, it is conceivable that a Chinese backed financial system that allows countries to bypass banking systems and US sanctions could gain popularity.⁶

Another aspect of the BRI is the introduction of the Digital Silk Road (DSR) by which China exports its technology, including artificial intelligence, and mobile payment apps (like AliPay and WeChat Pay). As these payment systems aren’t actually “privately owned,” the distribution of these technologies signals China’s greater control over global digital infrastructure. If the digital yuan does gain traction, its incorporation into the DSR could allow China to change key financial networks amongst BRI participating countries.

Though the digital yuan has yet to truly pose a challenge to the dollar’s dominance, it has made huge impressions inside the US congress. Last November, Senator Rick Scott from Florida proposed the “Chinese CBDC Prohibition Act” which would prohibit US companies and businesses from participating in transactions that involve the digital yuan. In 2022, Scott was also among the nine supporters of the “Say No To the Silk Road Act” (which ultimately failed to pass).⁷ If passed, the legislation would have required extensive reporting and warnings about the digital yuan and its involvement in the Silk Road Act. These bills and initiatives reflect a broader effort within the US Congress to navigate the changing landscape of digital currencies and their effects on global geopolitics. As China continues to push forward with its digital currency agenda across financial institutions, US policymakers are feeling increasingly compelled to respond with measures aimed at safeguarding US interests and preserving the primacy of the dollar in the global financial system.

Though there still are vast shortcomings with China’s eRMB, the US is miles behind China in terms of producing a central bank backed digital currency. Due to America’s deep capital markets and political trust, the US dollar remains the dominant global reserve currency. However, frequent use of sanctions or debt brinkmanship could boost the power of the digital yuan in global markets. As the world turns more and more digital, a financial system dominated by CBDC like the digital yuan could become an unavoidable reality.

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A COMPARATIVE ANALYSIS OF BENJAMIN FRIEDMAN AND TIM JACKSON

BY WINSTON JIAN

* * *

Economists Benjamin Friedman and Tim Jackson stand at opposite poles regarding the relationship between economic growth and sustainability. Friedman contends that growth and sustainability are not at odds, arguing that rising living standards induced by economic growth incentivize individuals to support environmental protection. According to Friedman, this “influence of rising living standards” in conjunction with technological innovation and public policy will lead to sustainable development.¹ In contrast, Jackson asserts that “there is as yet no credible, socially just, ecologically sustainable scenario of continually growing incomes for a world of nine billion people.”² He suggests constructing a new macroeconomic model centered around a stationary or slow-growth economy.

This paper first contrasts the core arguments proposed by these two economists and then evaluates the arguments posed by each before making the case that these two seemingly divergent views may in fact be compatible given observed demographic trends towards population decline.

While it is tempting to think that economic growth necessarily harms the environment as higher income levels result in increased pollution, Friedman argues that the income-pollution relationship closer resembles a U-shape (as suggested by the Environmental Kuznets Curve first proposed by Grossman and Krueger in 1991).³ In the early stages of economic growth, “when an agricultural economy first develops a significant manufacturing capacity,” pollution emissions increase and environmental quality declines.⁴ However, beyond some level of per capita income, the trend reverses. At sufficiently high income levels, economic growth leads to environmental improvement. This trend reversal is born out of a shift from a manufacturing-based to a service-based economy which generates far less pollution. Friedman argues that this shift from manufacturing is not simply a result of offshoring; the production pattern changes are also reflective of an increasing in the consumption share of services and an increasing willingness to pay for more expensive technologies that reduce certain pollutants (e.g., air particulates from indoor cooking fires, pollutants in rivers, leaded gasoline, and high-sulfur coal).⁵

Unfortunately, carbon emissions don’t follow the same pattern. Because the effects of climate change are gradual and global—rather than imminent and confined to specific regions—it’s difficult for any household or

country to unilaterally commit to addressing the issue, even as living standards rise. As such, CO2 emission reduction requires international cooperation.

Tim Jackson’s argument tells a distinct story of growth. According to him, the current economic trajectory is by nature unsustainable. Instead of prosperity through growth, we need to seek prosperity in its absence. Jackson reasons that growth models create undue inequality, exhibit diminishing marginal returns to wellbeing, and create terminal ecological crisis.⁶ In particular, he frames Friedman’s argument of economic growth with reduced material inputs as the “myth of decoupling.” Decoupling—the separation of economic growth from the consumption of natural resources and emissions of greenhouse gases—has two forms: absolute and relative.⁷ Absolute decoupling occurs when there is an outright reduction in CO2 emissions or natural resource consumption as an economy grows; relative decoupling occurs when the ratio of emissions and resource consumption to GDP decreases.

Jackson contends that while relative decoupling has been achieved, absent absolute decoupling (which has yet to be observed) we will remain on track for ecological collapse. As such, Jackson advocates for a new macroeconomic model focused on prosperity without growth, drawing on Mill’s concept of a stationary economy and Keynes’s support for shifting focus from economic growth to wellbeing.⁸

To construct this new model, Jackson suggests a shift of economic activity away from resource-intensive goods toward “dematerialized” ecological assets and services such as education and the arts. Jackson also suggests a change in the definition of a “productive” investment under the new macroeconomic framework. Ecological investments may provide lower financial returns (as traditionally measured), but can provide greater social value due to increases in wellbeing and enhancement of ecological functions.⁹

I believe the economy Jackson envisions is feasible. Canadian economist Peter Victor has modeled a potential low-growth scenario, demonstrating the potential for reduced greenhouse gas emissions while maintaining relatively low unemployment rates. The challenge in setting up such an economy lies in determining the extent of government restrictions needed before it becomes reminiscent of a command economy, wherein the government dictates production capacities,

working hours, and investment directions.

And if we focus solely on the environmental advantages of this model, the issue of international cooperation arises. Many major environmental benefits of a shift from growth—particularly reductions in greenhouse gas emissions—are realized only when all developed countries adopt this slow-growth model. Yet that level of cooperation has empirically proved difficult. And to the degree that cooperation is achievable, it may be easier to attain over emission reductions alone rather than a paradigm shift in economics.

Upon closer examination, though, the two viewpoints presented by Friedman and Jackson may not be so inherently incompatible. Neither author comprehensively accounts for the demographic shift we are now witnessing. Population growth is slowing down, and in some countries there is already a net decline. Japan’s last two decades provide a real-world case study: output growth has remained relatively stagnant—not due to stagnant labor productivity but instead because of a declining labor force. Even though Japanese GDP growth averages out at only about 1% annually, growth in output per worker has excelled.¹⁰ Contrary to Jackson’s suggestion, there has been evidence of absolute decoupling in Japan, with CO2 emissions reducing from 1.27 billion tons in 2013 to 1.01 billion tons in 2020—a 20% net decrease despite GDP growth.¹¹

In this context, rising living standards could coincide with an ecologically sound slow-growth economy. Instead of looking to GDP, it might be more insightful, in cases of population decline, to measure the economic growth by focusing on labor productivity. In that case, slow GDP growth represents the “prosperity without growth” claimed by Tim Jackson while the increasing labor productivity will indicate rising incomes per capita, yielding the Environmental Kuznets Curve trend reversal result claimed by Friedman. Given that this demographic transition is a global phenomenon with large economies like China also seeing a population decline, there might be an opportunity to transform this demographic crisis into a window for sustainable development, drawing insights from Friedman and Jackson alike.

1. Benjamin M Friedman, “Chapter 15: Growth and the Environment,” in *The Moral Consequences of Economic Growth* (Alfred A. Knopf, 2005), p. 381.

2. Tim Jackson, *Prosperity without Growth? The Transition to a Sustainable Economy* (Sustainable Development Commission, 2009), p. 8.

3. Gene M Grossman and Alan B Krueger, “Environmental Impacts of a North American Free Trade Agreement,” *National Bureau of Economic Research*, November 1991, <https://doi.org/10.3386/w3914>, p. 42-46.

4. Friedman, p. 380.

5. Friedman, p. 381.

6. Jackson, p. 6-10.

7. Jackson, p. 8.

8. Jackson, p. 77.

9. Jackson, p. 77-80.

10. “Japan GDP 1960-2024,” *MacroTrends*, accessed February 29, 2024, <https://www.macrotrends.net/countries/JPN/japan/gdp-gross-domestic-product>.

11. “Japan Carbon (CO2) Emissions 1990-2024,” *MacroTrends*, accessed February 29, 2024, <https://www.macrotrends.net/countries/JPN/japan/carbon-co2-emissions>.

THE INTENDED AND UNINTENDED: THE CONSEQUENCES OF TRUMP’S TRADE WAR

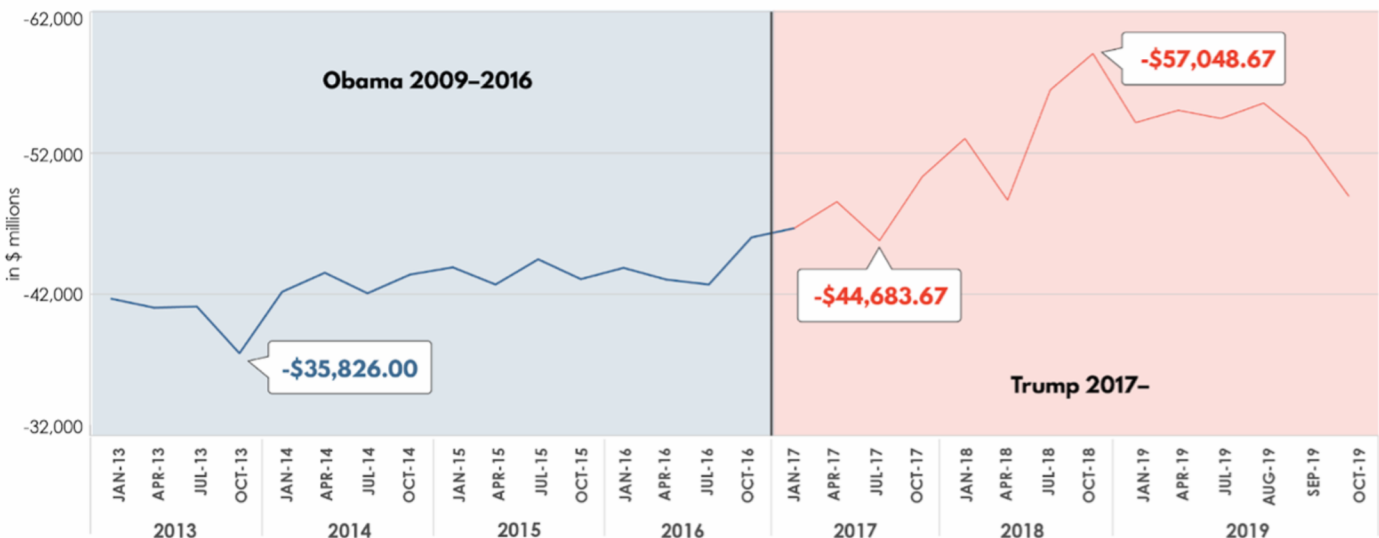
BY VARUN KANANGAT

As the 2024 election looms on the horizon, America seems poised for a rematch of 2020’s presidential election: Joe Biden vs. Donald Trump. As both candidates’ policies come under intense scrutiny in preparation for campaigns, Trump—the likely Republican nominee—has made headlines for his rhetoric regarding trade. With his increasingly escalatory rhetoric, it seems as though history is repeating itself. During his first term, Trump hiked up tariffs on Chinese imports, starting the infamous trade war. Trump argued that the tariffs would eliminate the decades-long U.S. trade deficit and promote domestic manufacturing. Trump also asserted that China engaged in unfair trade practices, including allegations of intellectual theft and exclusion of American companies from the Chinese market.

However, many economists warned against tariff hikes, asserting they would raise costs without effectively lowering the trade deficit. Of course, Trump’s policy during the trade war did not sit well with the Chinese government, leading to accusations of Trump’s promotion of American nationalism and eventually Chinese retaliation. When the chips fell and the trade war de-escalated, Trump’s policy appeared a massive failure: by 2021, the trade deficit had skyrocketed to its highest level since 2008.¹ In fact, throughout the duration of Trump’s term, the deficit increased from 481 billion to 679 billion dollars according to Commerce Department reports.² However, it is worth examining why this trade war failed. And with the possibility of Trump’s reelection for a second term amid his rhetoric regarding protectionist trade policy with foreign nations, including China, it is also worth investigating what higher tariffs did to the American economy and the possible economic implications of a second Trump term.

While Trump’s focus throughout the trade war was to lower the U.S.–China trade deficit, it instead did the opposite while simultaneously inducing major economic side effects. After Trump’s first trade war resulted in \$250 billion in tariffs on Chinese goods, Americans were stuck paying the price tag—nearly \$195 billion since 2018 and more than 245,000 lost jobs.^{3,4} Why? Because of rising prices caused by the tariffs, American shed employees to compensate—far from the Trump administration’s desired response. Rather than rejuvenate the U.S. job market and manufacturing, the trade war left American producers bearing the brunt of the impact. In 2017 and 2018, Trump announced multiple rounds of tariffs on Chinese products being imported to the United States.⁵ According to the Tax Foundation, these tolls led to a \$12.5 billion increase in taxes.⁶ This was not the only negative side effect that the tariffs produced; the Tax Foundation estimated that—with the inclusion of retaliatory tariffs—U.S. GDP decreased by 0.04 percent, or \$9.4 billion, and that 29,000 full-time jobs would be lost. In the long run, it also estimated that GDP will fall by 0.21 percent, wages by 0.14 percent, and 166,000 full-time jobs will be lost. Rather than providing a boon to

Monthly US trade deficit has skyrocketed under Trump, peaking at \$57 billion in October 2018



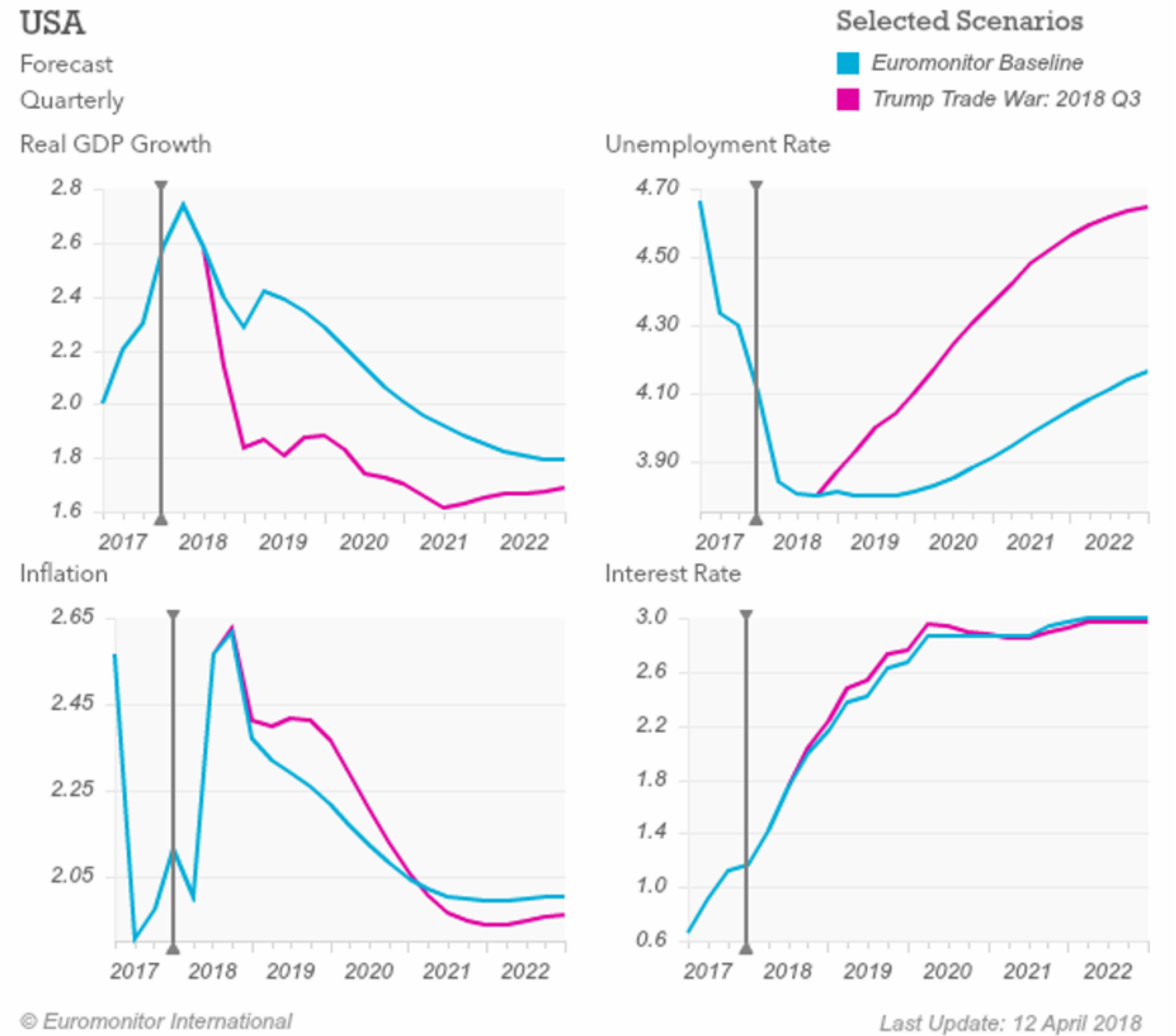
Source: "Trade Balance: Goods and Services, Balance of Payments Basis, Millions of Dollars, Quarterly, Seasonally Adjusted," Fred Reserve Economic Data, <https://fred.stlouisfed.org>, Accessed January 20, 2020

American producers, side effects are stymying economic growth and innovation. The Midwest dealt bore the brunt of the consequences. Despite Trump’s promises that the trade war would benefit the region the most, agriculture suffered from retaliatory tariffs and resultant unemployment. Moreover, the agricultural subsidies meant to offset effects had negligible impact.⁷

Trump’s first iteration of the trade war ended nearly four years ago. Yet during his 2024 presidential campaigning, Donald Trump has contemplated the idea of re-escalating once again. According to Washington Post reports, the Trump campaign has considered imposing tariffs upwards of 60% on Chinese goods alongside a general 10% tariff on all U.S. imports, all as part of the “Trump Reciprocal Trade Act” which he would attempt to enact if elected to a second term.^{8,9} At a rally in February, Trump summarized the retaliatory tariffs as “you screw us, and we screw you.”¹⁰ While some domestic industries could end up benefiting from these protectionist policies, Cornell professor Eswar Prasad believes raising prices amid already high inflation could suffocate businesses and consumers alike.¹¹

The primary benefit for domestic industries would be raised job growth rates. However, these gains would likely be outweighed by negative effects like inflation. Prasad asserts that the U.S. could end up becoming a pariah in the global trading system.¹² Trump’s trade agenda would end up making the U.S. more self-dependent, engaging in one-on-one negotiations with foreign nations to set trade policy and relying on domestic industries to produce a larger share of goods. With regards to China, Trump has asserted that he would revoke its favored trading status among U.S. companies, upending the current supply chain and damaging the country’s relationship with China.¹³ According to Oxford Economics, Trump’s proposed increase in tariffs would lead to the loss of \$1.6 trillion and 744,000 jobs by 2030.¹⁴ This economic nationalism—which Trump has strengthened as a core tenant of the GOP’s platform—will end up adversely affecting America’s economy.¹⁵

1. Palmer, Doug. “America’s Trade Gap Soared under Trump, Final Figures Show - ...” Politico, February 5, 2021. <https://www.politico.com/news/2021/02/05/2020-trade-figures-trump-failure-deficit-466116>.
2. Palmer, “America’s Trade Gap”
3. “Tracking the Economic Impact of Tariffs.” Tax Foundation, September 19, 2023. <https://taxfoundation.org/research/all/federal/tariffs-trump-trade-war/>.
4. Anderson, Stuart. “Tariffs Are Costing Jobs: A Look at How Many.” Forbes, September 25, 2018. <https://www.forbes.com/sites/stuartanderson/2018/09/24/tariffs-are-costing-jobs-a-look-at-how-many/?sh=7ef22e0b7b26>.
5. “Tracking the Economic”
6. “Tracking the Economic”
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9. Zahn, Max. “Donald Trump Wants to Escalate a US Trade War. Did It Work the First Time?” ABC News, February 25, 2024. <https://abcnews.go.com/US/donald-trump-escalate-us-trade-war-work-time/story?id=107448832>.
10. Zahn, “Donald Trump Wants”
11. Zahn, “Donald Trump Wants”
12. Zahn, “Donald Trump Wants”
13. Zahn, “Donald Trump Wants”
14. Stein, “Donald Trump Is Preparing”
15. Stein, “Donald Trump Is Preparing”



It is worth noting that a large portion of the tariffs that Trump instated during his first term are still in effect three years into the Biden administration.¹⁶ These tariffs would likely be hiked were Trump to come into office next year. Trump’s potential trade policy could mean the U.S. being ousted from the global trade system, hurting the very people Trump’s policies have appealed to. Experts agree on one thing: another trade war with China would fare no better than the first. Many domestic companies and international actors are already bracing themselves for tariffs.¹⁷ U.S. companies are already diversifying partnerships away from China and pivoting towards nations such as Mexico, signaling a potential shift in the U.S. trade economy.¹⁸ A number of CEOs and company executives believe that Trump’s policy will be irreversible and that the damage done to the U.S.-China relationship could be beyond repair.¹⁹

Out of all of the side effects of a potential trade war, growth of trade with Mexico may be the most positive.²⁰ Increased US investment in Mexico could boost its economic growth, providing substantial returns over time as a trade partner.²¹ In fact, in 2023, Mexico and the U.S. engaged in the

highest level of bilateral trade in their history, making Mexico the largest U.S. trading partner.²² While this number may be in part attributable to pandemic-driven shifts in supply chains, the overall trend still points at Mexico overcoming China as the largest American trading partner.

Looking back at Trump’s trade war, the U.S. economy suffered major consequences from both direct and retaliatory tariffs. From the significant job loss to diminished agricultural industry exports and to rising prices, Trump’s protectionist policies resulted in more or less the opposite of what he intended, raising rather than reducing the trade deficit. However, that is not the whole story. In some ways, Trump succeeded. He wanted to decrease trade dependence on China and with the rise of U.S.-Mexico trade it seems Trump has in part succeeded. While there are two sides to this trade war, voters will ultimately deliver their verdict in the 2024 election. Presumably Trump’s trade policy and rhetoric will weigh heavily on these voters’ minds.

16. Nichols, Hans. “Scoop: Biden Preparing to Keep Many of Trump’s China Tariffs.” Axios, January 5, 2024. <https://www.axios.com/2024/01/05/biden-keep-many-trump-china-tariffs>.
17. LaRocco, Lori Ann. “A Potential Trump Win Has Companies Already Planning for Chinese Tariffs and a New Trade War.” CNBC, March 13, 2024. <https://www.cnbc.com/2024/03/11/global-supply-chain-starts-planning-for-a-trump-win-new-china-tariffs.html>.
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SMITH AND RICARDO ON VALUE AND PRICE

BY PAVEL CASTILLO

Adam Smith and David Ricardo are two of the most influential economists whose ideas are still being debated and discussed in the modern era of economics. However, nowadays most economists have forgotten or have chosen to not pay attention to the theories of value and price that Smith and Ricardo proposed. This article argues that Smith and Ricardo have a theory of value and price that is to be taken seriously by modern economists as it can serve as an alternative for how we currently understand economics.

Smith in the *Wealth of Nations* “...regarded labor as the ‘source’ or ‘cause’ of value” and details that, “The exchange of commodities is in essence the exchange of social activities.”^{1,2} This means that to Smith a commodity is bestowed value because it is a product of social labor. However, Smith went further than defining “...the source of the commodity's power of attracting other commodities in exchange.” He wanted to explain “...how the extent to which it possesses this power is regulated or determined.”³

Smith, in trying to determine how the extent of a commodity’s value was regulated, argued that one must first figure out how to measure its value. It was this venture that sparked considerable controversy in Smith’s labor theory of value. According to Smith it was not sufficient to look at the “conditions of production of the commodity, but rather in the conditions of its exchange.”⁴ Smith then decided that the real measure of the value of a commodity was “...the quantity of labour which it would command” on the market.⁵ This is Smith’s famous commandable labor argument for the real measure of the value of a commodity.

There is a lot more to discuss about Smith’s labor theory of value such as Smith choice of the regulator of value, the reduction of skilled to unskilled labor, etc. However, the point of the previous discussion was to emphasize that labor is an essential part of Smith’s analysis of Capitalism and that Smith’s choice of commandable labor as the real measure of value has sparked contentious debates between various classical economists, eventually leading David Ricardo to develop his own version of a labor theory of value.

The theory of price in Smith begins with his observation that the market prices of commodities tend to gravitate “around a sort of average or central price.”⁶ This implies that even if the market prices of the commodities varied in the short run due to fluctuations in supply and demand, they tended to come back to this central price. This notion of a central price is what Smith called the “natural” price of a commodity.⁷ This leads to the importance of competition in Smith as competition is the mechanism that “makes market wages, rents, and profits generally gravitate around their respective ‘natural’ levels.”⁸

To expand on Smith’s theory of competition (which goes in hand with his theory of price), it is important to mention Smith’s “early and rude state of society.”⁹ This conception of an early and rude state can be thought of best as an analytical state made to abstract “production, exchange, and competition from profit and capital.”¹⁰ Smith describes a stage in human development in which there is no accumulation of stock or appropriation of land, though there is exchange between independent laborers that freely produce (and own the product of that labor). The question Smith then attempts to answer is what then determines the relative price of commodities?

Smith’s famous beaver-deer example imagines a world in which there are two sets of producers—beaver hunters and deer hunters—and that each of them makes their own tools (or gets their tools from a third party) to hunt their respective animals. The argument Smith details is that the total labor time in a commodity will depend on the labor time required to produce the beaver trap and the labor time required to catch a beaver, directly and indirectly for the beaver hunters. For example, for deer hunters there's labor required to produce bows and arrows and labor time required to use the bows and arrows to catch a deer. If you average the number of deer and the number of beavers, you then get an average labor time.

Smith's point is the following: if the deer hunter’s price is high enough so that the income of beaver trappers is higher in a certain week, then that means there is differing amounts of income from the same hours of living labor. So if the income is higher in the beaver sector than the deer sector then some laborers who make deer will quit and join beaver production. As a result, competition in the early and rude state produces a division of labor in which equal quantities of labor (direct and indirect) will earn equal incomes. The implication is that the relative prices of any set of goods will be proportional to their direct and indirect labor times.

Ricardo picks up many of Smith’s arguments, but begins his analysis with a critique of Smith’s “commandable labor” measure. He disagrees with Smith’s assumption that the quantity of commandable labor can be usefully regarded as an “invariable” measure of value. To Ricardo, this cannot be the case since labor itself is subject to fluctuations.¹¹ As a result, Ricardo developed a measure to replace Smith’s commandable labor. In order to do so, Ricardo took as a basis of his investigation that when a commodity is sold at its natural price it is being sold at its value.

This leads us to Ricardo’s theory of relative prices—specifically his 93% hypothesis. We first start off with the equation for profit: profit = revenues - costs. From here we can move some variables around and get the following equation for any price of any commodity of any sector:

$$p_i = \mu_i^T + \pi_i^T$$

1. Meek, Ronald L. *Studies in the Labor Theory of Value*. New York, NY: Monthly Review Press, 2014, pg. 62
2. Meek, Ronald L. *Studies in the Labor Theory of Value*, pg. 63
3. Meek, Ronald L. *Studies in the Labor Theory of Value*, pg. 63
4. Meek, Ronald L. *Studies in the Labor Theory of Value*, pg. 63
5. Meek, Ronald L. *Studies in the Labor Theory of Value*, pg. 69
6. Meek, Ronald L. *Studies in the Labor Theory of Value*, pg. 48
7. Smith, Adam. *The Wealth of Nations*. Charleston, SC: Pacific Publishing Studio, 2011. pg. 30
8. Shaikh, Anwar. *Capitalism: Competition, Conflict, Crises*. New York: Oxford University Press, 2018. pg. 330
9. Smith, Adam. *The Wealth of Nations* pg. 45
10. Shaikh, Anwar. *Lecture 2: Adam Smith and the Origins of Classical Economics*
11. Meek, Ronald L. *Studies in the Labor Theory of Value*, pg. 99

where p is the price of commodity i , μ is the vertically integrated unit labor costs in the i th sector, and π_i is the vertically integrated unit profits in the i th sector.¹² In other words this means that we can always break any price into direct and indirect wages (vertically integrated unit labor costs) plus direct and indirect profits (vertically integrated unit profits) for the i th commodity.¹³

We can further decompose this expression by noting that in Ricardo’s framework we are dealing with natural prices (or prices that yield equal profit rates), so the wage rates are all equal. If wage rates are held equal, the wage bill μ is the common wage rate times the total amount of direct and indirect labor. Furthermore we have the direct and indirect profits which can be written as one plus the direct and indirect profit-wage ratio, creating the new equation:

$$p_i = (wL_i^T) \left(1 + \left(\frac{\pi_i}{\mu_i}\right)^T\right)$$

Now we can derive an equation for the relative prices of the i th and j th sectors:

$$\frac{p_i}{p_j} = \left(\frac{L_i^T}{L_j^T}\right)(z_{ij})$$

such that:

$$z_{ij} = \frac{1 + \left(\frac{\pi_i}{\mu_i}\right)^T}{1 + \left(\frac{\pi_j}{\mu_j}\right)^T}$$

This equation tells us that prices are equal to relative direct and indirect labor multiplied by a disturbance term z .¹⁴ But Ricardo wasn’t done—he wanted to know how sensitive relative prices are to variations in the disturbance term.

Ricardo's conclusion is that the disturbance term has a limited impact on relative prices. He believes that the maximum influence would be around 7%. He further argues that if there's a proportionality between relative prices and relative labor times, even if the disturbance term is not negligible, then the changes in relative prices over time will be determined by structural elements (direct and indirect labor time).¹⁵ Domestically, there should be a strong correlation between relative prices and relative labor times across sectors and over time.¹⁶

From here we delve into one of Ricardo’s most influential contributions to classical economic theory: the theory of rent. The question he tackles regarding rent is whether natural prices are affected by the presence of rent. In particular, he wants to know whether quality of land causes further deviations in prices.¹⁷

Ricardo’s theory of rent does not however change the relation between market price and natural price, as it defines a different natural price which regulates the market price.¹⁸ If there are quality of land differences, each land will have a different potential natural price and it is an open question as to which dominates the market.

Consider a hypothetical scenario following Ricardo’s economic logic: imagine a country with limited land resources experiencing a surge in demand for wheat. Initially, the natural price of wheat is set at \$10 per bushel, reflecting the prevailing conditions of production on the available land. As demand for wheat escalates, production also increases to satisfy this growing demand.

However, if the existing land is of a certain quality, the natural price remains fixed at \$10 because production can be expanded without the need for higher-quality land.¹⁹

Ricardo's fundamental principle regarding reproducible commodities emphasizes that natural price doesn't inherently rise with demand, provided that the commodity is reproducible and production can be expanded using existing resources. This means that as demand continues to surge and existing land approaches its production limit, the market price of wheat may rise from \$10 to \$11, \$12, or even \$13, depending on the level of demand. Yet, at a certain point, it becomes evident that there is land available capable of producing wheat at a natural price of, say, \$12 per bushel. When production commences on this new land, it boosts the overall supply of wheat, leading to a downward adjustment in the market price and eventual stabilization.

This adjustment process involves shifting production from the best-quality land to the next best land available. As production expands to less fertile or accessible land, the market price of wheat rises accordingly. However, amidst these fluctuations, the natural price of wheat serves as the anchor that regulates market prices.

Now we can detail the concept of rent within Ricardo's framework. Initially, the land in use, represented by land A, may yield no rent because it can be sold for some marginal amount, allowing producers to earn a normal profit. However, when new land, say land B, is brought into production to meet increasing demand, the landowners of land B can charge a rent above the natural price.²⁰ This differential rent arises because land B produces wheat at a natural price of \$12, but the market price is regulated at \$12 due to the expanded supply.

Note here that differential rent denotes the disparity between the regulating price on the land used to meet the expansion of supply and all other superior land with lower costs and prices.²¹ So here Ricardo says that while market prices are regulated by production costs, it is the natural price of the land required to augment the supply that truly dictates market dynamics.

The main takeaway in discussing Smith and Ricardo’s theories on value and price is that they offer valuable insights into alternative perspectives on economics, particularly when contrasted with the dominant neoclassical economic theories commonly taught today.

Smith and Ricardo's perspectives diverge from neoclassical theories in their emphasis on competition and turbulent equalization as key determinants of prices. While neoclassical economics often relies on assumptions of perfect competition and equilibrium, Smith and Ricardo analyze capitalism through a lens that acknowledges the complexities of real-world market dynamics. They recognize that competition drives market prices toward a central price, but they also understand that this process is inherently turbulent and subject to various influences.

Despite the enduring relevance of Smith and Ricardo's theories, they are often misunderstood in contemporary economics. The neoclassical school of thought has often claimed to be the successor to much of their work, but in reality, Smith and Ricardo did not write about general equilibrium or marginal economics. They instead grounded their analyses in the realities of capitalism as it existed in their time, drawing from empirical observations to inform their theories.

The works of Smith and Ricardo are over a century old, yet their analytical frameworks and insights into capitalism remain highly relevant today. Modern economists can gain valuable alternative perspectives on economic phenomena and deepen their understanding of the complexities of market dynamics by taking their theories seriously.

12. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
13. In this context, indirect profit refers to the profit embedded in the raw materials acquired through purchase.
14. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
15. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
16. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
17. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
18. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
19. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
20. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2
21. Shaikh, Anwar. Lecture 4: Ricardo on Value and Distribution, Part 2

MEASURING THE ECONOMY

A Conversation with Dr. Francis Diebold

INTERVIEWER: MO FOROUTAN NASAB

Dr. Francis Diebold, chair of the University of Pennsylvania's Economics Department, shares his insights on the evolving field of economics, its role in addressing global challenges, and advice for aspiring economists.

Mo (Interviewer): Throughout your distinguished career, what have been some of the most pivotal moments that have shaped your research focus and philosophy in economics?

Dr. Diebold: A lot of it had to do with my training in the PhD. I had the wonderful good fortune to work with a Nobel Prize winner and a likely future Nobel Prize winner in econometric modeling. That's all about measurement and bringing data in touch with economics and sort of disciplining theory by measurement. That's really where I'm coming from in all of my research, one way or another.

Progress involves both theory and measurement, but I'm very much on the measurement side. A key part of that is what I and others would call predictive modeling, or just making predictions and evaluating models and theories in terms of the quality or success of their predictions. It's not enough to just have a model and estimate it or something. You've got to squeeze out a prediction and see how well they work. A lot of my research is geared toward developing tools that help us to make predictions and evaluate predictions.

Mo: Your recent focus on the econometrics of climate change is of great interest. Could you share how your research is contributing to our understanding of climate change impacts on economies, and why it's crucial for econometricians to engage with this topic?

Dr. Diebold: Climate change is arguably the key issue facing humanity over the next century, or at least one of the key issues. Econometricians over the last hundred years or more have been leaders in developing, using, and promoting a lot of tools that are absolutely crucial for climate measurement and modeling and prediction.

Some examples would be trends. We've developed many of the leading trend models and trend estimation methodologies. Another is models of seasonality. Climate weather tends to have a strong seasonal component, which may be evolving. Models of cyclical dynamics are again highly relevant in climate. Regime-twisting models are highly relevant in climate, like El Niño and La Niña. Definitely not least, tests and models of structural change - what could be more relevant in climate? That's what it's all about. The climate has changed structurally and is continuing to change as we move forward.

There's an emerging area called climate econometrics, where exactly these sorts of tools are applied productively on various climate issues. Econometricians also are very good at stochastic modeling, probabilistic modeling, which is important in assessing climate developments, including tails of distributions. Economists have made many of the most important contributions to fat-tailed distributions and detecting

changes in the thicknesses of those tails. That's completely relevant to extreme events and probabilistic modeling of extreme events.

Mo: The Aruoba-Diebold-Scotti Business Conditions Index is a tool used by the Federal Reserve Bank of Philadelphia to track real business activity. How did this collaboration come about, and how do you see the role of such indexes in shaping economic policy and understanding?

Dr. Diebold: ADS has been in production by the Federal Reserve Bank of Philadelphia for many years now, since the Great Recession of 2007-9. It's actually, as I understand it, their most popular product, which is really heartwarming.

The more interesting question in general is what the index is used for and if people find it useful. The answer is yes. It's used to track the economy. It's a leading example of what's called a nowcast. Everyone knows what a forecast is, but in some situations, you're not trying to predict the future as with a forecast, but just trying to predict in some sense what's happening now. The issue being that we don't know what's happening even now because economic data are only available with lags and they're sometimes long lags.

It's highly valuable to have a nowcast, an accurate assessment of what's happening now. Who uses that? Everyone from firms trying to make production decisions and labor hiring, firing type decisions. It's very useful to know if you are in an expansion or heading into a recession. That may have implications for whether you want to expand your plants or your workforce or how you want to allocate them geographically. Just knowing what's happening now is a key input to firms' decision making. It's also a key input to financial portfolio allocation.

Mo: Given the rapid technological advancements and the global shift towards sustainability, what do you see as the future directions for research in economics and econometrics?

Dr. Diebold: One of the key directions is machine learning, which is very much linked to predictive modeling. There's a lot new in machine learning. The enormity of the data that's being absorbed and processed, the dimensionality of the data, literally tens or hundreds or thousands of variables. So there's a lot new having to do with the scale, among other things, of modern data.

But there's a lot that's not new in terms of the emphasis on predictive modeling, quite desirably, just like econometrics. And the idea then of evaluating models or algorithms in terms of predictive success and differently, the idea of not assuming that whatever model you're using is in any sense true or the correct data generating process, taking seriously the insight that all models are just models, which means they're all false. They're approximations to a much more complicated reality.

Mo: For students who are passionate about economics and aspire to contribute to the field, what advice would you give them?

Dr. Diebold: I would remind you and others of the power of economic thinking, which at its core is just constrained optimization, or put in words, it's about doing as well as you can do, trying to do as well as you can do, subject to the constraints you face. That idea and

associated ideas like balancing costs and benefits, it's just an amazingly powerful way to think about a lot of things, because those sorts of problems come up constantly in business, in finance, in life generally.

It's just sort of strategic thinking, how to think strategically, and again, weigh costs and benefits and understand that others that you're interacting with may be doing or are doing the same thing. So good old strategic thinking, constrained optimization, trying to do as well as you can subject to the limitations placed upon you. That's a really good way to think about a lot of things.

Mo: In your view, what are the most pressing economic challenges facing the world today, and how can the field of economics address these challenges?

Dr. Diebold: The basic climate problem is a big, big problem. It's the problem of externalities, the idea being, of course, that I might put a lot of carbon in the air, but it really doesn't affect me that much. It's someone else's problem, or at any rate, only partly my problem and largely someone else's problem. So I don't really have the incentive to stop.

The question is how do we incentivize people to stop emitting greenhouse gases and related radiative forcings? Economists are good at that, or at least in theory, they're good at that. They know conceptually, theoretically, what needs to be done to internalize the externality. That's what needs to be done. It needs to be internalized, typically, by taxing something like a carbon tax. But the politics of how to do that, even within one country, let alone when it involves cross-country issues, as climate completely does, is challenging.

The good news in climate is that real progress is being made on reducing emissions. The bad news is that so far, it's not nearly enough. But at least some progress is being made and more will be made. And a big part of that, or at least a non-negligible part of that, interestingly, is coming not from taxation schemes and so on, but from the private market stepping in, adapting or creating various technologies to mitigate or adapt to emissions and profit by doing so.

Mo: Economics as a discipline often faces criticism for being disconnected from real-world issues. How do you believe the field can evolve to better serve society?

Dr. Diebold: I would take definite exception to that. I can't think of a field that is more in touch with real-world issues. Again, people struggling in various ways to do the best they can, subject to the constraints they face, firms trying to maximize profit, which is to say to do the best they can for their shareholders, individual consumers trying to do the best they can in terms of the demand side, thinking about ways to fix problems like internalizing externalities when markets don't work perfectly, as is the case when externalities are present.

None of those things could be more real world, more practical. So I think when people criticize economics for being out of touch with reality, the fact is that those people don't understand any economics. Nothing could be more in touch with reality. That's not to say that new challenges aren't arising constantly and that in the political economic sort of environments that we often get into, that there aren't fights, bitter fights that break out between partisan groups or other sorts of groups, but that's just the nature of life. But economics is very much cutting to the core of what is relevant in precisely the sorts of economic situations that we see ourselves in, in the real world. I think that's why the field is so vibrant. That's why so many students want to major in economics. So I don't really think we have a relevance problem.



A SNEAK PEEK AT NEXT EDITION...

While The Almanac will normally be published once each semester, we're excited to announce that you can look for **a second print edition coming out this winter**. We've already begun writing some of the pieces you will end up seeing and wanted to share a quick look at what we're working on.

While PEA will not be publishing again before the election, we still think it's important to review the policies discussed on the campaign trail. Many of the proposals promised by candidates do not end up written into law, yet they remain prevalent in policy discussions long after voting concludes. And depending on who wins the election, we're likely to see starkly different economic and tax policies put in place. In our winter edition, you will read about the economic implications of policies discussed by both presidential candidates, including but not limited to tariffs, no tax on tips, and taxation of unrealized gains.

We will also discuss current events in economics and the states of the domestic and international economies. Articles will discuss the interplay of monetary policy, foreign exchange and currency markets, inflation, climate change, AI, and labor markets.

Finally, we will include a variety of other pieces covering economic theory, philosophy, and a range of other topics still in the works. If there is anything that you as a reader would be particularly interested in reading an article about, please email us at **econalmanac@gmail.com**.

If you are interested in **submitting your own work** for potential publication, please fill out the QR code on the next page (more information there).

INTRODUCING AN OPEN SUBMISSION

Next edition, we will be introducing an open submission for **anyone and everyone** interested to submit their economics related writing to the Penn Economics Almanac. Submissions could include op-eds, articles, interviews, letters to the editor, or other works in the range of ~1000-2000 words. Topics can range, so long as there is a significant tie-in to economics.

Not every piece submitted will be selected for publication, but we want to give a forum for those interested to share their voice. If your piece is selected for potential publication, we will reach out to you at the email you provide in order to move forward with the editing process. If you are interested, please fill out the submission survey available through the QR code below to submit your pieces:



“The curious task of economics is to demonstrate to men how little they really know about what they imagine they can design.”

– Friedrich Hayek



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