

FEDERAL RESERVE BANK *of* NEW YORK



# Journal *of* Future Economists

**Economics of  
Globalization**





FEDERAL RESERVE BANK *of* NEW YORK



**2023**

# Journal *of* Future Economists

**Economics of  
Globalization**

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Student authors tackle the Economics of Globalization, a phenomenon that is everywhere and affects everything around us.

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**W**e are proud to present the third volume of the Journal of Future Economists. This year's Journal features 12 podcast scripts on the theme "Economics of Globalization." Student authors addressed issues such as semiconductors, shopping malls and retail space, and invasive species in the globalized economy.

*As you read this year's Journal and explore the creativity of our student authors, we encourage everyone to reflect on how the phenomenon of globalization affects all of us. This year, the theme clearly captivated students, as we received seventy-eight submissions from across the Federal Reserve's Second District. The submissions, once again in the form of podcast scripts, demonstrate students' rigorous research skills and unlimited originality. Their understanding of the impact of globalization on our economy is revealed through original research, community interviews, and the power of intellectual collaboration. We aim to amplify their voices in this Journal and ensure their diverse and forward-looking perspectives are heard.*

*We hope you enjoy reading and learning from these selections as much as the reviewers and editorial staff have. Thank you to all participating schools, faculty advisors, students, and communities for supporting the exploration of this year's theme. We hope that the High School Fed Challenge program continues to encourage young minds to pursue a career in economics and public policy, and we thank you, the reader, for engaging with these students' ideas.*

# Dear Future Economists,

---



**John C. Williams**

*President and Chief Executive Officer of the  
Federal Reserve Bank of New York*

*Congratulations on your outstanding contributions to the Journal of Future Economists! The hard work and team effort that you displayed show the talent and commitment you have to take on critical challenges facing the world today and in the future.*

*Globalization has had an immense effect on our economy. The rise and spread of COVID-19 along with other recent world events launched many of these issues to the forefront. Everyone—from infancy throughout all stages of adulthood—is impacted by our increasingly connected world. The ways that we interact with one another are dramatically different than we've experienced in the past.*



*That reality is here to stay. As our future policy makers, your ideas and perspectives on this topic are so valuable. I hope that throughout the production of these podcast scripts you've been inspired by the study and application of economics, and by the importance of this work. You did what we economists do every day: ask questions, analyze data, and come together to find solutions.*

*If you enjoyed this process, perhaps consider a career as an economist. It is challenging yet rewarding work. The Federal Reserve is one of many institutions that offers countless professional opportunities for you to support a safe and sound financial system. Even if you choose a different path, I know that you have a successful future ahead of you. I am excited to see what you do next.*

**JOHN C. WILLIAMS**



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*congratulations!*

# Participating Schools & Teams



## **Academy for Information Technology**

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Left to right: Emily Zhang, Matt Suescun, Elaine Nam, Veronica Baladi, Victor Amaritei, and Luke Bjerke

# Bergen County Academies

Hackensack, NJ

# Holy Guacamole! The Avocado as a Globalized Good in the United States and Mexico



**VERONICA:** Welcome to the Agriculture Anomalies Podcast, a podcast that explores unique aspects of the agriculture market. I'm Veronica Baladi, your host, and I'm joined today by economist Matt Suescun.

**MATT:** Thank you, Veronica. In today's episode, Holy Guacamole!, we will investigate the role of avocados as a globalized good and reveal newfound important implications for the future of this globalized market. To get there, we will examine the trade relationship between the United States and Mexico, the largest importer and exporter of avocados, respectively. We'll be discussing how avocados exemplify important economic concepts such as globalization, trade interdependence, comparative advantage, pricing, and employment.

**VERONICA:** Avocados are staples of American diets, especially with Super Bowl season right around the corner.

**MATT:** By the way, Veronica, which team are you rooting for this Super Bowl?

**VERONICA:** I'm only here for the "super bowl" of guacamole.

**MATT:** You know, this year's bowl almost didn't make it to the table.

**VERONICA:** No guac? That sounds like a nightmare.

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## CITATION STYLE

MLA 9th Edition

***With nearly 2.7 billion pounds of avocados consumed by Americans in 2020, avocados are integral to not only the American lifestyle, but also to U.S. wholesalers, distributors, and employment.***

**MATT:** Right? Just last February, the U.S.-Mexico avocado trade relationship was almost destroyed after a verbal threat was made to U.S. safety inspectors. A temporary ban on Mexican avocados followed on February 11, 2022 (Medina), threatening the global avocado market.

**VERONICA:** Could Mexico alone have that substantial of an impact on the global avocado market? More specifically, how did that ban affect us as U.S. consumers?

**MATT:** To put things in perspective, Mexico is the world's single largest producer and exporter of avocados. One Mexican state, Michoacán, accounts for 80% of all Mexican avocado exports made to the U.S. (UC Davis), and 30% of global avocado production (USDA). Naturally, 2022's temporary ban jeopardized a lot more than Super Bowl appetizers.

**VERONICA:** Huh, so the U.S. and Mexico are more interdependent than I thought.

**MATT:** Yeah, turns out you're not the only fan of avocados. U.S. avocado consumption more than doubled between 2010 and 2020 (Rabobank Research).

**VERONICA:** And you're talking about the same avocado toast I had for breakfast, right?

**MATT:** Those are Hass avocados. Like you, many U.S. consumers prefer this Mexican variety for its creamy texture. Hass avocados account for 90% of global avocado consumption, and their increase in demand is attributable to promotional programs which altered the avocado's image to that of a superfood, aligning with health-conscious consumer trends like your avocado toast (Giannini). With nearly 2.7 billion pounds of avocados consumed by Americans in 2020, avocados are integral to not only the American lifestyle, but also to U.S. wholesalers, distributors, and employment. Considering these massive potential consequences, the ban had to be immediately resolved. One week after the ban was placed, the USDA resolved its safety concerns with Mexican producers, lifting the ban and relieving the temporary shortage. Still, the conflict cultivated insecurity concerning the reliance on Mexican avocado exports in the U.S.

**VERONICA:** Seems like the consequences, if the temporary ban



persisted, would have been grave.

**MATT:** Very. A prolonged ban could have caused a spike in the prices of Hass avocados for U.S. consumers if they were unable to access cheaper imports from Mexico, and Mexican producers would have been left with a surplus of uneaten avocados. The surplus would force Mexican producers to lower prices in order to stimulate local demand. According to Jose Mendoza, an avocado farmer in the area, thousands of hardworking families in the region who depend on the industry would no longer be able to make a living (NYT). Then, the U.S. would need to seek other suppliers to fill this supply gap, which, as I'll explain, would have been incredibly difficult due to Mexico's distinct comparative advantage.

**VERONICA:** I never noticed this global spotlight on avocados. Have avocados always been imported to the U.S. or is this a recent phenomenon?

**MATT:** Mexican Hass avocados were finally allowed to enter the continental U.S. in 1997, although imports were still unable to enter California, to allow domestic production to thrive. Trade barriers were previously in place due to concerns about invasive pests and disease, but luckily the U.S. lifted these restrictions, leading to the avocado imports that we know and love today (EconPapers).

**VERONICA:** So, while the U.S. is a large consumer of avocados, Mexico is a crucial supplier for the U.S. market.

**MATT:** Exactly! Mexico is the undisputed leader in supplying this market, as it produced 2.44 million tons of avocados in 2021 (FAO United Nations).

**VERONICA:** I remember you said that a majority of avocados imported from Mexico come from one specific region called Michoacán. Why is there such specialization in this market?

**MATT:** That's where comparative advantage comes into play. The region's unique topography allows for year-round production with a consistent, uninterrupted four-season cycle. With 42,000 orchards that are exposed to different climates, the region is able to benefit from overlapping bloom seasons (Avocado Institute). Michoacán is also the only location where avocados can bloom 365 days a year thanks to heavy





precipitation, which serves as optimal, natural irrigation (Tckctck). In addition to this timely rainfall, the avocados are exposed to abundant sunlight and fertile soil (Avocado Institute).

**VERONICA:** Can't farmers in the U.S. replicate these conditions and mass produce avocados with advanced irrigation and fertilizer systems?

**MATT:** They could, but there are so many natural advantages present in Michoacán from the soil to the rainfall that would be expensive, inefficient, or nearly impossible to artificially recreate in the U.S. Even so, as a leading global economy, the U.S. may have the resources to overtake Mexico's specialization in avocado production. However, this would be unfavorable for U.S. consumers and global efficiency due to the greater associated opportunity costs of the U.S. investing in avocado production.

**VERONICA:** I didn't realize Mexico's factor endowments were so significant that it has both an absolute and comparative advantage, making it a much more efficient producer. Since the U.S. can import greater quantities of avocados from Mexico at lower prices given globalization and free trade, the U.S. has ceded to Mexico as the lead producer and diverted resources to other sectors.

**MATT:** Yes, exactly. In fact, as a result of U.S. support for Mexican avocados, Mexico's avocado exports have experienced notable growth, increasing from 100 metric tons in 1980 to 1 million in 2020 (Sayre).

**VERONICA:** While it's clear that U.S. avocado production comes second to Mexican imports, has domestic production played a role in the amount of U.S. imports?

**MATT:** Given Mexico's advantages in avocado production, U.S. production has stayed relatively stable at around 500 million pounds for the last 30 years, while imports have grown from near zero in 1980, to 2 billion pounds in 2015 (USDA). The U.S. is also the world's largest importer of avocados, accounting for 26% of world imports (UC Davis). Additionally, 16% of global avocado consumption can be attributed to the U.S., indicating its status as one of the top avocado consumers in the world (Fresh Plaza).

**VERONICA:** Ultimately, this data reveals the trade interdependence between the two countries. But what are the economic implications

of these more recent trade relations? Because, honestly, Matt – most of the buzz I've heard focuses on NAFTA and outdated relationships, but I'm sure you can conduct some clear economic analysis that's more relevant to today.

**MATT:** Of course. One distinct economic impact of the U.S. and Mexico's trade relationship is that avocado imports have financially benefited the U.S. economy. For example, in 2022, Mexican Hass avocado imports generated \$1.3 billion in tax revenue (The Packer). In the span of just eight years, from 2012 to 2020, tax revenues soared by 558% (PR Newswire). Most significantly, these imports have added \$4 billion to the U.S. value added GDP (Produce Blue Book).

**VERONICA:** To reiterate, the U.S. has definitely benefited from this trade relationship, especially as U.S. consumers, who have tripled their demand for avocados from 2001 to 2021, can now more freely access avocados (USDA). I wonder, however, if Mexico has also experienced similar benefits.

**MATT:** They have! In fact, in 2021, Mexican avocado exports contributed \$3 billion to their economy (The Econ Review), with \$2.8 billion of these revenues resulting from U.S. imports. Even at a microeconomic level, increased foreign imports directly improve the profitability of Mexican avocado producers. One analysis of production in Michoacán found that businesses that allocate 100% of production to the domestic market incur higher costs per unit and receive an average of \$51,655 per hectare in returns. On the other hand, businesses that allocate 80-90% of production on exports have returns of \$217,571 per hectare (García-Sánchez).

**VERONICA:** So, economies of scale that lower costs and raise global sales prices showcase that Mexican producers that export have increased profitability, largely attributed to the lower unit cost of fertilizers and pesticides.

**MATT:** Right. And since Mexico produces the largest share of avocado exports of any country globally, increased efficiency in their production is reflected in not just the domestic price of avocados, but the world price as well.



**VERONICA:** Ultimately, Mexico and the rest of the world benefit big time. But what about the criticism that a global industry hurts domestic employment? How has employment in both countries been affected?

**MATT:** In fact, employment is actually a major benefit of this trade relationship. The economic activity that the avocado industry stimulates has resulted in the creation of full-time and part-time jobs. In 2020, a Texas A&M University analysis found that the Mexican avocado industry had produced approximately 78,000 direct and permanent jobs (Avocado Institute). The industry produces an additional 310,000 indirect and seasonal jobs, thereby providing viable occupations to the region's population.



**VERONICA:** Sure, but is the American labor market also benefiting?

**MATT:** Absolutely. Importing avocados actually leads to net growth in U.S. jobs because of the jobs created within the supply chain to get avocados into your kitchen. The aforementioned

study found 58,000 jobs in the U.S. are directly attributable to trade with the Mexican avocado industry. To endanger that trade relationship would also endanger the jobs which depend on it, as well as leave unfulfilled demand. That's consumers like you, who want their bowl of guacamole on Super Bowl Sunday.

**VERONICA:** But those numbers are hard to understand on their own. What do they mean in context of the magnitude of U.S. imports?

**MATT:** Texas A&M found that for every million dollars of Hass avocados that Mexico imported, 14.5 U.S. jobs were produced. So, the job market is thriving. But labor income also tells a compelling story.

**VERONICA:** Labor income? Tell me more.

**MATT:** Well, labor income measures the amount that employed people earn by working. In the 2021-22 fiscal year, every dollar of U.S. imports of Mexican Hass avocados generated \$0.98 in income for the associated workers – almost a full return on investment (Avocado Institute).

**VERONICA:** Wow. So threats to this trade relationship are quite far-reaching— there’s much more at stake than just my guacamole. With much to gain, have other Mexican producers attempted to enter the industry?

**MATT:** Yes, actually. As of last year, the U.S. had approved for a second smaller region, Jalisco, to begin exporting avocados, and at the end of July in 2022, they successfully completed their first shipment! 200 tons of Jalisco-grown Hass avocados were shipped, marking the beginning of a hopefully lucrative export business for the region (U.S. News & World Report).

**VERONICA:** That could be a great sign! More competition might bring me a cheaper avocado. But won’t this elicit pushback from Michoacán producers, who have their own mini perfect competition models within their region, since Jalisco is taking away valuable clients? After all, we’ve seen how the avocado market creates jobs and healthy incomes for Michoacán producers, so won’t they be worried that a second region would eat into their earnings?

**MATT:** That is a valid point but will likely not be the case. Research shows that Michoacán’s supply is not adequately keeping up with U.S. demand, meaning that Jalisco’s involvement would help close this supply shortage (U.S. News & World Report). So, the entry of Jalisco into the Mexican avocado market should be seen as an asset, not a hindrance.

**VERONICA:** Then would the impact of this newer smaller region really be that significant?

**MATT:** Well, Jalisco is not exactly new to the game — they already export hundreds of thousands of tons across 25 countries (Mexico News Daily). It is notably smaller though; only 608 farmers and 10 packaging plants are approved to export to the U.S., as opposed to the 30,000 farmers and 65 plants in Michoacán. There is definitely room for growth.

**VERONICA:** What will this actually look like, numerically, in the next couple of years?

**MATT:** The estimated amount of area designated for avocados in Jalisco is expected to increase by 70.29% from 2021, as opposed to

Michocán's increase of 25.07% and Mexico's overall growth rate of 17.45%. That means that in a few years, based on my calculations, significantly more avocados will end up coming from Jalisco.<sup>1</sup>

**VERONICA:** That's a fascinating new find, Matt! With that, let's recap our avocado story.

**MATT:** What's happening with avocados right now serves as a broader example of how the perfectly competitive model and comparative advantage work hand in hand to serve an increasingly globalized world – and our future projections indicate that this trend will only grow stronger.

**VERONICA:** As trade barriers continue to lift and economies around the world increase in size, we will see avocados and other globalized goods increase in international trading volume. The easier and more profitable it is to trade avocados, the more markets like Jalisco will pop up to help fill that demand.

**MATT:** This increased volume will coincide with greater wages for workers in the industry. The increased globalization allows for an increase in market capacity until the supply truly meets the demand, a cap that we may not know until all barriers are fully removed. However, as we saw with the ban in 2022, trade barriers tend to arise as often as they are taken down.

**VERONICA:** The constant ebb and flow of trade restrictions are well-represented by the avocado market because its success – with each Super Bowl to come – is certainly dependent on international trade. Based on our analysis, Mexico seems to be the world's avocado quarterback.



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<sup>1</sup> This was calculated using data collected from the United States Department of Agriculture's (USDA) Foreign Agricultural Service's Avocado Annual. The data was taken from the last 10 years of the Avocado Annual. The information of the planted area in hectares was taken from the "Mexico Avocado Production by State." Linear regression modeling was used to estimate the growth rate with all R<sup>2</sup> values exceeding 0.85.





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**Left to right: William Wu, Nikhil Radosevich, Audrey Manley, Ronan Tiu, Jack Newell, and Aman Patel**

# Bethlehem Central High School

Delmar, NY

# *Money Doesn't Grow on Dead Trees:* Invasive Species in Our Globalized Economy

**MICHAEL CHU (HOST):** [Voiceover] One by one, they fly off their ships. Armor-clad with bizarre bodies and menacing antennae, these alien invaders from a distant land evade every defense measure that protects our nation. They insert themselves into our everyday lives, taking over entire regions while facing little resistance and showing no remorse for the damage they cause. By the time humanity realizes their presence, it's too late. They've already sabotaged our society.

Of course, I'm referring to Asian Longhorned Beetles.

A few months ago I was rudely awakened by a loud, grinding noise outside of my Cobble Hill apartment—a group of workers were cutting down my neighborhood's row of prized maple trees. Apparently, the trees had been infected by Asian Longhorned Beetles, and the U.S. Department of Agriculture had swooped in to remove them.

In pursuit of answers, I began investigating these mysterious insects and reached out to my friend, Dr. Claire Thacher from the USDA, to learn more. I took the M train over to Bushwick to see her efforts in preventing the spread of these beetles and to talk about their threat.

[horns honking, subway cars whooshing below, street chatter]

**CLAIRE THACHER (ECOLOGIST):** Hi, Michael, how's it going?

**MC:** Not bad, but something has been bugging me lately. I understand there are some insects infesting trees here in Brooklyn?

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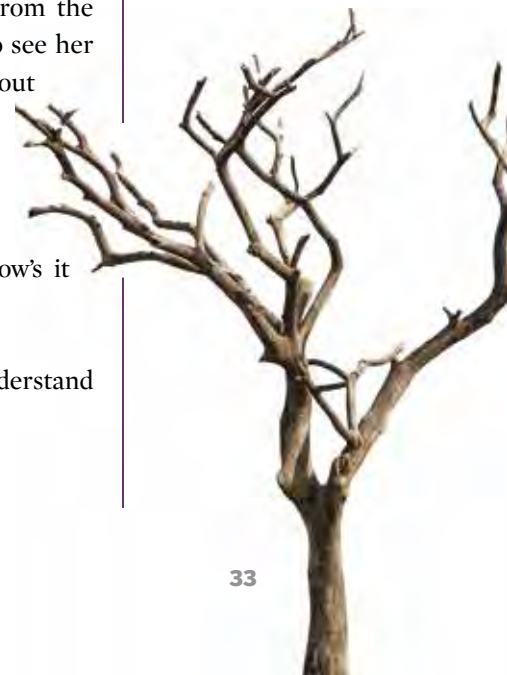
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MLA 9th Edition



**CT:** Yeah, let's head down to Bushwick and I can show you!

**MC:** On our way, do you mind telling us a little about the beetle that's responsible?

**CT:** The Asian Longhorned Beetle, or ALB for short, hitched a ride to the United States from East Asia and was first detected in New York Harbor in 1996 (“Asian Longhorned [nyis.info]”).

**MC:** What do you mean by “hitched a ride?”



**CT:** They're believed to have crossed over in wood-packing materials used primarily in container ships—things like wooden crates and pallets. Each ship can carry hundreds of thousands of pallets, and there are roughly 58,000 merchant vessels trading internationally each year (“Number of Ships”). This provides a great mode of transportation for wood-boring pests to infest vulnerable ecosystems.

**MC:** I'm seeing many holes in these trees. I assume the Asian Longhorned Beetle is the culprit?

**CT:** Yep, the holes are created when female beetles lay their eggs in the bark of a hardwood. As the larvae mature, they burrow into the heartwood of the tree, eating the plant's nutrients before wiggling out and leaving dime-sized holes in the bark. If you take a closer look, you can see

sap oozing out of the divots. Once an ALB infestation starts, there's only a short amount of time before the tree dies (“Asian Longhorned Beetle - About”).

**MC:** Wow. I read a Vox piece last week and learned that a lack of trees can elevate temperatures of surrounding neighborhoods by up to eight degrees Fahrenheit—raising energy bills, increasing the likelihood of heatstroke, and exacerbating poverty within the community (Fong). I'm sure this is only one of many reasons why the beetles are harmful. How far have they spread?



**CT:** We're sort of playing whack-a-mole with the outbreaks down here. Just as we eradicate one node of infestation, another springs up a few miles away. So far, the beetle has only widened its range onto Long Island ("Asian Longhorned Beetle - New York"). What we're working diligently to prevent, however, is the movement of ALB upstate through the transportation of infested wood.

**MC:** As a city guy myself, I feel like upstate is all trees. I imagine their destruction would have economic consequences.

**CT:** Absolutely. Currently, the major concern is the threat to the maple syrup industry. New York boasts the largest resource of tappable maple trees in the nation, with upwards of 2,000 maple sugarmakers ("Our Industry"). In 2020, we produced \$27.7 million in maple syrup—if these trees become infected, we would not only experience significant environmental impacts and economic costs, but worst of all, less maple syrup to consume (USDA)!

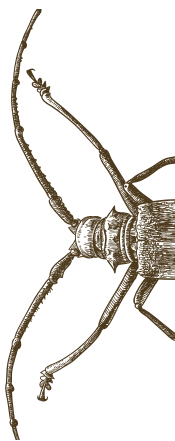
**MC:** Oh no, I love maple syrup! I make a yearly trip up to the Adirondacks to visit a syrup farm.

**CT:** I know, it's terrible! The Adirondack economy also relies heavily on tourists who visit to admire the seasonal foliage. Pre-COVID, tourism accounted for \$447 million in income for workers in that region, who then used that money to support many local businesses, generating an additional \$738 million ("Economic Impact")! If large swaths of the trees in the Adirondacks were dead, would you make the trip up north?

**MC:** I certainly wouldn't—the view from the mountaintop would be a lot less picturesque with a bunch of dead trees. How are you preventing this from becoming a reality?

**CT:** We're committed to containing the bugs in New York City. At the moment, we're using a quarantine system to eradicate hotspots of infestation. Once an infested tree is cut down, it cannot leave the area without being "bug-proofed": in other words, destroyed, chemically treated, or inspected prior to transport at the expense of local businesses (Rose). Ensuring tree service, firewood, and landscaping companies comply with restrictions on these materials is honestly the toughest part of the process because it forces them to either accept lower profits or pass the additional costs onto consumers.

***New York boasts the largest resource of tappable maple trees in the nation, with upwards of 2,000 maple sugarmakers ("Our Industry").***





**MC:** Given the complexity of the issue, it seems like a larger, more unified effort is required.

***The global financial toll of invasive species over the last 50 years is estimated at \$1.2 trillion, and the average annual cost has tripled each decade since 1970 (Diagne et al.).***

**CT:** Precisely, we can only do so much locally.

[city sounds fade out]

**MC:** I'm back in the studio with Claire and David VanDyke, an economics professor at the University of Michigan who's been working on a global agreement combating invasive species.

**CT:** Wow, I'm excited to hear how David's work could help us on the ground!

**DAVID VANDYKE (ECONOMIST):** Thanks for having me on!

**MC:** So, David, how did you become interested in this issue? I don't normally associate economists with climbing trees to look for weird insects.

**DV:** Trust me, a few years ago I didn't envision I'd be writing about bizarre bugs either—my specialty is international economics. Yet, it was my research in that field that exposed me to the tremendous effect economic globalization has had on the proliferation of non-native species.

Since 1950, the share of the world GDP tied to merchandise imports has tripled, a number buoyed in the last decades by the growth of developing countries and the creation of numerous free trade agreements. Consequently, the number of new invasive species recorded has also tripled during the same timeframe. Through trade, organisms are unintentionally transported from their native homes to environments thousands of miles away that would otherwise be unreachable. Consider the path of a single shipping container tracked by the BBC in 2014: in a year and a half, it traveled 47,076 miles by sea, 3,229 miles by rail, and 1,349 miles by road, visiting scores of nations (Hulme). The risk of invasive species spread is astronomical.

**MC:** And how does this growing trend affect us? What is its economic impact?

**DV:** The global financial toll of invasive species over the last 50 years

is estimated at \$1.2 trillion, and the average annual cost has tripled each decade since 1970 (Diagne et al.). The agricultural sector has been particularly affected: in the U.S. alone, crop losses due to non-native organisms amount to over \$40 billion per year. However, invasive species also result in costs related to the spread of disease, lost tourism revenue, and campaigns designed to eliminate the organisms (Paini et al.).

**MC:** That's certainly concerning. So what is being done to deal with this issue? Clearly, it must be on the minds of most policymakers.

**DV:** Well, Michael, unfortunately, it isn't. Part of the issue is that it takes an average of 10 years before a non-native organism is detected in an ecosystem, making it difficult to quantify the future financial effect of invasive species and to conduct accurate cost-benefit analysis (Reaser et al.). The lack of urgency on this problem is also caused by hyperbolic discounting: our cognitive biases tend to nudge us toward near-term gratification over the more valuable, long-term benefits that prevention measures would bring (Orrell 98).

**MC:** So that's why we need a new international agreement?

**DV:** Exactly. While there are existing international regulations that attempt to prevent invasive species spread, they are primarily focused on intentional transmission. It's vital that we improve standards regarding physical measures that prevent unintentional invasive species spread. These physical measures include three main types, classified by where they are executed: pre-border, before the goods arrive at their destination port; at-border, when they arrive at their destination port; and post-entry, after they have been transported beyond the destination port (Stas et al.).

**MC:** So I guess it's true—an ounce of prevention is worth a pound of a cure! Which measures are most effective?

**DV:** Pre-border measures are widely considered to be the most effective type, yet are least considered in international law (Stas et al.). Take biofouling, the process by which non-native organisms attach themselves to commercial ships and other aquatic vessels. It accounts for nearly 69% of all invasive species and has caused millions of dollars in damages to coastal ecosystems and local industries ("Non-Indigenous"). However, no international regulations have been passed to address it.



If common-sense pre-border mechanisms were made mandatory, such as the treatment of boat hulls with antifouling agents, the spread of invasive species could be significantly lowered (“Biofouling”). Other pre-border measures—including the chemical treatment of wood before shipment, pest-proof packaging, and rigorous inspections—offer similar benefits if practiced more frequently and efficiently.

**MC:** So you want to make these mandatory, but I’d think these measures could amount to a high cost for developing nations. How will you ensure they have the resources to implement them?

**DV:** You raise an excellent point, Michael, especially since developing countries attribute a lot of their economic growth to loose trade regulations. The revenue gained from the removal of all trade barriers would actually amount to double the aid they are currently receiving from industrial countries—a hefty sum (IMF Staff). Therefore, in the face of more pressing issues like poverty or public health, they lack incentive to allocate already scarce resources to adopt measures that could, in the short-term, decrease their revenue (Stas et al.). In order for these countries to implement the mandatory pre-border standards, we must create a funding program in the style of past UN-sponsored health initiatives. They can’t take on this financial burden alone.

**MC:** Now here’s the million dollar question: where would the money come from?

**DV:** Governments from around the world would contribute based on their portion of global trade volume, having discretion over how the funds are raised. For instance, American exports and imports make up about 13% of world trade, so the U.S. would put up 13% of the total (“World Trade”). One viable method of raising funds could be a Pigovian tariff on imports, which would internalize the negative externality that invasive species pose by directing the cost onto shipping companies responsible for the spread of the organisms. That said, the unintended consequences of such a policy could be damaging: due to higher costs, firms might reduce their trade with nations that enact the tariff.

**MC:** This all sounds great, David, but is it feasible? International agreements are difficult to craft. Why can’t the U.S. take its own steps to reduce the spread of invasive species in the country, at least in the meantime?



**DV:** Simply put, global issues require global solutions. Invasive species prevention resembles a chain whose strength is determined by its weakest link. Regardless of the strength of our national policies, the effectiveness of our efforts would be undermined by inferior protocols in other countries. Besides, even if the U.S. wanted to enact unilateral prevention policies at its ports, they'd be subject to intense legal scrutiny. The World Trade Organization's General Agreement on Tariffs and Trade, or GATT, stresses non-discrimination as the fundamental basis of international commerce: countries should treat imported products from one nation no differently than products from any other nation ("General Agreement"). Suppose the U.S. wanted to subject wood imports from South Korea to more rigorous at-border inspection due to the heightened risk of invasive beetles in shipments originating from the country. South Korea could claim such an act violates the non-discrimination principle and respond by filing a complaint with the WTO.

**MC:** I can see why international cooperation is crucial. Claire, in your opinion, how would David's overall plan work in practice? Would it be useful in dealing with species like the ALB?

**CT:** Definitely! I think improved trade regulations and a fund that allows developing nations to implement them is a great idea. In the 1990s, when the ALB first came over, most of East Asia was comprised of developing countries ("World Economic"). If this fund was available, they may have been more proactive in preventing the spread. I recently spoke to one of my colleagues in Kenya about the Yellow Crazy Ant, an invasive species they've been struggling to contain to their country for years. Like the Asian Longhorned Beetle, these ants can travel in wood packing materials used in trade. Unfortunately, Kenya's government does not properly enforce a mandate for companies to have their goods inspected before they are exported (Wafula et al.).

**DV:** I love that you brought that up, Claire. Due to infrastructural and financial difficulties, Kenya has struggled to implement the WTO's Sanitary and Phytosanitary Standards, which aim to stop commercial exports that threaten human or environmental health ("Agreement"). Consequently, Kenyan avocados have frequently been vectors for the unintentional spread of fruit flies overseas. Many nations, including South Africa and China, have responded by banning the importation of these products, causing \$16 million in annual losses for Kenyan farmers (Holland). If Kenya had access to this proposed world fund, they'd

be able to afford the costs associated with executing inspections and treating products. By reducing the spread of invasive species, they'd not only protect the global biosphere but expand and repair fruitful commercial relationships with nations that had previously been wary to trade due to Kenya's lax regulatory environment ("Certification").



**MC:** David, Claire, thanks for joining us today! Clearly, there are effective economic methods of addressing the invasive species issue that should be enacted as we move forward.

**MC:** [Voiceover] International trade has brought us year-round bananas, life-changing medical developments, and my precious air fryer. As we continue to globalize, more people, especially those in developing nations, will enhance their economic prosperity, leading to improvements in living conditions, health, and education.

Unfortunately, increasing global commerce will also exacerbate the grave issue of invasive species. The Asian Longhorned beetle may have already arrived in the United States, but unless we act now to craft a multilateral agreement that updates outdated trade standards and provides developing nations with the funds to adequately implement them, it won't be the last invasive species we encounter.



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**Left to right: Can Jiang, Yana Eber, Hiba Altaf, and Sara Yuen**

# Brooklyn Technical High School

Brooklyn, NY



# Pop Culture Economics: Japanese Anime Globalization and Impact

**HOST:** Hello there! This is Pop Culture Economics with your host, Yana.

## [MUSIC PLAYS]

**HOST:** *Pokémon, One Piece, Attack on Titan*, we have all heard of these shows. The anime industry is booming across the world and in the West. It is almost impossible now to find a large city without an anime store or a teenager who has never heard of the word “anime.” However, Japan never had this kind of power before in history. But how did it get to that point?

Joining us today are experts from the East and West who will give us more insight into the increasing soft power of Japan.

**SARANDOS:** Hello everyone, I’m Ted Sarandos, the CEO of Netflix. I look forward to this conversation.

**ISHIHARA:** Hello, I am Tsunekazu Ishihara, the President of the Pokémon company. It’s my pleasure to be here today.

**CALEB:** Hi! I’m Caleb. I’m an avid fan of anime and I’ve been watching anime since I was eight years old. Currently, I’m a student at Hunter College.

**KISHIMOTO:** It is nice to meet everyone. I’m Kishimoto, best known for writing the *Naruto* manga series, which was later translated into the widely popular anime.

**HOST:** Before we start, I want to give a definition of anime for listeners who may not be so familiar with this entertainment genre. Anime is defined as a style of animation originating in Japan that is

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*The interview portrayed in this paper is a product of the authors’ imagination. While the interview may reference actual people, the subject matter and language attributed to those people is entirely fictitious.*

characterized by stark colorful graphics depicting vibrant characters in action-filled plots often with fantastic or futuristic themes (*Merriam Webster*).

We would now like to start our conversation with our guests, Masashi Kishimoto, the renowned author of the popular anime, *Naruto* and its sequel *Naruto Shippuden*, and Tsunekazu Ishihara, who took the *Pokémon* and expanded it to video games, anime, movies, and more. Thank you for joining us. So, how did you go about writing your scripts and what do you think makes them so appealing to the western audience?

**KISHIMOTO:** I knew I wanted a combination of uniqueness and universality to be present in my own work from the start. I got the inspiration for *Naruto* from my own childhood so there are definitely distinctive personal aspects of it. For example, I was a poor student in school because I spent most of my time drawing anime and writing stories (Solomon). Similarly, Naruto [the character] does not perform well academically, and unlike me, he is a loudmouth who gets in trouble. But he's also driven by an unwavering determination to become the Hokage or leader of his village, so he can gain the respect of his village. *Naruto* has widespread appeal because it incorporates many themes and messages that are likely to come up in any young person's life. He grapples with how he fits into his community, people's expectations of him, and how he views himself, and along the way, he makes mistakes and overcomes numerous obstacles (Solomon). On his path to Hokage, Naruto's perseverance inspires the audience and gives them the motivation to pursue their dreams no matter how challenging a task that might be (Solomon).



**ISHIHARA:** The same goes for the *Pokémon* anime. The characters are meant to represent the emotions and ambitions of real preteen children, including their mistakes and hardships, so that the characters are more relatable. We also attempt to make anime appeal to a global audience by not having Japanese culture be the primary concept of the anime and including characters from ambiguous backgrounds so it allows anyone to be able to relate to the content (Carter).

**HOST:** How would you say the anime industry has changed during your long career and what has made it so successful, particularly in the west?

**ISHIHARA:** I have seen extraordinary growth and evolution in the anime industry during my career. Early anime films were intended primarily for the Japanese market and, as such, employed many cultural references unique to Japan. Of course, as you know, anime now has a much broader worldwide audience (*Britannica*). I believe its uniqueness is what has given it global appeal; anime often explores ideas that stand apart from most Hollywood fare because anime paints a portrait of characters and themes that are different yet universal (*Asia-Pacific*).

**SARANDOS:** Yes, I agree with Mr. Ishihara. The success of anime in the western world is largely due to the unique perspectives anime provides. Young Americans are intrigued by the cyberpunk landscape and controversial plot of anime, which offer[s] a portal into a different aesthetic and psychological universe. (Jozuka).

**HOST:** I see. That is some great insight, Ishihara and Sarandos. Now, Kishimoto, while there are many relatable themes in *Naruto* regarding the coming-of-age experience, I think that alone does not distinguish *Naruto* from other western media. Can you talk a bit about how you highlight aspects of Japanese culture through this anime? And what do you think makes it appealing to the western audience specifically?

**KISHIMOTO:** Well, first off, the mechanics of the *Naruto* universe, known as ninjutsu, are based on Buddhism and Shintoism principles from modern-day Japan (“An Introduction to Japanese Mythology”). Both of these religions believe in inner spirituality and the ability to attain an inner balance between light and dark, which are all characteristics of ninjutsu in *Naruto*. Furthermore, *Naruto* ninjas use chakra, which is a force that allows them to make attacks by yielding fire, water, lightning, rock, and wind. This idea of chakra comes from the Hindu concept of spring vortices which act as energy focal points throughout the body (“An Introduction to Japanese Mythology”). The word chakra itself means “wheel” and it is thought to be controlled by seven points in the body (“An Introduction to Japanese Mythology”). These points also influenced the idea of the eight gates technique, which was used by two *Naruto* characters, Rock Lee and Might Guy, in order to maximize their taijutsu or physical combat abilities (“An



**Anime often explores ideas that stand apart from most Hollywood fare because anime paints a portrait of characters and themes that are different yet universal.**

Introduction to Japanese Mythology”). Therefore, many Japanese religious values are embedded within the show, which allows the western audience to gain insight into these values through the show while also enjoying culturally and historically rich content mixed with some action and flare. This also ended up being one of the main reasons why *Naruto* is still popular today: it is different enough from regular Western media with its ninja battles but still has common elements of an action show (“An Introduction to Japanese Mythology”).

**ISHIHARA:** To build off that, we at Netflix thought that since our global population is hungry for new diverse experiences, bringing anime to the United States would make an immense profit. Many anime companies, including ours, decided to take advantage of the distinctness of anime by expanding to the western world. So far it seems to be a success, as “[a]nime’s rabid fan base in Japan and other areas around the world spends more than \$5 billion on film and DVDs and an additional \$18 billion on anime-linked merchandise” (*Asia-Pacific*). According to research, the “animation industry in Japan generated a revenue of approximately 1.31 trillion Japanese yen” in 2021. A major contributing factor is the “growing demand in other countries, which has led to a strong increase in overseas sales” (“Japan: Sales Revenue”).

**ISHIHARA:** In fact, merchandising and streaming business accounted for the two largest shares among domestic sales revenues (“Japan: Sales Revenue”). We often collaborate with toy and figurine companies while the animators develop their character designs so the merchandise can be released less than a week after the release of the characters themselves. It means that “television networks, advertising agencies, and toy manufacturers are all in on the development from the beginning, putting up money to finance the project and taking a share of the profits after the film is released” (*Asia-Pacific*).

**HOST:** As I am seeing, the anime industry makes merchandise and other content in addition to the anime to make extra money.

**CALEB:** As an anime watcher, I also made that same observation. I know most people watch anime for free through various websites, but they still buy plushies, keychains, and other merchandise for much higher prices compared to regular products.

**HOST:** Now, on that note, I want to shift this conversation to real life. Caleb, would you like to talk to us about your personal experiences of



Japanese influences on the United States?

**CALEB:** Yes, of course. Personally, I've seen that anime is very popular among young people such as those in my college. The anime club is very popular there and there's a strong and active community centered around it. Also, around the city, I've seen a lot of anime and manga stores which many students, including myself and my friends, frequent. Additionally, Anime NYC is a big event that I attend every year in New York City (Anime NYC). It takes place at the Javits convention center, which being such a large space allows them to showcase many types of anime and different aspects of the genre (Anime NYC). I always love seeing the exclusive screenings and interviews by the various Japanese creators, getting to purchase exclusive merchandise, and dressing up as anime characters, also known as cosplay. Anyway, like I said I attend every year and through the years there seems to be a growth in attendance. I've been seeing more and more of my friends and classmates at Anime NYC and other conventions, of which there also recently have been a lot more of.

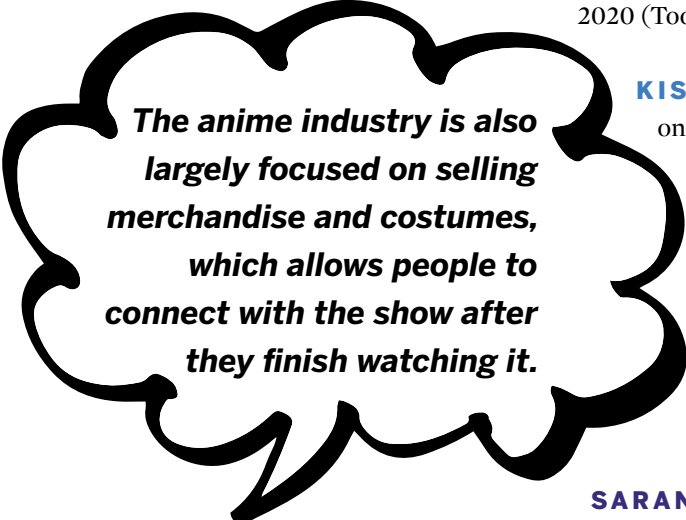
**HOST:** What do you think the appeal of anime is, and do you think the popularity of anime will continue to grow?

**CALEB:** I do think that anime will continue to become more popular. As Mr. Ishahira said earlier, anime often explores themes outside of Hollywood or western media and I think that appeals to a lot of people as they often have characters that people can relate to. And going back to previously, there's a strong community around anime which draws a lot of people in as well. I'd say that our community is a very welcoming one and people are always looking for a sense of community because anime is more likely to branch out to unique topics and it's easy for someone to find others in the community they can connect to.

**HOST:** Thank you for that insight, Caleb. Now I also want to direct some questions to Sarandos. So, why did you choose to collaborate with the anime companies and place these shows on Netflix?



**SARANDOS:** We are constantly growing our anime collection on Netflix. During our “AnimeJapan 2022 event, a slate of 40 anime titles [was] set to debut on the service through the end of the year” (Forbes). This industry, especially today, is largely profitable since unlike films, animation did not require in-person interaction, so “animation was one of the few media industries that were relatively unaffected by COVID-19 shutdowns” (Forbes). The data has also shown that the viewership of anime shows on Netflix doubled in the U.S. in 2020 (Toonkel and Juro).



***The anime industry is also largely focused on selling merchandise and costumes, which allows people to connect with the show after they finish watching it.***

**KISHIMOTO:** *Naruto* is actually one of these anime. We have given Netflix a license to stream part of our content.

**HOST:** Amazing. Now, besides purchasing the rights to various shows, how have you taken advantage of the booming industries?

**SARANDOS:** We have made original anime that is only available on Netflix, based on a popular manga. Anime is a more convenient medium for Americans to consume because of the already booming film industry in the United States. As Ishahira mentioned before, however, anime has a larger grip on a younger audience due to them being able to do something besides just watching the show. The anime industry is also largely focused on selling merchandise and costumes, which allows people to connect with the show after they finish watching it. We see the great potential that the anime industry has.

**ISHIHARA:** We are very grateful to collaborate with Netflix and other American streaming companies to spread our content. It also gives access to new audiences, expanding our reach to people who may not have heard of anime before. However, our main audience still comes from people who watch the content for free. We are also taking advantage of the rising popularity of VR to develop “anime games with virtual surround sound”, which would greatly impact the demand for the market (“Anime Market Size”). Anime is an unstoppable force that we as entertainment industries in the United States decided to collaborate with instead of competing against.

**HOST:** This is a great example of Japan's economic soft power. Due to the growth of anime's appeal, it is influencing American companies as well since it is a valuable investment. It may seem like all the money is going to companies like Netflix, but Japan has something else up its sleeve. Let me give an example. There are multiple films from studio Ghibli on Netflix, but everything else attached to the film is from Japan. Japanese companies offer Ghibli merchandise, a museum, and even a Ghibli theme park (Onemu).

**KISHIMOTO:** And in response to the widespread success of the *Naruto* and *Naruto Shippuden* anime and manga, we have been able to sell millions of merchandise, and costumes replicating ninja outfits, and launch a sequel series, *Boruto*. The prequel has become one of the most viewed anime on TV Tokyo while building off its prequel's fandom base. In fact, a recent statistic found that *Boruto* had almost thirteen times more audience demand than an average Japanese TV series ("Boruto: Naruto Next Generations"). Like *Naruto*, it has evolved to adapt to changing western values by including more female representation within the main characters while continuing to showcase Japanese cultural values and issues such as the demanding familial expectations for women (Coolwood). We hope that in the future, *Naruto* and other anime can continue to draw a global audience, prove profitable for the Japanese economy, pay tribute to the highs and lows of Japanese culture, and most of all serve as a fulfilling source of entertainment for the youth.

**HOST:** I love to hear how much thought you gave into crafting *Naruto*, Kishimoto, and all that it brings to the table. And the same goes for *Pokémon*, Ishihara, and the rest of the anime on Netflix, Sarandos. Thank you to everyone for your time. It has been a pleasure interacting with all of you and giving the audience an insight into the anime industry from so many perspectives.

**ISHIHARA:** It has also been an honor to be part of your podcast.

**SARANDOS:** Thank you for hosting this wonderful conversation!

**CALEB:** I enjoyed our discussion here!

**KISHIMOTO:** I hope you all enjoyed this episode.





**HOST:** Thank you for listening to today's podcast. Our next Pop Culture Economics episode will discuss the way that employees in the anime industry are impacted, so stay tuned for more on the growth of this new entertainment genre. This is your host, Yana, signing off!

**[MUSIC PLAYS]**



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**Left to right: Kavya Aggarwal, Prisha Maggu, Nicole Southern (advisor),  
Neha Bommireddy, and Sarvagna Malladi**

# Edison Academy Magnet School

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# Biodiversity Loss: The Hidden Cost of Economic Globalization

**KAVYA:** Welcome back to “The Dollar Dialogue,” where we invite guests from around the world to discuss the intersection of economics and global issues. Today we’ll be discussing the hidden cost of economic globalization: biodiversity loss. I’m Kavya, your host, and here with us today are three guest speakers from the world of economics to give their “two cents” about what economic globalization is and how it’s impacted biodiversity.

**SARVAGNA:** Hello! I’m an undergraduate studying macroeconomics and I’m super passionate about land conservation. I spend my weekends participating in local activism initiatives and trying to pass petitions to preserve ecosystems like watersheds and forests.

**NEHA:** Hey everyone! I’m so excited to be here today. I’m an economics analyst and I like to spend my free time as a wildlife photographer.

**DR. PRISHA:** Greetings! It is an honor to be here. I am a professor specializing in research on greenhouse gas emissions. I find great joy in playing with my pet hamster: Aldo Leopold—named after the father of wildlife ecology himself.

**KAVYA:** Thank you all for making the time to be here today!

## Economic Globalization and Specialization

**KAVYA:** As modes of transportation and communication have improved, people around the world have become increasingly interconnected. In the global context, nations have become more interdependent and can efficiently trade resources and contribute to the world market. This practice of economic globalization integrates

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economies through trading goods, services, ideas, and technology to promote economic growth.

**SARVAGNA:** Surges in economic globalization usually occur after a large-scale global event. For example, I believe the most recent one started after World War II when global trade, in terms of GDP, increased from 25% to 60% between 1960 and 2019 (“Economic Globalization”).

**NEHA:** Economic globalization leads to increased competition in the global market, incentivizing countries to identify and focus on their strengths in order to compete. This is a strategy known as economic specialization—focusing on producing and exporting specific goods and services in a country that has a comparative advantage (the ability to produce a certain good at a lower opportunity cost than other countries) instead of trying to produce everything domestically (“Globalization: A Brief Overview”). Brazil has a comparative advantage in the production of coffee due to its humid climate and fertile land, while Saudi Arabia has a comparative advantage in oil production due to its reserves of crude oil (Trade and Development Report 2019).

***In the global context, nations have become more interdependent and can efficiently trade resources and contribute to the world market.***

**SARVAGNA:** Economic globalization can accelerate the development of multiple economies at the same time. For example, Dr. Prisha, take your hamster, Waldo.

**DR. PRISHA:** Aldo.

**SARVAGNA:** Right. Aldo. Let’s say you have a colony of Aldos. Some of them might be better at digging tunnels, while others are excellent at finding and gathering food. Another hamster might have a special talent for keeping the shelter clean. By specializing in different tasks, the hamsters can maximize their productivity, and as a result, the entire group benefits.

**KAVYA:** I see! So, by focusing on their strengths and areas of comparative advantage, Aldos—I mean, countries—can increase their productivity, efficiency, and competitiveness in global markets and generate higher income from exports.

**SARVAGNA:** Exactly!



**NEHA:** But how does one quantify economic specialization, you might ask? One measure of the level of a country's specialization is its economic complexity score. Economic complexity is a way to measure the diversity and uniqueness of the goods a nation produces—the lower a country's score, the less varied its exports, and the more specialized it is (Amable). According to Harvard's Atlas of Economic Complexity, the most economically complex countries are Japan, Switzerland, and Germany, with complexity scores above 2. Lesser complex countries are Venezuela, Nigeria, and Liberia, which have complexity scores as low as -2.24 ("The Atlas of Economic Complexity"). As you can see, lower-income countries are more likely to become specialized (Bahar).



**SARVAGNA:** Despite the many advantages of economic specialization, there are a few hidden costs that accompany this strategy. And we have gathered here to discuss one of them: a loss of biodiversity.

**DR. PRISHA:** Precisely. Economic specialization has led to the fragmentation of the environment and a discernible decline in biodiversity.

### **Economic Specialization's Impact on Biodiversity**

**KAVYA:** Just got a question from @greencrusader203 which brings us to the main focus of today's episode: How has economic globalization impacted biodiversity?

**DR. PRISHA:** Of course, there are many factors at play, but I'd say that the loss of biodiversity can be attributed to three main effects of specialization: deforestation, change in land use, and overexploitation of natural resources.

**SARVAGNA:** When countries focus on a certain physical product, they often have to decide between protecting ecosystems and improving trade. Developing countries especially have no choice but to destroy forests in order to keep up with demand. "During the 1980–2000 period, more than half of the new agricultural land across the tropics came at the expense of intact forests, and another 28% came

from disturbed forests” (*Global Land Use Change*). The main reason for deforestation is the expansion of land for agriculture.

**NEHA:** As a wildlife photographer, I’ve hiked through a fair share of forests. These rich ecosystems are home to more than 75% of all species of animals, insects, and plants (“Forests”). When trees are cut down, these species lose their shelter and sources of food and have increased risks of predation. These animals are forced to move to neighboring forests and their habitats become fragmented. The populations of animals become vulnerable as they face a lack of resources, have decreased prospects of breeding as the population becomes dispersed, and might conflict with humans during migration (Greentumble).

Nowadays, every time I go on a hike, I haven’t been seeing as many species of birds as I used to. The list of endangered species is only growing and the disappearing wildlife is becoming more and more noticeable.



**DR. PRISHA:** Reminds me of Aldo’s distant ancestor: the rare European hamster. The species is predicted to go extinct in thirty years. Truly devastating news. Not only are forests crucial to preserving biodiversity and reducing the effects of climate change, but they also offer many valuable resources for humans. Contributions from forests to the U.S. are calculated to be more than 250 billion dollars (“UN Report”).

**SARVAGNA:** Plus, forests are home to one of the biggest ecosystem services: carbon sequestration. Forests play a crucial role in mitigating greenhouse gas emissions by absorbing and storing carbon dioxide from the atmosphere. (“The Role of Forests in Carbon Sequestration and Storage”). In fact, “the Amazon contains an amount of carbon equivalent to a decade of global human emissions” (“The Economic Case for Nature”).

**NEHA:** Exactly. Forests play such an important part in mitigating the climate change crisis, which is why it is so important to limit deforestation.

**KAVYA:** Another great question from @thegreenguru415! “What did you mean by changes in land usage? And why would economic



specialization cause this?”

**KAVYA:** I can take this one. When countries become specialized, it makes more sense to divert more resources toward the goods or services they are exporting, and fewer resources toward those they are not in order to leverage economies of scale. This can be demonstrated in the noticeable trend of countries sacrificing local ecosystems to increase agricultural output (*Global Land Use Change*).

**SARVAGNA:** At one of the rallies I was at, I heard that the “appropriation of global primary productivity” has resulted in the “conversion of nearly 35% of terrestrial ecosystems to agricultural lands” (*Globalization and Land-Use Transitions*).

**NEHA:** And, as you can probably imagine, this isn’t exactly a natural change—it isn’t normal for a region to consist mostly of grasslands for cattle or fields for coffee plants. Terrestrial ecosystems are home to a diverse range of plant and animal species, and converting these ecosystems to agricultural land can lead to habitat loss and fragmentation, which results in the loss of biodiversity.

**KAVYA:** This ties into the overexploitation of resources too, right?

**DR. PRISHA:** Indeed it does. Over a long period of time, as a supplier of a certain product, a nation begins to use up its natural resources like lumber or livestock. However, these countries are still expected to produce the product to keep up with the global demand for it. Without having a careful system of replenishing and protecting these reserves, they risk running out. Nations beginning to feel the pressure of contributing to a world economy often turn to negligently overusing their national resources to continue having something to trade. Overexploitation poses a huge threat to biodiversity as plant and animal populations are harvested at a rate faster than they are capable of replacing it (“Overexploitation”).

**SARVAGNA:** Overusing soil and over-extracting fossil fuels contributes to the problem. According to the United National Environment Programme, “[r]esource extraction has more than tripled since 1970, including a fivefold increase in the use of non-metallic minerals and a 45% increase in fossil fuel use” (“We’re Gobbling Up”). Overharvesting crops and not maintaining the soil’s fertility after harvest has led to mass soil depletion, which is especially prominent

in places such as the midwestern U.S. We rely on these agricultural fields to provide food and raw materials for the entire country and to trade with other countries, but forgetting that these resources are exhaustible will only worsen the situation.

**DR. PRISHA:** Sarvagna, what astute observations! Aldo always told me to tell the unembellished truth, so that is what I will share with the audience. Although managed forests have increased and global marine fishery production has decreased, “an additional 791 million metric tons of carbon dioxide” are emitted annually (“The Economic Case for Nature”). It has been suggested that carbon dioxide emissions are adversely affected by both economic globalization and trade openness.

***The long-term health of the environment and therefore the global economy heavily depends on maintaining biodiversity rather than solely prioritizing specialization.***

**KAVYA:** So we’ve discussed three of the main ways that economic specialization is causing biodiversity loss, and why we should care about biodiversity. But does prioritizing biodiversity mean that we have to sacrifice economic development?

**DR. PRISHA:** Not necessarily. We’ve actually seen that focusing on protecting biodiversity can work hand-in-hand with economic development. In

fact, the recent loss of biodiversity has been shown to slow the growth of global GDP. Biodiversity loss is predicted to lead to a “loss of global real GDP in 2030 of \$90-225 billion...Under the business-as-usual scenario, the world is projected to lose about 46 million hectares of natural land and face a continuous decline in fish stocks” (Norgaard).

**NEHA:** Environmental degradation can lead the ecosystem to “collapse entirely,” impacting low and lower-middle-income countries the most. Sub-Saharan Africa and South Asia, relying on pollinated crops and forest products, would face huge economic setbacks. This trend increases the burden on farmers, food insecurity in poorer nations, and the threat of extinction of around 1 million plants and animals (“UN Report”).

**KAVYA:** The long-term health of the environment and therefore the global economy heavily depends on maintaining biodiversity rather than solely prioritizing specialization. Specialization forces nations to produce something that they have a comparative advantage for, but since this has been shown to often damage the overall well-being of

especially poorer countries, we must find another way to be inclusive in the global community and maintain trade with all willing nations.

## Mitigation Strategies

**KAVYA:** It's clear that there are a lot of complex factors at play here. Sarvagna, as someone who's involved in local activism, what do you see as the most effective ways to address these issues?

**SARVAGNA:** Well, Kavya, I think there are a few things we can do. One is to support policies and initiatives that promote sustainable land use and conservation, and another is designing specific areas for certain uses, like agriculture, forests, and protected areas (*Global Land Use Change*).

**NEHA:** Well put. To achieve a healthy balance between conservation and production, it is essential to use available land more efficiently. This can involve cultivating high-yield crops on fertile soil in existing agricultural areas and allocating less productive land for ecosystem services like preserving biodiversity, protecting watersheds, and carbon sequestration. (*Globalization and Land-Use Transitions*).

**SARVAGNA:** I read recently that shifting from traditional agricultural practices, like extensive grazing or slash-and-burn agriculture, to more modern methods has been shown to increase the food output per hectare ratio, thereby reducing the amount of land needed for agriculture. A study on the case of the Chaco dry forests calculated that the current meat production from 4.7 million hectares of forests around “traditional grazing lands” could be replaced by using just 16,000 to 150,000 hectares of soybean fields (*Globalization and Land-Use Transitions*). That means the land used could be divided by almost 300!

**KAVYA:** Interesting! So though setting up the infrastructure to modernize agricultural systems might be costly, it could be another viable long-term solution. I believe—

**DR. PRISHA:** Good heavens!

**NEHA:** What?



**DR. PRISHA:** Aldo was supposed to be served his suppertime meal 5 minutes ago! I must go, but this has been a delightful conversation.

## Conclusion

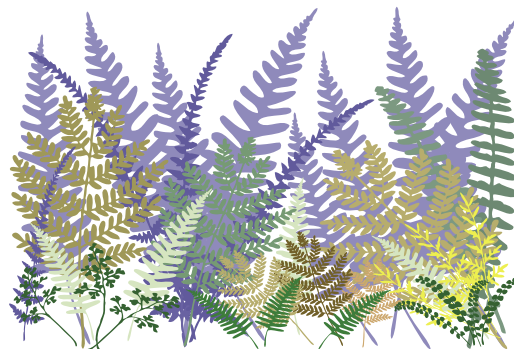
**KAVYA:** Oh dear. Well, I think this marks the end of today's episode. To wrap up, biodiversity is crucial to strengthening the economy. In fact, programs devoted to preserving biodiversity have a benefit-cost ratio of at least 100 to 1 ("Economic Benefits of Biodiversity").

**SARVAGNA:** That's right. Making an active effort to preserve biodiversity instead of sacrificing ecosystems will have a much greater benefit for the economy in the long run.

**NEHA:** Looking ahead, it's estimated that the demand for resources such as crops, water, and energy will increase dramatically by 2050. The GDP is expected to increase by 317% and the global population is anticipated to reach 9.7 billion people in just under three decades ("Here's How We"). To meet this demand sustainably, we'll need to modify how and where we produce food and energy.

**KAVYA:** By doing so, we can support the growth we'll see in the coming decades and create a thriving, resilient planet for generations to come.

**KAVYA:** Well, this concludes this week's episode of "The Dollar Dialogue." Thank you to all of the guest speakers that joined me today. Tune in next week to learn about the halted supply chain... and whether Aldo received his suppertime meal!





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**Front (left-right): Abigail Khaytman, Ella-Cohen Kashi, Bianca Gulotta**  
**Back (left-right): Eric Kim, Michael Pignatelli, Joseph Van Wie (advisor)**

# George W. Hewlett High School

Hewlett, NY

# Competing in the Global Semiconductor Industry: Let the Chips Fall Where They May

I am ABIGAIL, I am ERIC, I am MICHAEL, I am ELLA, and I am BIANCA, and we are the PROs & ECONs Podcast.

**HOST:** In today's episode, we will be discussing how globalization is represented by the current competitive chip and semiconductor industry. Abigail, why don't you set the scene for us.

**ABIGAIL:** A German businessman named Olaf sits in a coffee shop with his iPad, working on his weekly schedule. Before this iPad landed in his hands, the semiconductor that powers it was designed in the United States, manufactured in Taiwan, assembled in China, and shipped to Germany. The same can be said for the credit card chip used to purchase his drink. This chip has enjoyed the trip from Silicon Valley to the Rhine Valley and is a product of the efforts of the global market.

**HOST:** Wow! I did not realize that there were so many countries involved. Let's find out a bit more about where this all started. Michael, what are "chips" and how were they created?

**MICHAEL:** Computer chips, made up of semiconductors, are the basis for modern electronic devices. They are most simply composed of an electrical conductor and an insulator, with conductivity between, hence the idea that it is semi-conductive. The first of these was developed in



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1874 by Ferdinand Braun, but practical uses for semiconductors only sprang up in the late 1940s with the development of the transistor by John Bardeen, Walter Brattain, and William Shockley (Lukasiak & Jakubowski, 4). This invention has since allowed for electronics to be made smaller, creating the opportunity for the development of modern computers, mobile phones, and other electronic devices. The semiconductors most used in electronics today are generally designed by a “fabless firm,” often found in Silicon Valley, California (which is the reason for the region’s nickname) (Murry), with manufacturing



outsourced to a company known as a “foundry.” The Taiwan Semiconductor Manufacturing Co. (TSMC), Samsung of South Korea and Intel of the United States are three of the largest foundries in the world (The Economist). Recent years of a software-focused technology sector in Silicon Valley has resulted in greater outsourcing of manufacturing to China, and other nations. However, the recent, large-scale chip shortages

have prompted the development of manufacturing centers in the United States, although this will take at least several years to complete (Morra, Perry).

**HOST:** Thank you Michael. Perhaps we could get an update on how far this has come. Bianca, where would you say the epicenter of chip production and manufacturing is today?

**BIANCA:** To start off, an astonishing 65% of semiconductors are produced in Taiwan and this is primarily because of TSMC (Bowman). As Michael stated earlier, one of the largest foundries of chips in the world, TSMC, generates about 50% of the world’s semiconductors and unlike other companies they create chips that are then sold to other companies such as Apple and AMD (Dhyani) (World Population Review). These chips are created through a nanofabrication process which is the assembly of one, two, or even three-dimensional structures that are highly complex (Vasilev). This process takes place on substrates which are more commonly referred to as wafers and at the end of this process the wafer is separated into its chip and connected to the lead

frame where it is then enclosed with resin (SCREEN Semiconductor Solutions Co.). Additionally, the Taiwanese government created tax incentives that are provided to companies that participate in investing in the chip industry and export materials that are used in the process. If this was not impressive enough, Taiwanese companies are able to control such a vast amount of the industry since they have invested large sums of money into research and development (Milne). As of December 2022, TSMC stated they would almost triple their investment to \$40 billion to build a second factory in Arizona which will aid in increased production and development (Kuzub). With these large investments it is no wonder that Taiwanese companies are dominating the production of chips.

**HOST:** Is this just limited to Taiwan?

Following Taiwan, South Korea, Japan, the United States, and China are the countries that contribute the most in semiconductor production (SCREEN Semiconductor Solutions Co.). In 2021, the South Korean company, Samsung, generated \$83.09 billion (USD) in sales revenue on a global scale (Alsop). This is no small feat and while Taiwan may control the majority of the industry, other countries and companies have proven they are just as successful. Within the U.S., exports of semiconductors generate about \$62 billion as of 2021 (World Population Review). While the U.S. has lost control over this industry in the past few decades due to Taiwan and Japan taking over the market it currently produces about 12% of the worlds semiconductors and controls 43.6% in its market shares (World Population Review).

Within the near future it is expected that there will be a race between China and the U.S. in who can control more of this industry. While neither country is likely to reach Taiwan's success, it is clear that exerting a larger control over the industry can come with great rewards. India is also projected to increase its ranking as its industry has been rapidly growing since 2019 and similar to Taiwan, the incentives are also offered to help promote the industry (Dhyani).

**HOST:** So that is how the chips are developed...but what's next? Ella, could you tell us about how chips impact manufacturing of products and where this is happening?

**ELLA:** Semiconductors actually have an immense impact on manufacturing considering that the current chip shortage has affected about 170 different industries ranging from electronics to healthcare to cosmetics (WIMB). The largest market for chips is China since it



is the largest manufacturing hub in the world which is anticipated to produce up to 25% of chips by the year 2030, 20% more than it is currently producing. China assembles 35% of all electronics that use semiconductors, this is done through a chain of importing the semiconductors, to then assemble the tech products in China to be sold either domestically or they are re-exported to be sold as goods for final consumption. After the U.S., China is the second largest consumer of goods containing semiconductors (SIA).

***These tiny chips play such a big role in not only the global economy, but also the various technologically-based industries around the globe ranging from the automobile to the smart device industry.***

**HOST:** What other consequences could this have beyond the economic production, consumption, and competition?

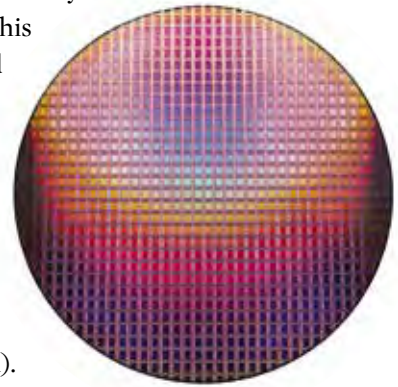
**ELLA:** Currently, the U.S. has been pushing for Japan and the Netherlands to restrict their exportation of high-tech semiconductor making equipment to China, in order to limit their ability to create a leading microchip (Ben-Achour et al.). This is mainly due to national security concerns that have been rising considering China's potential militaristic and intellectual power once given the most advanced semiconductors. These restrictions urged by the U.S. are meant to target future espionage using the AI made possible with high-tech semiconductors. The chip shortage that was prevalent over the past year has made many increasingly aware of how many everyday goods are impacted by a supply and chain issue that involves semiconductors. The U.S. Commerce Department is presently planning to subsidize domestic chip manufacturing in order to acquire the supply of advanced chips needed for America's weapon supply (WSJ).

**HOST:** Ella, from what you told us it sounds like many countries are "putting their chips on the table." Eric, when and why did this industry become so competitive?

**ERIC:** Let me start off with this, according to the Semiconductor Industry Association, the global sector generated \$580.1 billion in revenue in 2022 (SIA). If that doesn't tell you anything about the importance of semiconductor chip production, then I don't know what will. These tiny chips play such a big role in not only the global economy, but also the various technologically-based industries around the globe ranging from the automobile to the smart device industry. So naturally, every country wants to have the best technology in order to

persuade the most consumers to buy their products. In order to get a firm grasp of how this whole competition started, we need to go way back.

In the 1960s when semiconductor chips were rapidly increasing in efficiency, one of the only producers was in U.S. factories and their only customer was the U.S. government. Afterwards, these companies realized they could make a large profit by creating products for not only the government but also for everyday consumers. When making this transition, semiconductor manufacturing companies would relocate their factories to South Korea, Japan, and Taiwan because labor was cheaper which allowed them to make an even larger profit. In the 70s and 80s U.S. allied governments began investing in their own semiconductor manufacturing companies so that they could get in on the up-and-coming chip craze. Up to this point, China had been left behind because of the Cold War in which the U.S. had closed off chip exports with them. However, after its conclusion in the 90s the relationship between the U.S. and China became smoother so most of the limitations on exports had been removed. This allowed China to catch up to the other countries in terms of technological development. China was able to import as much as \$200 billion in semiconductor chips by 2016 (Ellis, et.al).



**HOST:** How have chips led to a global economic interdependence?

**ERIC:** Well, what's really interesting to see is how dependent all of these countries are on each other when it comes to producing chips. Three companies in the U.S. develop the software used in semiconductor chips, which the designs are then made with a machine that's only made by one company in the Netherlands like Ella said before. That machine in the Netherlands uses equipment exported by only the U.S. And finally, everything is put all together by companies in Taiwan and Korea (Ellis, et.al). It's ironic that all of these advanced countries want to compete against each other to see who can improve their military and technology in the shortest amount of time, but all depend on each other in order to achieve this success. Perhaps instead of trying to one-up each other, these countries can put their motivation for economic success aside and cooperate to advance this technology together which could potentially benefit not only them economically but us as the consumer as we'll be able to have access to more capable devices.

***The semiconductor industry has become the economic and geopolitical competition of the near future, and invested countries are “all in.”***



**HOST:** Abigail, what can we expect about the future and implications of this semiconductor industry?

**ABIGAIL:** Most sources look to 2030 when discussing the future of the semiconductor industry. For instance, The European Chips Survey found that the demand for microchips would double by 2030 (European Commission). Furthermore, sources predict that China will dominate microchip production by then; however, many governments are taking strides toward more protectionist policies (Patel). The European Union, for example, has introduced the Chip Act to increase Europe’s 10% market share by increasing domestic production by 20% by 2030 (European Commission).

Similarly, the United States Secretary of Commerce, Gina Raimondo, aims to make the United States the largest semiconductor producer in the world by 2030 (Barr). Through the United States’ CHIPS Act, the U.S. aims to invest \$280 million in domestic microchip production (Barr).

However, China is taking steps to counteract the CHIPS Act by readying a \$143 billion dollar support package to build the semiconductor industry in the confines of their homeland (Zhu). For China, this will be one of the largest fiscal incentive packages and will truly challenge the U.S. and Europe for years to come.

This is truly the new-age arms race. The semiconductor industry has become the economic and geopolitical competition of the near future, and invested countries are “all in.” Superpowers have turned this into an economic total war which transcends politics and culture. For that reason, governments want the chips to fall where they may.

**HOST:** Incredible. This will definitely be a topic we revisit and I am interested to see how it plays out in the next ten years. That is all the time we have for today. Thank you for listening to this episode of the PROs & ECONs Podcast. Tune in next week for our episode on the financial impact of the Silicon Valley Bank failure.



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Left to right: Ambika Grover, Ryan Kaufman, Cindy Li, Max Lu (on the computer screen), Amrutha Nandakumar, Charles Andrew Miranda, Nicole Orlofsky, and Elliott Gordon

# Greenwich High School

Greenwich, CT

# It's a (s)Mall World: Globalization, E-Commerce, and Shopping Malls

**CINDY:** Hello, listeners! Welcome to this week's episode of "Global-Eyes." On today's episode, "It's a (s)Mall World," we will explore an economic whodunnit: who killed the mall? I'm Cindy Li.

**ELLIOTT:** And I'm Elliott Gordon.

**CINDY:** The other day, I decided to take a trip down memory lane and visit the Stamford Town Center (STC), but it wasn't quite as I remembered. The Apple store was gone, as were Saks OFF 5TH, Ann Taylor, Gap, Uniqlo, Abercrombie & Fitch, and Banana Republic. Once a linchpin of Stamford's downtown, the mall felt desolate—a shell of its former self. I felt like a true crime detective instead of an economic correspondent.

**ELLIOTT:** What happened to this former retail giant—who or what was the culprit for the missing stores, and what is its place in the local and global economy?

**CINDY:** The American mall is an icon of post-war prosperity, consumerism, and suburbia. But it seems that the forces that brought us the mall in the first place are also a key source of its undoing: globalization. With the introduction of shopping centers in the 1960s, consumers could conveniently access a plethora of goods from across the globe in a single market.<sup>1</sup> However, in the past two decades,

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<sup>1</sup> Philip Drost, "How malls and freeways helped segregate America," CBC, last modified June 26, 2022, accessed March 15, 2023, <https://www.cbc.ca/radio/spark/segregation-by-free-way-1.6499455>.

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***The American mall is an icon of post-war prosperity, consumerism, and suburbia.***

e-commerce has facilitated the direct connection of consumers to producers around the globe, removing the need for intermediary shopping centers.

**ELLIOTT:** Today, we analyze the rise and fall of a local mall, and how globalization continues to transform shopping and the communities around us.

**CINDY:** At the height of the mall-mania, the STC attracted domestic and international tourists, both as consumers and prospective retailers. Many saw the success of the mall and hoped to bring similar enterprises back to their countries.<sup>2</sup>

**ELLIOTT:** As an internationally renowned attraction, the STC brought investment and tourism to the city of Stamford and the state of Connecticut. At one point, the state government even requested 300 of the mall's uniquely labeled shopping bags to be given as gifts to attendees of a conference.<sup>3</sup> As customers were drawn to the mall due to its robust varieties of goods and services, retailers were more inclined to set up shop in the mall, which in turn attracted even more customers. This positive feedback loop is known as the dual network effect.

**CINDY:** During its prime, the mall charged a high rent, which was a symbol of how profitable its stores could be.<sup>4</sup> However, the STC's high rent soon became its downfall. As e-commerce developed into a cost-effective alternative to brick-and-mortar stores, it was not economically feasible for businesses to continue operating them.

**ELLIOTT:** By 2019, the STC was in rapid decline. As stores began to clear out, its future became uncertain, prompting the mall's owner, the Taubman Company, to list it for sale.

**CINDY:** Unfortunately, the STC was unable to catch a break; by the following year, with the strike of COVID-19, many of the remaining stores were forced to close. I remember that some of the mall's biggest

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<sup>2</sup> Jack Cavanaugh, "Tourists Welcome at Stamford Mall," *The New York Times*, May 22, 1988, sec. CN, accessed March 14, 2023, <https://www.nytimes.com/1988/05/22/nyregion/tourists-welcome-at-stamford-mall.html>.

<sup>3</sup> Cavanaugh, "Tourists Welcome," sec. CN.

<sup>4</sup> Nancy Arum, "Despite Its Decor, Shop Prepares Beef," *The New York Times*, November 20, 1983, sec. 11CN, accessed March 5, 2023, <https://www.nytimes.com/1983/11/20/nyregion/despite-its-decor-shop-prepares-beef.html>.



attractors, such as Uniqlo and Zara, were forced to shut down, leaving the STC a skeleton of the bustling retail hub it once was.

**ELLIOTT:** Following the initial departure of anchor stores, the network effect began to crumble. As large retailers such as H&M turned to the digital marketplace, fewer people visited the STC.<sup>5</sup> In turn, Saks OFF 5TH, Apple, Godiva, and American Eagle all determined that they could minimize losses by closing their physical stores in the STC. The thought of such a large unused space in the center of downtown Stamford prompted discussions about alternative uses; many speculated it would be converted into dorms for UCONN's Stamford campus.<sup>6</sup>

**CINDY:** The STC's experience is not unique; approximately 25% of U.S. malls are projected to close by 2025.<sup>7</sup> In 2017, traditional retail stores were struggling thanks to the impact of online wholesalers like Amazon, leading to the closure of 8,000 brick-and-mortar stores across the United States.<sup>8</sup> This decline was exacerbated by COVID, where brick-and-mortar closures topped a record 12,200 in 2020.<sup>9</sup>



<sup>5</sup> Paul Schott, "The changing mall," Associated Press, last modified February 15, 2019, accessed March 15, 2023, <https://apnews.com/article/629b599cd3824f399739815555844903>.

<sup>6</sup> Paul Schott, "UConn-Stamford continues growth by offering students 'total package,'" Stamford Advocate, last modified May 2019, accessed March 14, 2023, <https://www.stamfordadvocate.com/business/article/UConn-not-taking-over-Stamford-Town-Center-13818332.php>.

<sup>7</sup> Tim Levin, "The decline of the American mall has left just 700 still standing. Soon there may be just 150 left.," Business Insider, last modified October 2022, accessed March 14, 2023, <https://www.businessinsider.com/american-mall-decline-150-left-10-years-how-many-2022-10#:~:text=In%202020%2C%20Coresight%20Research%20projected,would%20shut%20down%20by%202027.>

<sup>8</sup> Dennis Green and Megan Harney, "More than 8,000 store closures were announced in 2017 — here's the full list," Business Insider, last modified December 20, 2017, accessed March 15, 2023, <https://www.businessinsider.com/stores-closures-announced-in-2017-2017-12>.

<sup>9</sup> Phil Wahba, "A record 12,200 U.S. stores closed in 2020 as e-commerce, pandemic changed retail forever," Fortune, last modified January 7, 2021, accessed March 15, 2023, <https://fortune.com/2021/01/07/record-store-closings-bankruptcy-2020/>.





**ELLIOTT:** In order to figure out why, let's start by getting a better picture of how globalization has been accountable for the changing market structures of various industries. Joining us today is Charles Miranda, an online retail consultant. Charles, what role has e-commerce played in this massive industry shift?

**CHARLES:** To answer this question, we must first explore why e-commerce has become much more appealing to businesses than the retail stores we see in shopping malls. To open a physical store, you would need to contact venues to find spaces for lease, sign agreements with a location manager, and develop an attractive aesthetic store design. The operating costs for malls are high, with rent ranging between \$18 - \$30 per square foot per month.<sup>10</sup> Taking the low end of this spectrum and applying it to a small store—around 500 square feet—would entail \$9,000 being spent every month on rent alone.<sup>11</sup> Paying this high cost is reasonable if you are attracting consistent foot traffic; however, as that traffic falters, paying these costs yields a diminishing marginal return. On the other hand, anyone can easily start an online store with platforms like Squarespace and Wix, saving time and money that can instead be invested in more effective production and advertisement.

**ELLIOTT:** That's a considerable difference in operating costs.

**CHARLES:** Yes; that amounts to a difference of roughly \$100,000 a year.

**CINDY:** So, it seems like e-commerce has decreased the need for a brick-and-mortar storefront, which used to be a large barrier to entry for apparel companies. With an increase in the number of businesses, could you elaborate on how a digital business can more effectively connect with consumers?

**CHARLES:** Of course. Another reason for the success of e-commerce is its ability to cater directly to consumer needs. You may be familiar with the idea of browser fingerprinting, a tracking system that builds a specific profile based on your online activity and personal information. A team of academic researchers found that a quarter of the top 10,000

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<sup>10</sup> "How Much Does It Cost to Rent a Store in the Mall?" Peerspace, last modified January 2023, accessed March 14, 2023, <https://www.peerspace.com/resources/rent-store-mall/>.

<sup>11</sup> "How Much," Peerspace.

websites as ranked by Alexa Internet, a web traffic analytics company, utilized browser fingerprinting.<sup>12</sup> This precise tool kit makes it much easier for online retailers to advertise to the appropriate demographic.

**ELLIOTT:** What would this look like for a prospective business owner?

**CHARLES:** Let's say that someone is in desperate need of a fancy tie. A few decades ago, they would have no other option except to travel to a nearby mall. Yet, if they were to buy a tie today, a simple Google search would result in numerous options that would allow them to easily find tie producers that fit their specific needs. Producers are able to capitalize on a more unique market segment, allowing consumers with specific tastes to find suppliers who match their needs from around the world.

**CINDY:** Why else has e-commerce recently outpaced traditional retail?

**CHARLES:** Similar to the previously discussed lower barriers to entry, an additional reason that online stores have become so popular is that they allow producers to optimize business models. Take Shein, for example. Shein's fully-online business model frees up extra capital that would have been used to operate physical retail spaces in the traditional store-based business model. This extra capital allows Shein to produce and sell a larger volume and variety of items than its store-based competitors, such as H&M and Zara. Shein quickly capitalizes on the Internet trends of our ever changing attention economy, releasing up to 1,000 new items a day, according to the company's CEO.<sup>13</sup> In contrast, Zara adds new products to its line only once a week.<sup>14</sup>

**ELLIOTT:** I understand that Shein has the money to produce such a high volume of product, but how do they physically manufacture that many items in such a short period of time?

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<sup>12</sup> Catalin Cimpanu, "A quarter of the Alexa Top 10K websites are using browser fingerprinting scripts," ZDNET, last modified August 2020, accessed March 14, 2023, <https://www.zdnet.com/article/a-quarter-of-the-alexa-top-10k-websites-are-using-browser-fingerprinting-scripts/>.

<sup>13</sup> Priya Elan, "'Worst of the worst': why is fast fashion retailer Shein launching a reality show?," The Guardian, last modified August 29, 2021, accessed March 14, 2023, <https://www.theguardian.com/fashion/2021/aug/29/fast-fashion-retailer-shein-design-reality-show>.

<sup>14</sup> "Help-Shipping methods and pricing," Zara, accessed March 5, 2023, <https://www.zara.com/us/en/help/shipping-methods-and-pricing-h32.html>.

**CHARLES:** Well, I'm glad you asked. Shein has described its unique clothing production technique as "transformative." According to The New York Times, "it starts by ordering small batches of clothing (100 to 200 pieces) and monitors customers' response to those batches before placing larger orders."<sup>15</sup> This means Shein can take advantage of reduced operating costs through this sampling process. Along with the digital infrastructure of its website, Shein is able to facilitate the 24/7 availability of its goods, therefore making the shopping experience simpler and more convenient.

**CINDY:** So, the digital market reflects a new frontier for the retail industry as e-commerce is able to rival physical storefronts.

**CHARLES:** Yes, and the frontier will keep expanding. As digital marketplaces become cheaper to start, more fully online businesses will join the fold with even lower operating costs, pushing out current frontrunners like Shein.<sup>16</sup>



**CINDY:** Thank you, Charles, for your time and thorough analysis!

**CHARLES:** Any time.

**ELLIOT:** As e-commerce begins to grow in the U.S., malls throughout the nation are directly impacted. Now, let's take a deep dive into international malls and discuss how they are faring through this

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<sup>15</sup> Jessica Testa, "The People's Republic of Shein," The New York Times, September 9, 2022, sec. D, accessed March 14, 2023, <https://www.nytimes.com/2022/09/01/style/shein-clothing.html?searchResultPosition=2>.

<sup>16</sup> David Fickling, "Shein's \$100 Billion Valuation Is a Win for Fast Fashion," The Washington Post, last modified April 4, 2022, accessed March 14, 2023, [https://www.washingtonpost.com/business/sheins-100-billion-valuation-is-a-win-for-fast-fashion/2022/04/04/96252a40-b3f1-11ec-8358-20aa16355fb4\\_story.html&sa=D&source=docs&ust=1678044843806005&usg=AOvVaw1QmJKBiw5CZroymkqIPfnb](https://www.washingtonpost.com/business/sheins-100-billion-valuation-is-a-win-for-fast-fashion/2022/04/04/96252a40-b3f1-11ec-8358-20aa16355fb4_story.html&sa=D&source=docs&ust=1678044843806005&usg=AOvVaw1QmJKBiw5CZroymkqIPfnb).

transitional period. All of that and more to come right after this message from our sponsor: a simple, easy to use, all-in-one platform for starting your own online business.

**\*AD BREAK\***

**CINDY:** Welcome back everyone! We are joined now by Ryan Kaufman, an international e-commerce analyst. So, Ryan, what is the status of malls abroad? Are other countries experiencing a similar type of decline?

**RYAN:** Simply put, in certain countries, the answer is no. While the American mall industry is languishing, international shopping centers in many developing countries continue to thrive.

**ELLIOTT:** What explains the growth in foreign malls while American malls continue to fail?

**RYAN:** Well, in order to answer that, we have to analyze the presence of e-commerce in various countries. In the U.S., e-commerce, despite being a relatively new phenomenon, already makes up 9.7% of the entire retail market.<sup>17</sup> This share is outpacing the overall growth of the industry, directly encroaching on the space once dominated by malls. However, malls are not struggling in all parts of the world. Thailand, for example, is currently home to three of the world's top ten biggest shopping malls.<sup>18</sup> This is mainly due to the fact that their e-commerce market is not significantly harming malls, as it accounts for only 2% of total retail sales.<sup>19</sup> Similarly, India's emerging e-commerce sector, which accounts for only 3% of total retail sales, is still too underdeveloped to provide real competition for its malls.<sup>20</sup> In India, this lack of competition has allowed the mall industry to expand, and it is projected to see a

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<sup>17</sup> "2020 E-commerce Payments Trends Report: US," J.P.Morgan, last modified 2023, accessed March 14, 2023, <https://www.jpmorgan.com/merchant-services/insights/reports/united-states-2020>.

<sup>18</sup> "The 10 Biggest Shopping Malls In The World," WorldAtlas, last modified 2023, accessed March 14, 2023, <https://www.worldatlas.com/articles/the-biggest-shopping-malls-in-the-world.html>.

<sup>19</sup> "2020 E-commerce Payments Trends Report: Thailand," J.P.Morgan, last modified 2023, accessed March 15, 2023, <https://www.jpmorgan.com/merchant-services/insights/reports/thailand-2020>.

<sup>20</sup> "2020 E-commerce Payments Trends Report: India," J.P.Morgan, last modified 2023, accessed March 15, 2023, <https://www.jpmorgan.com/merchant-services/insights/reports/india-2020>.

nearly four hundred percent increase in revenue by 2028.<sup>21</sup>

**CINDY:** What factors account for differences in the popularity of e-commerce among different countries?

**RYAN:** The main factor that accounts for the success of e-commerce in a given country is how accessible the Internet is to a country's population. Internet accessibility requires capital and investment on a country basis, which creates discrepancies in e-commerce across nations. For example, in India, only 46.5% of the population uses smartphones, as compared to the United States' 81.6%.<sup>22</sup> Because India's population is less connected to the digital market, e-commerce is not as viable of an option, and as such, shopping malls in India are still extremely successful. However, this may not be the case for long, as e-commerce giants are investing billions of dollars to establish inroads in India. Because the Indian market has a large potential for success in e-commerce and is the recipient of large foreign investment, the rate of e-commerce growth in the country will likely skyrocket in the next few years. Due to the direct correlation between the lack of e-commerce in a country and the strength of its malls, the rise of e-commerce in India would most likely mean the end of the popularity of Indian malls.

**ELLIOTT:** If shopping malls are phased out as e-commerce grows, is there still a place for them in an increasingly digital world?

**RYAN:** There is, but not in their current form. In order for malls to survive, they will need to shift from retail to a new niche. Some malls are relying on the slow development of e-commerce in specific industries, such as food, to turn a profit. A study published in *The Journal of Economic Perspectives* projected that it will take the food and beverage industry until 2049 to be sufficiently digitized—where 90% of the sales occur digitally.<sup>23</sup> Due to that timeframe, some malls are able to continue to thrive without having to worry about e-commerce

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<sup>21</sup> "Retail sales in shopping malls to grow 29% annually to reach \$39 bn by FY28," *Business Standard*, last modified September 13, 2022, accessed March 15, 2023, [https://www.business-standard.com/article/economy-policy/retail-sales-in-shopping-malls-to-grow-29-annually-to-reach-39-bn-by-fy28-122091300535\\_1.html](https://www.business-standard.com/article/economy-policy/retail-sales-in-shopping-malls-to-grow-29-annually-to-reach-39-bn-by-fy28-122091300535_1.html).

<sup>22</sup> "Individuals using the Internet (% of population) - India," chart, 2023, <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=IN>.

<sup>23</sup> Ali Hortaçsu and Chad Syverson, "The Ongoing Evolution of US Retail: A Format Tug-of-War," *The Journal of Economic Perspectives* 29, no. 4 (Fall 2015), accessed March 14, 2023, <https://www.jstor.org/stable/43611012>.

encroaching upon their specific retail market. Many malls, especially in developing countries, have invested in expanding the allure of the dated, retail-centered American model. Mexican developers have embraced this food model approach, as well as incorporating children's entertainment among other amusement features to create the feeling of a town square. Whichever approach the industry pursues, it is clear, that in a world dominated by the digital marketplace, malls will no longer be able to rely solely on retail sales.

**CINDY:** Great insight and analysis Ryan, thanks for joining us today! Some American malls have also begun to adapt to this new age. Amidst the desertion of many anchor stores, the STC is attempting to revitalize its business model by welcoming entertainment, such as the recent addition of a comedy club.<sup>24</sup>

**ELLIOTT:** As our world develops, old things become obsolete. This natural progression leads to the redistribution of scarce goods, a healthy step towards societal advancement. The process of creative destruction has driven growth in new economic trends throughout our history. The rise of e-commerce has flooded the U.S. market and created a scarcity of malls that reflect current consumer tastes. Accordingly, consumers have gravitated toward online retail and entertainment.

**CINDY:** Indeed, change is a part of the globalization process. Last week, I was driving through White Plains, NY, when I passed the Galleria, a mall that is being converted into leasable apartment space. The \$650 million project, generally praised by the community, is expected to create hundreds of new apartments.<sup>25</sup>



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<sup>24</sup> Paul Schott, "Comedy club brings New York flavor and diversity to Stamford Town Center mall," CTInsider, last modified February 10, 2023, accessed March 14, 2023, <https://www.ctinsider.com/business/article/new-york-comedy-club-stamford-town-center-17746290.php>.

<sup>25</sup> Kate King, "In White Plains, N.Y., the Long Death of an Old Mall," Wall Street Journal, December 6, 2022, accessed March 15, 2023, <https://www.google.com/url?q=https://www.wsj.com/articles/in-white-plains-n-y-the-long-death-of-an-old-mall-116>



**ELLIOTT:** The future of the mall is uncertain; however, malls in their current form are antiquated. In order for an economy to progress, the reuse of capital is necessary. This might entail the transformation of current retail-based malls into a centralized hub hosting a variety of recreational activities and service providers. Or, it might mean demolishing malls to make room for compact housing. Regardless, the future of the mall is still yet to be seen, as globalization continues to guide the progression of our society.

**CINDY:** And that's all the time we have for today. I'm Cindy.

**ELLIOTT:** And I'm Elliott.

**CINDY:** And that's this week's episode of "Global-Eyes." See you all next week for another enthralling deep dive into global economic trends!





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# Hawthorne High School

Hawthorne, NJ

# Globalization Revolution: How Advancements in Technology Affect the Global Economic Landscape

**VALERIA:** Hello! Welcome back to another weekly episode on The EconoMix Talks, a podcast from three econ-passionate students that dive deep into the different forces that shape the economic environment. I am Valeria Melgar, and I am joined by my fellow peers, Greis Tozaj and Mishel Lamce. On today's podcast, we will talk about the Globalization Revolution. We will discuss and analyze how the latest advancements in technology and Artificial Intelligence will affect the global economic landscape and the implications for countries and businesses worldwide.

**GREIS:** Tech is everywhere. I start my day by asking Siri what time it is, and I end it by asking Siri again to set up the alarm.

**VALERIA:** Don't we all do that? We are surrounded by technology, and it is affecting our lives even in small things, but the impact on the global economy will be much more significant.

**MISHEL:** For sure. The latest technological advancements have been among the most popular topics these last few months. Indeed, throughout the years, technology has facilitated business-making across borders, but now, these advancements, mainly in artificial intelligence and robotics, are more rapid. So what will this impact on the global economy and globalization be, and what will the future look like? To answer these questions, let's start by looking at some of the key ways AI and technology affect companies, markets, and countries.

**GREIS:** AI is changing how companies operate and has created new opportunities for growth and innovation. It has enabled businesses

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to automate tasks, making production and services time and cost-efficient. Additionally, companies now have access to more data and information, allowing them to make more informed decisions. Forbes has indicated that from 2010 to 2020, the amount of data consumption worldwide increased by 5,000%, from 1.2 trillion gigabytes to 59 trillion gigabytes (Press).

***AI is changing how companies operate and has created new opportunities for growth and innovation***

**VALERIA:** Whoa! That is a massive amount of data.

**GREIS:** I know, right? And much of the data is stored in cloud systems, which enable businesses to operate across multiple global locations.

**VALERIA:** Thank you for bringing that up. I hear now everyone talks about cloud systems; even all my cell phone data is stored in the cloud. Can you give us more information on cloud computing and its effect on global business operations?

**GREIS:** Sure. Cloud computing delivers computing services such as databases, servers, networking, etc., over the cloud or the Internet and offers flexible resources, faster innovation, and economies of scale. It is a significant factor in globalization and how companies operate in multiple locations today. A quote by Mariano Ammirabile, author of Cloud computing news from IBM, best explains the relationship between cloud computing and globalization. In an article, he said that “Cloud is certainly a form of globalization” (Ammirabile). This is because the different types of cloud services, such as Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS), provide businesses with a scalable infrastructure that can be accessed from anywhere in the world. Companies can deploy virtual storage, servers, and applications in the cloud, which provide an opportunity for global collaboration and work on multiple-locations projects (*IaaS vs. PaaS vs. SAAS*). This is as globalized and interconnected as the world can get. Basically, the cloud allows businesses to operate without borders.

**VALERIA:** It certainly does. And having such infrastructure available improves companies’ productivity, leads to economic growth, and increases the international movement of services, information, technology, and goods. International trade is another component of globalization, and technology is making it easier for businesses to trade

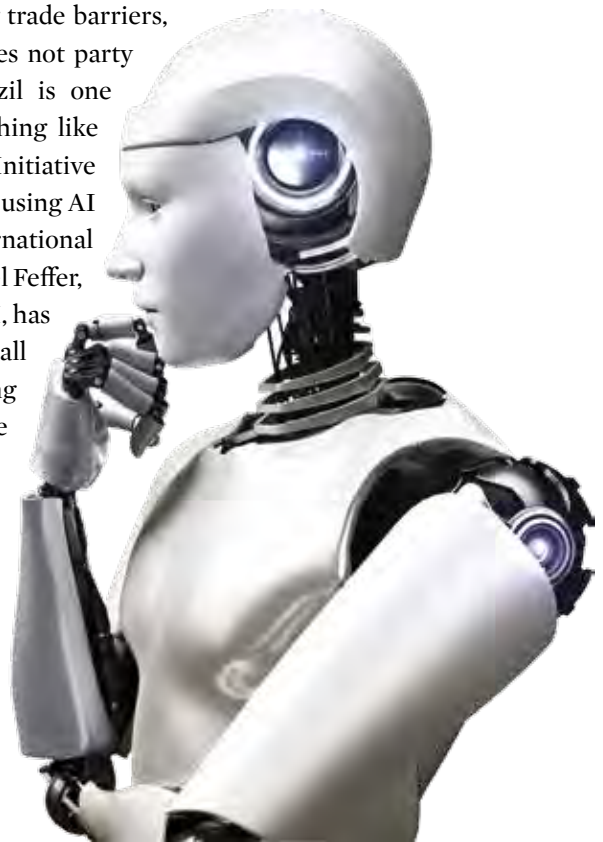


goods and services globally, reduce costs, and increase efficiency. Greis, please give us more insight on this.

**GREIS:** Of course. The first thing is that productivity growth from the implementation of AI systems and processes can increase the economic growth of companies and countries, which after that will pave the way for new opportunities for international trade. There are also more specific applications of tech and AI to international trade. For example, AI can be used to improve global trade negotiations by analyzing economic trajectories, adjusting trade barriers, and predicting trade responses from countries not party to the negotiation (Meltzer). Actually, Brazil is one of the countries that has established something like this called the Intelligent Tech & Trade Initiative (“*BUILDING ITTI*”). This initiative includes using AI to improve trade negotiations and takes international trade beyond the traditional roadblocks. Daniel Feffer, ICC Brasil’s chairman and the founder of ITTI, has said that “AI and blockchain can help both small and medium-sized enterprises and emerging markets seize a bigger piece of the global trade pie” (“*ICC Brasil and Unctad*”).

**VALERIA:** You’re right. ITTI has built prototypes in partnership with UNCTAD and IBM to use in complex negotiations. I believe they called a prototype the Cognitive Trade Advisor, and it emerged from actual trade talks between the South American trade bloc Mercosur and Canada (“*Small economies welcome AI*”).

**GREIS:** Yes, and AI is becoming smarter as time passes because we also have more data available. I think technology, AI, blockchains, and robotics are the ultimate game-changers. Going back to 2020, COVID-19 actually brought to light the vulnerability of supply chains. We can minimize the risks now because technology can enable more proactive supply chains. Machine learning models can predict customer behavior, can foresee demand, and it can calculate cheaper and faster routes (“*BUILDING ITTI*”). AI *has* the ability to uplift international trade.



**MISHEL:** Let's not forget about the digital platforms. We can buy things from everywhere on Amazon or eBay. And speaking of, I bought some Italian chocolates yesterday with just a click on my phone. These platforms make it easy for companies to do business globally. Brookings Magazine stated that "In the U.S., 97 percent of small businesses on eBay export, compared to just 4 percent of offline peers." The difference is visible, and the opportunity is unprecedented.

**GREIS:** Digital platforms also have implemented AI translation services, which facilitate global trade. Research analyzing the effect of the introduction of eBay Machine Translation (eMT) on eBay's international trade reflected direct causal links between AI adoption and economic activities. It found that eMT increases U.S. exports to Spanish-speaking Latin American countries by 17.5%-20.9% on eBay (Brynjolfsson et al.).

**VALERIA:** Increased automation, prediction of trends, increased accuracy, cost calculation, translation services, cloud services and more all fall under the umbrella of technology and all are helping companies expand globally and increase the interconnection between different countries, without barriers. However, as with everything, there are challenges coming from rapid changes. What are some of the challenges that technology brings in the global economic environment?

**MISHEL:** One of the highly debated challenges is the disruption of the labor market. Automation technologies can displace workers in industries that can be automated. The McKinsey Global Institute expects that "job profiles characterized by repetitive activities or that require a low level of digital skills could experience the largest decline as a share of total employment to around 30 percent by 2030, from some 40 percent" (Bughin et al.). For sure, some jobs will be replaced, but these changes will create new job opportunities. Requirements for jobs will change, and thus, people will need to learn new skills to adapt to these changes. There will be new jobs in areas related to technology, and the creativity of humans will always be needed. Anu Madgavkar, a partner at the McKinsey Global Institute, said in an article discussing what jobs ChatGPT will replace that "We have to think about these things as productivity enhancing tools, as opposed to complete replacements" (Mok). This is true because there will be jobs that need emotional intelligence and interpersonal skills that machines cannot do better than humans.

**VALERIA:** Another way that technology is influencing the global economic landscape is through increased competition and innovation. Companies are under increasing pressure to stay competitive by adopting new technologies and business models as they gain access to new markets and customers.

**GREIS:** That brings us to another challenge, which is placing the power in the hands of a few players. Artificial intelligence and technology have a tendency to create natural monopolies, resulting in a small number of big companies that are based in a few wealthy nations yet support the whole global economy (Korinek and Stiglitz). The McKinsey Global Institute also argues that the performance gap between early adopters (businesses that completely integrate AI tools across their operations over the following five to seven years) and late adopters could be exacerbated by AI technologies (Bughin et al.). It states that “front-runners, by 2030, could potentially double their cash flow. At the other end of the spectrum, nonadopters might experience around a 20 percent decline in their cash flow from today’s levels, assuming the same cost and revenue model as today” (Bughin et al.).

**VALERIA:** Adding to the McKinsey findings, there is currently a digital division between countries, and AI might widen gaps even more. McKinsey estimates that “leading AI countries could capture an additional 20 to 25 percent in net economic benefits, compared with today, while developing countries might capture only about 5 to 15 percent” (Bughin et al.).

**GREIS:** PWC also has found in a study that “the greatest economic gains from AI will be in China (26% boost to GDP in 2030) and North America (14.5% boost), equivalent to a total of \$10.7 trillion and accounting for almost 70% of the global economic impact” (Rao and Verweij). PWC estimates that \$15.7 trillion will be the contribution of AI to the global economy, \$6.6 trillion is likely to come from increased productivity, and \$9.1 trillion is likely to come from consumption side



**Automation technologies can displace workers in industries that can be automated.**

effects. However, all countries should see a positive impact (Rao and Verweij).

**MISHEL:** These are some interesting insights. What else do you think the future will hold?

**GREIS:** Many studies and experts have revealed some other predictions about the impact technology will have. Accenture, for example, a leading global professional services company, has published a research study that includes 12 developed economies, comprising more than 50% of the global economic output, and shows that AI will double the global economic growth rate. The report explains that by 2035 the impact of AI technologies on business is projected to boost labor productivity by up to 40 percent because it will change how work is done and reinforce people's role in driving business growth. Accenture also found that the productivity increase will reduce the number of years required for the 12 countries included in the analysis to double in size (*"Artificial intelligence poised to double"*). This is a great impact; everything is part of a chain in the economic landscape. The growth of one country's economy affects how it will operate on an international scale; thus, we will see a direct effect on the economics of globalization.

**VALERIA:** Technology has a crucial impact on companies and national economies that are connected together and play a role on the global stage. With all the changes it will have, the future holds exciting things for us to see.

**ALL:** Thank you all for listening!

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Front row (left to right) Akshaya Karanam, Lilian Del Rossi, Isabelle Fretz, and Victoria Fekete  
Back row (left to right) Katherine Ferris, Charlotte Jotz, Nina Heim, and Zoe Daly

# Mount Saint Mary Academy

Watchung, NJ

# Goodz Gone Global: The International Success of Acai

*(door opens)*

**WORKER:** Hi! Welcome to Playa Bowls, what can I get for you?

**CUSTOMER:** Can I have the acai bowl with pineapple, coconut flakes, chia seeds, and honey drizzle?

**WORKER:** Coming right up!

*(sound of smoothie machine whirring)*

**MAGGIE:** You just spent \$15 on your morning acai bowl, but do you know what made that blend possible?

**AMANDA:** One word: Globalization. Around 80% of the world's population relies on imported food.<sup>1</sup> Globalization has allowed you to eat your favorite foods, like pineapples from Costa Rica and coconuts from Indonesia, regardless of season or origin.



**MAGGIE:** Thanks to improved transportation and reduced trade barriers, America is no longer solely fed by Midwestern farmers, but by foods unique to countries across the world. The

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<sup>1</sup> "Study: 80% of the World's Population Is Dependent on Imports to Meet Their Food and Nutritional Requirements." Refrigerated Frozen Foods RSS. Refrigerated & Frozen Foods, October 1, 2019.

*The interview portrayed in this paper is a product of the authors' imagination. While the interview may reference actual people, the subject matter and language attributed to those people is entirely fictitious.*





***Acai has been harvested for food and medicinal purposes in the Amazon rainforest for centuries, mainly by families and small farms.***

globalized food industry has allowed foods to be enjoyed at historically low prices and provided greater food variety for communities worldwide,<sup>2</sup> but at what cost?

**AMANDA:** Welcome to today's episode of Goodz Gone Global where we investigate how globalization impacts our daily lives. I'm your host, Amanda Sinclair, and today we'll discuss how acai transformed from an Amazonian staple into an international sensation. This small berry has come a long way from its home in Brazil, traveling over 4,000 miles before making it to our shelves (and bellies) in the U.S. But acai is just one example of a far-traveling food, as the average pound of food travels over 1,200 miles before reaching the home of the consumer.<sup>3</sup> Today, we're joined by Maggie Freidman, an economist who specializes in global trade in the agricultural industry. Maggie, let's dive right in! Tell us more about the globalization of this antioxidant powerhouse.

**MAGGIE:** Hi! I am beyond excited to be here discussing acai. The story of acai is a great illustration of a local product expanding into a global market. Acai has been harvested for food and medicinal purposes in the Amazon rainforest for centuries, mainly by families and small farms. But, it didn't take off in the U.S. until the year 2000, when two American brothers, Ryan and Jeremy Black, discovered acai while visiting Brazil. They saw an opportunity to commercialize the fruit and deliver it to people around the world, and that they did: their company, Sambazon, is now a leading wholesale supplier of acai and has distribution networks across the U.S., Canada, Mexico, Korea, Taiwan, and Japan.<sup>4</sup>

**AMANDA:** That's so interesting! It certainly sounds and feels like acai is everywhere. How did it become so popular?

**MAGGIE:** Social media! As platforms like Instagram and Facebook grew, information spread more quickly and reached larger audiences. Acai's popularity is largely based not on traditional advertising, but on

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<sup>2</sup> Ambikapathi, Ramya, Kate R. Schneider, Benjamin Davis, Mario Herrero, Paul Winters, and Jessica C. Fanzo. "Global Food Systems Transitions Have Enabled Affordable Diets but Had Less Favourable Outcomes for Nutrition, Environmental Health, Inclusion and Equity." *Nature News*. Nature Publishing Group, September 19, 2022.

<sup>3</sup> Bray, Siobhan. "The Global Food System." *The Good, the Bad, and the Ugly of the Global Food System* - The Regis, 2015.

<sup>4</sup> U.S. Government's Global Hunger & Food Initiative. "How One Small Business Helped Make the Rainforest 'Too Valuable to Cut down.'" *Feed the Future*, March 27, 2015.

celebrity endorsements. When acai was initially introduced to America, it was confined to the surf communities of Hawaii and Southern California.<sup>5</sup> But once celebrities shared pictures of their acai bowls online, the craze spread rapidly thanks to the global reach of social media platforms. Acai also came with a string of alleged health benefits, boasting anti-cancerous properties and even claiming to lower the risk of age-related brain diseases.<sup>6</sup> Its trendy status, coupled with the fruit's appeal as an aesthetic snack and superfood left everyone wanting to try the small berry. The market quickly grew nationwide as chains like Playa Bowls began to pop up in 2014 with their unique takes on the acai bowl. Large social media platforms have led to over 3 million posts with the #acai, and in 2021 the acai market was valued at US \$5 billion, and expected to grow!<sup>7</sup>

**AMANDA:** Acai is no stranger to my social media feeds...I see celebrities post it daily! My biggest question is how does acai get from Brazil to my smoothie shop in America? Maggie, I understand you visited a town in Brazil to see this process for yourself. Can you share what you discovered?



**MAGGIE:** Of course. I recently traveled to Curralinho to do a deeper dive into the acai supply chain, where I had the opportunity to interview an acai farmer, Marcos. Here's what he had to say...

**MARCOS:** In my community, we now call acai "black gold." It has always been a major part of our diet, but until recently, us farmers used to only sell the fruit at roadside stands after we harvested it.

**MAGGIE:** Can you tell me about the harvesting process?

**MARCOS:** Sure. To reach the fruit we climb 80-foot trees that are skinny and very breakable. Once we reach the top, we swing from the

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<sup>5</sup> tnbr\_adm. "History of the Acai Bowl - Tambor®: A Passion for Premium Açai." Tambor® | A PASSION FOR Premium Açai, March 3, 2014.

<sup>6</sup> Butler, Natalie. "Acai Berries: Health Benefits, Nutrition, Diet, and Risks." Medical News Today. MediLexicon International, 2018.

<sup>7</sup> "ACAI Berry Market: Global Industry Analysis and Forecast (2022-2029)." MAXIMIZE MARKET RESEARCH, March 1, 2023.

tree to grab the berry bunches while also being careful to not break the delicate fruits.

**MAGGIE:** Wow! That sounds dangerous.

**MARCOS:** It is. Around half the harvesters I know have gone to the hospital because of this job.<sup>8</sup> Being light and nimble is an advantage when it comes to climbing, so often children will start at a young age and step in to help their families.

**MAGGIE:** Does the risk of injury ever make you question being a harvester?

**MARCOS:** While there's risk, I don't know what my community would do without these jobs. A majority of us depend on the income from harvesting acai, especially since it has become more popular.<sup>9</sup>

**MAGGIE:** Speaking of popularity, it has really taken off in America! People pay crazy prices just to get a taste. I've seen bowls the size of my hand sell for 80 reals, or 15 U.S. dollars, so I imagine there's been some sort of wealth gain for you guys.

**MARCOS:** 80 reals for a bowl? We sell an entire basket for 60.<sup>10</sup> Twenty years ago, the market for acai was much smaller, as we only provided for our communities.<sup>11</sup> Then, all of a sudden everyone wanted acai and harvesting became a better way to support my family. We are paid by the number of baskets filled, and with increased demand, we sell more, so we are paid more.<sup>12</sup> Our daily income is heavily dependent on natural conditions and timing though.

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<sup>8</sup> McCoy, Terrence. "Small Children Are Climbing 60-Foot Trees to Harvest Your Açaí." *The Washington Post*. WP Company, November 28, 2021.

<sup>9</sup> "Top 3 Emerging Trends to Impact the ACAI Berry Market in the next Five Years: Technavio." *Top 3 Emerging Trends to Impact the Acai Berry Market in the Next Five Years: Technavio* | Business Wire, September 8, 2017.

<sup>10</sup> Choy, Amanda, Chris Panella, and Barbara Corbellini Duarte. "Farmers in Brazil Are Risking Their Lives to Harvest Açaí - but They've Been Left out of the Profits from the Trendy Berry's Popularity." *Business Insider*. Business Insider, January 11, 2023.

<sup>11</sup> Ionova, Ana. "Brazilian 'Wonder Berry' Offers Farmers and the Amazon a Future." *The Christian Science Monitor*. The Christian Science Monitor, December 8, 2021.

<sup>12</sup> Choy, Amanda, Chris Panella, and Barbara Corbellini Duarte. "Farmers in Brazil Are Risking Their Lives to Harvest Açaí - but They've Been Left out of the Profits from the Trendy Berry's Popularity." *Business Insider*. Business Insider, January 11, 2023.

**MAGGIE:** Timing? What do you mean?

**MARCOS:** After harvesting, we only have 48 hours to sell before the berries go to waste.<sup>13</sup> And we don't sell directly to the big companies you buy from, but to middlemen,<sup>14</sup> at prices much lower than the ones you mentioned. After that, it gets sold to the people whom I imagine really profit off of our work.

**MAGGIE:** Thank you for your time Marcos - we appreciate your insight. Marcos' experience is one similar to over 120,000 families in Brazil who harvest acai,<sup>15</sup> whose standards of living have been raised thanks to acai's popularization, though it remains back-breaking work. The FIEPA reported that in the past ten years, exports have grown over 14,000%,<sup>16</sup> and local farmers are now selling to a global market. Production, collection, and processing techniques have also improved thanks to reinvestment from funds created by acai's global popularity.

**AMANDA:** Wow, so is the expansion of the acai market leading to new opportunities for people in Brazil?

**MAGGIE:** Yes. Employment growth in the regional acai economy was estimated at 12 percent from the mid-1990s to 2011, and that was before acai really took off in the US.<sup>17</sup> And, because harvesting often only requires one tool, a peconha, or rope, the upfront costs are close to zero, making the barriers to entry in the acai market low. Since it's relatively easy to enter the market, it makes sense that the increased demand for acai resulted in an increased derived demand for more harvesters.

**AMANDA:** Is there enough acai for all of these new harvesters to make a living?



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<sup>13</sup> Choy, Amanda, Chris Panella, and Barbara Corbellini Duarte. "Farmers in Brazil Are Risking Their Lives to Harvest Açai - but They've Been Left out of the Profits from the Trendy Berry's Popularity." Business Insider. Business Insider, January 11, 2023.

<sup>14</sup> Sambozen. "Impact Report 2021." SAMBAZON, 2021.

<sup>15</sup> McCoy, Terrence. "Small Children Are Climbing 60-Foot Trees to Harvest Your Açai." The Washington Post. WP Company, November 28, 2021.

<sup>16</sup> "Top 3 Emerging Trends to Impact the ACAI Berry Market in the next Five Years: Technavio." Top 3 Emerging Trends to Impact the Acai Berry Market in the Next Five Years: Technavio | Business Wire, September 8, 2017.

<sup>17</sup> S. Brondizio, Eduardo. "The Global Açai: A Chronicle of Possibilities and Predicaments of an Amazonian Superfood." October 2021.

**MAGGIE:** Well, acai is a naturally abundant resource in the Amazon with over 100 trees per hectare.<sup>18</sup> Plus, it only takes a few years for acai trees to start producing berries. However, there isn't enough land. In order to meet global demand, farmers are planting over 1,000 monocultures of acai per hectare, where there should only be 70. In an effort to reduce biodiversity loss that can accompany this overplanting, the Pará State environmental department instructed small farmers to harvest a maximum of 200 palms per hectare.<sup>19</sup>



**AMANDA:** Wow. I always assumed acai was more sustainable!

**MAGGIE:** Well, acai extraction does fulfill the United Nations guidelines for Sustainable Development, as long as it's regulated.<sup>20</sup> It's also less destructive than the jobs in logging and cattle ranching that many in Brazil would likely engage in if not for the growth of the acai market. And this shift towards acai is also economically beneficial for workers. A grower's income is much higher than earnings by those in sectors like livestock and logging.<sup>21</sup>

**AMANDA:** On the topic of income, Marcos mentioned that children get involved in the harvesting process in order to bring in money to support their families. Is this common?

**MAGGIE:** Very. Although Brazil has child labor laws on the books, over 70% of workers in acai harvesting towns like Ponta de Pedras are not formally contracted,<sup>22</sup> making it harder to regulate child labor in the industry. It's important to enforce policies to protect these children, and all workers in the future.

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<sup>18</sup> Nobre, Carlos. "Brazil's Fruitful Example: Açaí." World Resources Institute, October 12, 2017.

<sup>19</sup> Camargo, Suzana. "Your Açaí Smoothie May Be Destroying Floodplain Forests in the Amazon." Mongabay Environmental News, November 3, 2021.

<sup>20</sup> Cruz, Mikka. "Sustainable Harvests Are Strengthening Communities in Colombia." Business Call to Action. Business Call to Action, April 8, 2021.

<sup>21</sup> Nobre, Carlos. "Brazil's Fruitful Example: Açaí." World Resources Institute, October 12, 2017.

<sup>22</sup> Lima, Viviana Mendes, Sandra M.F. Costa, and Helena Ribeiro. "Globalization and Health in a Small Town in the Amazon Region." IntechOpen. IntechOpen, November 5, 2018.

**AMANDA:** Well, we know the role farmers play in harvesting the acai berries, but there's a big difference between berries in baskets and the smoothies I buy. And, according to Marcos, there's a major price difference as well. Can you tell me about the events that take place from fruit to table?

**MAGGIE:** Well, after Marcos' work is done there is still a long way to go. Although processed acai sells for \$7+ a pound here in the U.S., farmers like Marcos generally sell a pound of berries for about 20 cents.<sup>23</sup> This is because the middlemen sell it to companies who bring the berries to processing facilities. It's here where the berries are turned into pulp and frozen and the price of acai jumps 177%.<sup>24</sup> After this, the frozen blocks can then be shipped to international and national markets.

**AMANDA:** I've definitely seen frozen acai packets at my local supermarket.

**MAGGIE:** I'm not surprised. Acai has been transformed into thousands of products to appeal to a wider audience. In fact, it has even been used for candles! Walmart.com alone has over 400 different active items in its catalog that contain acai!<sup>25</sup> Even things like home decor and pet food have come to embrace the acai trend.

**AMANDA:** Wow—talk about global reach! But to bring it back to its main use, today we are pleased to have Ricardo Perdigao, CFO of one of the largest acai companies in the world: Sambazon. Ricardo, thank you for joining the conversation to give our listeners a behind-the-scenes look into the global supply chain of acai.

**RICARDO:** Thanks for having me! We are the leading exporter of frozen acai; our company exports 60% of the global acai market.<sup>26</sup> We're happy to see that the market is growing steadily, especially since

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<sup>23</sup> Choy, Amanda, Chris Panella, and Barbara Corbellini Duarte. "Farmers in Brazil Are Risking Their Lives to Harvest Açai - but They've Been Left out of the Profits from the Trendy Berry's Popularity." Business Insider. Business Insider, January 11, 2023.

<sup>24</sup> Ibid.

<sup>25</sup> "Walmart." Walmart.com, 2023.

<sup>26</sup> "Sambazon. "Global Açai Market Leader Sambazon to Switch to Plant-Based Packages by 2025." PR



the U.S. market alone is projected to be worth \$2.1 billion dollars by 2027.<sup>27</sup>

**AMANDA:** That's incredible!

**RICARDO:** It sure is, and it doesn't end there. Between 2019 and 2020, in just one year, the market grew 51%.<sup>28</sup> Globalization has enabled the entire market to thrive. Without it, there is no way our company could have expanded to be the global enterprise it is today. Here at Sambazon we are excited to see where the future will take us.

**AMANDA:** It certainly sounds like you folks at Sambazon love globalization! But Ricardo, I have to be honest, other globalized industries are known to come with negative aspects like environmental harm and worker exploitation. Is this common in the acai industry?

**RICARDO:** Workers in emerging markets are often exploited for their labor or raw materials. In the case of acai production, farmers, who are at the base of the supply chain, can be taken advantage of as they sell the berries to a chain of middlemen until the berries reach an industrial manufacturer. However, Sambazon has a vertically-integrated supply chain for the berries. We directly purchase berries from the harvesters and process them into frozen pulp at our processing center in Amapá, Brazil.<sup>29</sup> In accordance with this chain of custody, our company is proud to hold Fair Trade certification, which means that we promote both environmental and social sustainability. As a part of the Fair Trade certification, we set our prices according to harvesting communities' cost of living and pay a premium to the harvesters.<sup>30</sup>

**AMANDA:** So what does this mean for the harvesters and workers?

**RICARDO:** We buy acai from harvesters for 10 times more than base price and pay our factory workers a fair wage that covers the cost of living in the area.<sup>31</sup> The label indicates transparency in our supply

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<sup>27</sup> Itd, Market Data Forecast. "Acai Berry Market: Size, Share, Growth: 2022-2027." Market Data Forecast, January 2022.

<sup>28</sup> Malheiros, Posted by Gabriel. "Brazilian Açai Exports Grow 15,000% in Ten Years." Datamar News, November 28, 2022.

<sup>29</sup> Sambozen. "Impact Report 2021." SAMBAZON, 2021.

<sup>30</sup> Fairtrade International. "Fairtrade Standards." Fairtrade International. Accessed March 12, 2023.

<sup>31</sup> Sambozen, "How Well Do You Understand Fair Trade?" Sambozen, 2019.

chain so consumers can be informed and farmers can reap the benefits that come from global expansion.

**AMANDA:** Can you talk a little more about these added benefits? What does Sambazon specifically do?

**RICARDO:** One of the goals of the Fair Trade initiative is fostering long-term, sustainable growth in the communities. A percentage of our profits are set aside each year for projects that help the entire harvesting community. For example, Sambazon saw a need in the city of Afuá, so our Fair Trade Committee proposed a community center that tends to dental and medical care and provides education.<sup>32</sup> Efforts such as this one have increased the standard of living for harvesting communities and expanded educational opportunities for children in Brazil. To date, our company has provided over one million dollars toward projects for the people in the communities, ultimately serving more than 2,400 families.<sup>33</sup>

**AMANDA:** Wow Ricardo, I'll give you credit for that one! Thank you for your input today! There's no denying that acai's social media superstardom and supposed plethora of health benefits helped it find global success, but its rapid climb has me wondering, will acai become just another trend we will cycle through?

**MAGGIE:** In an era dominated by fast fashion and ever-changing trends it's not hard to envision a near future where acai is replaced by the newest craze. In the last year, social discussions involving acai have fallen by 57%, suggesting that the trend that once dominated social media, may no longer be trending.<sup>34</sup> This raises new questions, what will become of communities that depend on income generated from acai harvesting? And what region will be the next to benefit from the world's short attention span?

**AMANDA:** It seems that only time will tell. Now, does anyone want to get a smoothie? All this acai talk has made me hungry!

***In an era dominated by fast fashion and ever-changing trends it's not hard to envision a near future where acai is replaced by the newest craze.***



<sup>32</sup> Bixby, Kirra. "Our 2020 Fair Trade Project: Araramã Community Center." SAMBAZON. SAMBAZON, February 23, 2023.

<sup>33</sup> Sambozen. "Impact Report 2021." SAMBAZON, 2021.

<sup>34</sup> "Acai Consumption Trends, Analysis and Statistics 2023 Report." Tastewise, 2023.



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Left to right: Anina Ghosal, Raghav Raj, and Lucy Hart

# Niskayuna High School

Niskayuna, NY

# Generous Electric: How General Electric's Globalization Lights and Hauls the World

## [INTRO]

*Hello and welcome to The Schenectady Marketplace, a podcast that examines the opportunities and challenges facing Schenectady businesses in the global marketplace, featuring interviews with entrepreneurs and industry experts navigating the complexities of international trade and investment. Today, we have a special guest, Brian Gutknecht, the marketing leader at GE Gas Power. Brian, thank you for joining us today.*

**BRIAN:** Thank you for having me.

## [MAIN]

**LUCY:** Every Schenectady resident recognizes the neon glow of the General Electric (GE) monogram. Its constant radiance is as ingrained in the town as General Electric is. There is no Schenectady without GE. In 1892, Thomas Edison moved General Electric, known then as the Edison Electric Company, from Lynn, Massachusetts to Schenectady, New York. At its new headquarters, Edison transformed General Electric into the company as we know it today. With GE at its side, Schenectady grew rapidly, gaining the title “The City that Lights and Hauls the World.” (“General History”) According to the Daily Gazette, “About 30,000 people worked on the sprawling Schenectady/Rotterdam campus at the start of the Great Depression and about 32,000 in 1950, after the all-out effort for World War II swelled the workforce to 45,000.” (Cropley) This shows the immense impact GE had on Schenectady’s economy and population.

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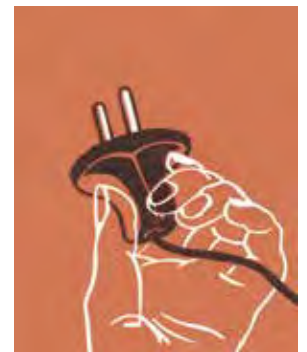
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MLA 9th Edition



**RAGHAV:** But the thriving relationship between the city and the company wouldn't last. The Daily Gazette also reports that between 1981 and 2001 the employment at the Schenectady campus dropped from 24,000 to 6,700. In 2011, the then GE CEO, Jeff Immelt, moved the General Electric headquarters from Schenectady to Atlanta, Georgia. By 2019, only 4,000 people were employed across the Schenectady and Niskayuna campuses. (Cropley)

***To be successful, companies need to balance their global industry expertise with a deep understanding of local markets and customer needs.***

**ANINA:** Despite GE's scaling back in the area, in 2011, General Electric's Global Growth Organization (GGO) made its debut. It was a result of Immelt's effort to grow GE's global presence and spread GE's contributions internationally.

**LUCY:** For those tuning in, can you elaborate on what the GGO is?

**RAGHAV:** Definitely. The GGO is an ambitious undertaking, involving significant investments in new markets and industries around the world, as well as a shift in the company's business model. GE began to focus more on services, rather than solely on manufacturing and selling products.

This meant that the company could generate revenue by providing maintenance, repair, and other services for the products it sold, rather than relying solely on the initial sale. The GGO allows GE to have local insight into markets around the world. (Mullock)

**BRIAN:** There's a lot of value in having expertise in these local regions. We have executives in every major country of business. They have relationships with the local governments, and context into local business leads—company to the country. These structures rely on local capabilities around the world which is a huge strength for us and tells us the local codes and standards.

**ANINA:** What are some impacts that the GGO has had?

**LUCY:** The GGO has transformed GE into a more globally integrated organization by breaking down silos, business units that operate autonomously and refrain from sharing information, and creating a more collaborative and connected network. GGO has been working to create a more diverse and inclusive culture that values different perspectives and ideas. This has included initiatives to recruit more

diverse talent and foster a more inclusive work environment. (Ashkenas)  
Former GGO CEO John G. Rice has stressed the importance of local knowledge and speed in developing solutions and business models for diverse markets. (Rice)

**RAGHAV:** Exactly. To be successful, companies need to balance their global industry expertise with a deep understanding of local markets and customer needs. Rice cites the example of GE's investment in a flexible manufacturing facility in Pune, India, which can build different products for multiple businesses using shared infrastructure, equipment, and people. The facility is spread over 68 acres and its advanced technology allows it to produce these products with exceptional quality and accuracy. The \$200 million investment has paid off, as the facility has helped GE secure new business, including a \$2.5 billion India Rail deal. Rice also emphasizes the need for companies to move quickly and align their local capabilities with their global scalability. In the highly competitive Indian market, GE's investment in a versatile manufacturing facility has given the company a competitive advantage by demonstrating its adaptability and local capacities across various industries. (Rice)

**BRIAN:** I'd also like to mention that having these executives in different countries helps make technology implementation more efficient. Because our executives can get local insight into a country's codes and regulations, it makes it easier to understand how different GE technologies can be used all around the world most efficiently.

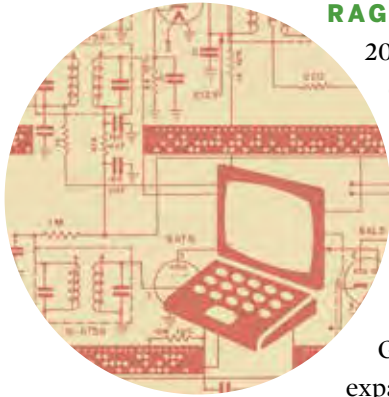
**ANINA:** And GE implemented this structure in other regions, right?

**LUCY:** That's right! In addition to its investments in India, GE also expanded its operations in China, Mexico, and other emerging markets around the world. The company established partnerships with local companies and organizations, helping it to better understand local customs and practices, and to adapt its products and services to meet the needs of customers in different regions. (Mullock)

**ANINA:** Could you tell us some of the numbers behind the GGO's progress?







***Staying competitive is vital to the success of GE and other global companies; it allows companies to employ the most efficient and updated technology and strategies to run their business successfully.***

**RAGHAV:** Since the establishment of GE's GGO in January 2011, the revenues generated by GE's industrial businesses outside of the United States (as of September 2017) have increased to \$67 billion. This comprises 59% of their total worldwide revenue, up from \$46 billion, or 54% of their total. The order backlog outside the United States has also increased to \$232 billion, representing 72% of their total, up from \$112 billion, or 64% of their total, during the same period. Overall, the Global Growth Organization was a major success for GE. By expanding its reach and diversifying its revenue streams, the company was able to weather the volatility of the global markets and maintain its market share in the face of increased competition. The shift towards services helped to provide a more consistent revenue stream and allowed GE to differentiate itself from its competitors. (Gulati)

**BRIAN:** GE's globalization has allowed us to stay competitive which boosts all businesses in the sector and the global economy. Staying competitive is vital to the success of GE and other global companies; it allows companies to employ the most efficient and updated technology and strategies to run their business successfully.

**LUCY:** Surely the GGO faced some obstacles; it must have been difficult to find the balance between satisfying local needs and maintaining an organization on a worldwide scale.

**RAGHAV:** That's true. The company faced significant cultural and logistical hurdles in adapting to new markets, and it had to navigate complex regulatory and legal frameworks in different regions. While the GGO was largely profitable, GE faced challenges with cultural differences and resistance to change. For example, employees may be used to working independently and may struggle to adjust to a more collaborative environment. (Mullock)

**LUCY:** And there were many strategies behind GE's fast emergence. GE has created a "digital thread" that connects its various businesses and functions around the world. This gave them the ability to share data and insights more quickly and collaborate on projects more effectively. In the future, GE envisions a self-improving, connected supply chain operating through a digital thread in real time. This will allow for enhanced product design, manufacturing processes, and

logistics, with data fed back instantaneously to make modifications and improvements. (Furstoss)

**RAGHAV:** Yes! And as technology continues to drive manufacturing competitiveness, the digital thread and its feedback loops will become even more pervasive. However, challenges still exist, such as the need for interoperability standards and advancements in sensing hardware and equipment flexibility. What results is data-driven manufacturing solutions and the unlocking of the huge benefits promised by smart manufacturing. (Furstoss)

**ANINA:** What's cool about the digital thread is that it's critically important for another method GE uses: Brilliant factories. To build these factories, GE depends on 4 pillars: virtual manufacturing, intelligent machines, flexible factories, and reconfigurable supply chains. Through building connections within its manufacturing operations, enabling factory floors with sensors that collect and transmit data to improve their performance and perform more flexible operations, and working with its supply chains to reconfigure operations to produce customized products, Brilliant factories are essential for GE to thrive in an interconnected and competitive global economy. (Ge)

**RAGHAV:** With supply chains fully globalized, businesses are vulnerable to geophysical and geopolitical shocks and must react quickly. Countries are in intense competition to improve their people's incomes, and productivity and efficiency are necessary for companies and governments to thrive. The implementation of Brilliant Factories will act as the green engine that supports strong global growth, and the factories' digital threads will make links within the global economy more efficient and resilient, leading to further gains in productivity and innovation. (Ge)

**ANINA:** This is why building a connected digital thread is crucial for GE, but it's not just their responsibility. The U.S. government's National Manufacturing Initiative, led by President Obama, is also focused on building the digital thread. The recently established Digital Manufacturing Innovation Institute, which GE is a key partner of, is bringing together industry, government, and academia to develop new technologies and skills necessary to make the digital thread a reality. The Institute aims to educate and provide digital tools to small and medium suppliers, enabling them to be more competitive and innovative. (Ge)

**LUCY:** So how does all this tie back to Schenectady and other local economies?

**ANINA:** Although Schenectady has had its ups and downs throughout the decades of GE scaling back operations in the area, the positive impacts that GE has had on the local economy can't go unnoticed.

**BRIAN:** I completely agree. Because GE is such a global company, when we bring in employees and partners from all over the world right here to Schenectady, it has a huge benefit on the local economy. People stay in local hotels and eat at local restaurants, which helps strengthen the community.



**RAGHAV:** I know that GE scaling back operations here in Schenectady once harmed local businesses. Do you think if GE permanently left the area, it would leave a massive hole in Schenectady's economy?

**BRIAN:** Schenectady 20-30 years ago was very different from Schenectady now. GE was all there was back then, and everything in the area centered around GE and its technology base. That's why when GE began to move operations out of the area, there was a loss of economic prosperity. However, Schenectady today is much more vibrant. Although many of the jobs and businesses in the area can be attributed to the fact that GE has brought in such a diverse, capable, and competitive workforce, the capital district's prosperity nowadays can be credited to much more than just GE.

**LUCY:** How so?

**BRIAN:** The economy in the New York Capital District, especially Schenectady, is much more resilient than the GE-dependent economy once was. If GE, a company in this complex intertwined economy, were to leave or face a challenging time, the area's economy would still be strong. Job skills developed in one business could be deployed in another, and the optionality in the community is very healthy.



## [CLOSING]

**LUCY:** It's true. Although the possibility of GE exiting Schenectady would have been catastrophic 10 to 20 years ago, current Schenectady has a real shot. Still, when looking around at other former industrial towns, it's easy to see why GE leaving makes Schenectady residents uneasy. There's a serious pattern of the companies that employed most of a town leaving, in favor of carrying out production overseas.

**RAGHAV:** Departure would result in a loss of tax revenue for the local government, which has to be made up for. This leads to cuts in essential services, such as education, public safety, and maintaining infrastructure. Large companies usually invest in local projects and initiatives, and their presence helps attract other businesses into the area; when big companies leave, all those opportunities disappear.

**ANINA:** But Schenectady has hope. CBS 6 News reports that in 2019 New York State Downtown Revitalization awarded Schenectady \$10 million. The plans for this money will create over 90 new apartments on Clinton Street, invest in the city's art scene, create mixed-use spaces, and improve infrastructure. (DeRosa) At the same time, community-led groups like The Schenectady Foundation are working to help improve Schenectady. Their project, Hamilton Hill 2, "will clean up abandoned buildings, and create 85 new housing units." (The Schenectady Foundation) General Electric's presence throughout the development of Schenectady, attracted so much to the city and built upon its existing history. Before General Electric, Schenectady already had the historical Stockade district and Union College. With GE, Schenectady gained important businesses like Proctors Theatre and Ellis Hospital and became the home of one of the first-ever television stations, WRGB. ("General History") All that General Electric has contributed to the city has grown Schenectady's historical and cultural relevance. The foundation and legacy that General Electric made in Schenectady, will be exactly what allows Schenectady to carry on if GE ever left the area for good.

**LUCY:** Schenectady is strong and resilient. Although the looming prospect of GE pulling away from Schenectady to put its focus on its campuses abroad makes many residents uneasy, even in the face of globalization, Schenectady will last.

## [OUTRO]



***Large companies usually invest in local projects and initiatives, and their presence helps attract other businesses into the area; when big companies leave, all those opportunities disappear.***

*In conclusion, GE's globalization had a significant impact on Schenectady and other local businesses. The company's decision to move production overseas and shift its focus to high-tech industries led to a decline in manufacturing jobs in the area; however, the company's presence also brought innovation, investment, and a skilled workforce to Schenectady, which helped spur economic growth and diversify the local economy.*



*Ultimately, the story of GE's globalization impact on Schenectady is a nuanced and multifaceted one, highlighting both the benefits and costs of economic globalization. By examining the experiences of these communities, we can gain a better understanding of the opportunities and challenges posed by globalization to create policies and practices that promote shared prosperity and economic growth for all.*

*Thank you for listening to this episode of the Schenectady Marketplace. Join us next time as we explore other topics related to the local economy and the businesses that drive it.*

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Left to right: Donna Scrivanich (advisor), Alex Goldfarb, Jai Khosla, Christina Ahn, Seongbeen Bae, Brianna Schulstad, and Tanvi Koduru

# Northern Highlands Regional High School

Allendale, NJ

# Making *CENTS* of Petrodollars



**MODERATOR:** Is the petrodollar running out of gas?

How does this impact our global economy? And wait, what even is a petrodollar?! Well, we're about to find out! Welcome to the Global Pun Podcast, a podcast created to engage high school students by having some "fun" with today's global issues that are difficult to understand. In today's episode, we will be following the globalization and potential deglobalization of the U.S. dollar. We have a panel of economic experts here to help us break down this complex topic. Let's step on the gas pedal and shed light on our global economy.

**MODERATOR:** Can we start by making some *CENTS* of the petrodollar?

**ECONOMIST AHN:** Petrodollars are U.S. dollars used to buy and sell oil. In recent years, they've been a hot topic due to rising global tensions.

**MODERATOR:** When did we start using the petrodollar?

**ECONOMIST KODURU:** We can trace the petrodollar's origins back to World War II when the United States held most of the world's supply of gold. The U.S.'s control over the gold supply prompted us to create the Bretton Woods System in 1944, where all countries agreed to peg their currencies at a fixed price to the dollar. However, in 1971, stagflation prompted many nations to redeem their dollars for gold, depleting gold reserves. To protect the remaining gold reserves, President Nixon removed the dollar from the gold standard (Vaidya, 2023).

**ECONOMIST AHN:** This led to a transition to a fiat money system, meaning that the prices of currencies, relative to each other and the

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**By accepting U.S. dollars for its oil trade, oil-producing countries create consistent demand for the U.S. dollar, helping maintain its position as the key global currency and the world's dominant reserve.**

dollar, changed according to supply and demand (D. Spiro, Professor, personal communication, February 22, 2023). In response to this instability, the U.S. looked to establish a way to anchor the value of the U.S. dollar and maintain its status as the dominant international currency (Amadeo, 2022).

**MODERATOR:** Seems like the United States had to *switch gears*. How did the U.S. go about doing this?

**ECONOMIST KODURU:** The U.S. found an opportunity to do so through Saudi Arabia. In 1973, the U.S. agreed to offer weaponry, military supplies, and protection to Saudi Arabia, the most powerful country in OPEC. In exchange, Saudi Arabia agreed to price and trade oil in U.S. dollars, support American foreign policy, and be open to investing their surplus oil proceeds in U.S. debt securities. With oil standardized in terms of dollars from this agreement, any country that purchased oil from Saudi Arabia would have to use dollars (What Is the Petrodollar? 2022). By 1975, all OPEC members embraced the Saudi Arabia/U.S. deal and agreed to export oil in U.S. dollars, establishing the dollar as the currency for oil payments worldwide. (Niemi, 2023).

**MODERATOR:** This makes a lot of *CENTS*. But let me *drill a bit deeper* here – how do these petrodollars benefit our economy?

**ECONOMIST BAE:** By accepting U.S. dollars for its oil trade, oil-producing countries create consistent demand for the U.S. dollar, helping maintain its position as the key global currency and the world's dominant reserve. In fact, central banks hold about 60% of their foreign exchange reserves in dollars, about roughly half of international trade is invoiced in dollars, and about half of all international loans and global debt securities are denominated in dollars. And, with the high levels of USD reserves, there are increased inflows of capital into the U.S. economy (The U.S., 2022). We benefit greatly from this as these Treasury bond purchases help to fund our debt. Moreover, the heightened demand for the dollar helps the United States issue these bonds at lower interest rates, essentially borrowing at a lower cost (Siripurapu, 2020).

**MODERATOR:** Seems *priceless* being the *premium* currency. What's in it for them?

**ECONOMIST BAE:** Many countries buy U.S. Treasury bonds as

a safe haven and to stabilize their currency. Buying Treasury bonds reduces inflationary pressure and maintains the balance of payments by preventing the extra money generated from trade from entering the domestic economy. Also, buying U.S. Treasury bonds keeps their export costs lower, which helps maintain their trade surplus. As of December 2022, \$3.66 trillion of Treasury securities were held by foreign countries (*Major Foreign*, 2023).

**MODERATOR:** Okay, so it's clear that the petrodollar is *CENTSSational*, but are there any reservations about it?

**ECONOMIST BAE:** Yes. Even though the dollar is still the key global currency, dollar reserves held by foreign countries are decreasing. With heightened geopolitical tensions and possible developments of new currencies to rival the dollar, dollar reserves are going to continue to decrease. In particular, Russia, Saudi Arabia, and China have been threatening the dollar's dominance in global markets, including the oil market.

**MODERATOR:** I read that Russia recently turned to the Chinese yuan over the USD, which is so *crude*. Why would Russia feel compelled to do so?

**ECONOMIST SCHULSTAD:** Russia has been in an intense geopolitical situation for the past decade. Their annexation of Crimea in 2014 resulted in international sanctions that banned technology for oil and gas exploration, as well as credit to Russian oil companies and banks (Welt, 2022). These sanctions were never lifted, prompting Aleksandr Novak, the Deputy Prime Minister of Russia, to warn that Russia would move away from U.S. dollar-denominated crude oil contracts if the U.S. continued to enforce sanctions (Meredith, 2021). Sanctions against Russia have persisted, in large part due to their invasion of Ukraine in February 2022, which virtually ended all trade





with Russia. While many expected the 2022 sanctions to devastate the Russian economy, as oil exports typically account for 40% of Russia's total export revenues (Palmer, 2022), Russia has quickly covered its losses in American and European markets by opening up new markets in China and India. Russian and Chinese energy giants have already agreed to switch payments for gas over to their respective currencies rather than the U.S. dollar (Xu, 2022). In addition, Russia's National Wealth Fund is increasing its yuan reserves and Russian companies are borrowing yuan (Dulaney et al., 2023).

**MODERATOR:** Okay, so Russia is clearly *pumping the brakes* on the petrodollar. How does Saudi Arabia fit into the picture?

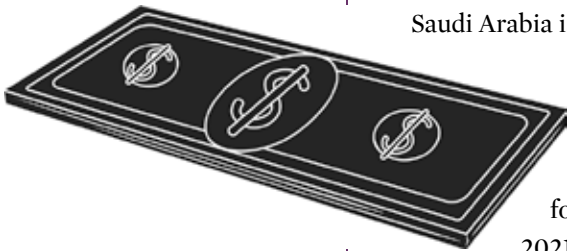
**ECONOMIST SCHULSTAD:** For decades, the United States asserted the petrodollar's dominance through its close ties with Saudi Arabia, the world's largest oil exporter. However, events throughout the past decades have strained U.S.-Saudi relations, including 9/11, nuclear negotiations with Iran (Budryk, 2022), the execution of American journalist Jamal Khashoggi, and threats of antitrust lawsuits by the U.S. against OPEC (Dahan & Yaakoubi, 2022).

**MODERATOR:** The tension sure has mounted. So let me guess, Saudi Arabia is phasing out the petrodollar?

**ECONOMIST GOLDFARB:** They are. As Saudi Arabia has become increasingly hostile towards the U.S., they have turned to China as an ally and market for oil. Saudi Arabia was China's top crude supplier in 2021 (Said & Kalim, 2022). The establishment of strong trade relations between Saudi Arabia and China pertains to more than just energy policy. In return for these energy deals, China made Saudi Arabia the largest regional recipient of Chinese contracting and investment, enabling Saudi Arabia to accomplish many of its infrastructure goals. Although Saudi Arabia hasn't yet announced plans to stop using the petrodollar, it seems increasingly likely that they will begin to trade oil in yuan.

**MODERATOR:** And I assume that China is *fueling* this movement away from the dollar?

**ECONOMIST GOLDFARB:** It certainly seems that way. China has been planning to topple the petrodollar for quite some time. In 2018,



China began to publicly worry about levels of U.S. debt and threatened to stop buying more. At the same time, they began arranging currency swap agreements with other major global powers. Additionally, they launched yuan-denominated crude oil futures in Shanghai, which challenged the petrodollar for control in the global market (Salameh, 2018). By taking advantage of its economic leverage over the United States, China began to destabilize the petrodollar. China's cooperation with both Saudi Arabia and Russia provides further indication that China wants the yuan to be the major global currency.

**ECONOMIST SCHULSTAD:** But such a move would be against China's economic interests. China and the U.S. have a symbiotic relationship. If China were to do anything to threaten its trade relations with the U.S., such as replacing the dollar with the yuan, the ramifications on China's economy would be devastating (Lee, 2020).

**MODERATOR:** So it seems like we are on a *slippery slope*. If the globalized petrodollar does end, what would the impact be?

**ECONOMIST AHN:** There are two major concerns, and perhaps some unexpected benefits for the U.S. economy. The first concern is that the dollar may be ousted as the world's main reserve currency. Currently, the U.S. can cheaply borrow from other countries, as there is high demand for dollars and dollar-backed securities. It also comes with the responsibility of the U.S. remaining in a state of account deficit to fulfill the reserve requirements of the global economy. If the U.S. were to stop deficit spending, the lack of liquid dollars would cause global economic declines.

**ECONOMIST KHOSLA:** However, if the spending continues, and the U.S. deficits continue to grow, other countries could lose faith in the dollar and the world would move away from the dollar as the reserve currency. This is known as the Triffin Dilemma (Makele, 2022). If countries start accepting other currencies for oil, reliance on dollars would decrease, and the dollar could lose its status as the reserve currency. This would be bad for the economy because the U.S. would no longer be allowed to borrow at low rates, and the burden of funding federal activities and investments would fall more heavily on U.S. citizens (*What Is the National*, n.d.).

**MODERATOR:** Sounds like that would make no *CENTS* for our economy. If the petrodollar does fail, how will the dollar be affected?



**Bringing foreign manufacturing back to the U.S. has been a big goal in the past few decades, and interestingly, the lower value of the dollar could aid in this process.**

**ECONOMIST KHOSLA:** That brings me to the second concern. As an increasing number of transactions move away from the dollar to other currencies such as the yuan and ruble, the demand for the dollar (and its value) will decrease. AND if the value does decrease, holding dollar reserves becomes less attractive for other countries, causing them to switch their reserves to a stronger currency with a higher purchasing power. This is a HUGE concern for the funding of the U.S. debt. Furthermore, the debt ceiling's restrictions pose the threat of default to the U.S. government, which has led many investors to lose confidence in U.S. Treasuries and sell them. Currently, foreign investors still hold over seven trillion dollars in U.S. Treasuries, with the top two countries Japan and China holding almost \$1.1 trillion and \$870 billion in U.S. Treasuries respectively as of December 2022. In the year 2022, Japan and China's holdings each decreased by around \$200 billion, and China now has its lowest holdings since 2010. This could be a possible start to the de-dollarization process, which would leave the dire question of who's funding the U.S. debt (Kondo & Komiya, 2023).

**MODERATOR:** That's a scary thought. And I am assuming that if the value of the dollar *tanks*, there will be a *spillover* into trade, right?

**ECONOMIST KHOSLA:** Yes...but this is where we could see some positives. With comparatively cheaper domestic currency, international demand for U.S. products will likely increase, while the demand for foreign goods will decrease. This will have a positive effect on our trade balance and encourage American manufacturing to reshore to offset costs. This was the case in 2021, when the U.S. became an exporter of petroleum and crude oil goods, averaging 5.5 million barrels per day (Hack & French, 2021). Bringing foreign manufacturing back to the U.S. has been a big goal in the past few decades, and interestingly, the lower value of the dollar could aid in this process.

**MODERATOR:** I can see the upside in that. Yet, here's the *million-dollar* question, what would the impact of these decreased petrodollars be on our domestic oil market?

**ECONOMIST KHOSLA:** As the use of petrodollars decreases, so would the utilization of foreign oil. This sounds like a Doomsday scenario where domestic gas prices would spike and the economy would suffer. However, the U.S. has built up a tremendous oil reserve of its own, and this transition to our domestic reserve is more seamless than one may think. Since 2010, the United States has roughly doubled

its crude oil production. The U.S. possesses over 44 billion barrels of oil reserves, ranking 11th in the world (Grape, 2022). Furthermore, in 2020, the U.S. generated 18.4 million barrels of oil each day while only utilizing 18.12 million barrels daily (Hack & French, 2021). And while this is positive news, there are still some concerns regarding U.S. oil prices.

**MODERATOR:** So you're saying the U.S. had the capacity to be a *well-oiled machine* all along! Then why, in 2020, did we import nearly eight million barrels of oil a day (Tillier, 2022)?

**ECONOMIST KHOSLA:** That's a good way to put it. However, due to high land and labor costs, along with hefty environmental regulations in the U.S., imported oil is often cheaper than domestically produced oil. Furthermore, without imports, the current U.S. oil reserve would only be able to support current domestic oil consumption for five years (Grape, 2022). So while the U.S. has the ability to support itself in the short term, it still needs to rely on foreign oil. If the day comes when it is cheaper to use domestic reserves rather than pay for oil in another currency, this switch could very well happen.

**MODERATOR:** Thank you so much, but it seems we are *running on empty*! You really helped us drill down and make *CENTS* of this complex issue. With that in mind, what are the key points you want to leave our young listeners with?

**ECONOMIST KODURU:** I agree this IS a complex issue, but let's review three main points. First and foremost, the dollar HAS BEEN and REMAINS the dominant world currency. Second, these large global reserve holdings allow for foreign purchases of U.S. Treasury bonds, thus funding our nation's debt. And last, the concern. The dollar's dominance has been threatened by increased global tensions with the United States including Russia, China, and Saudi Arabia. This is what we need to keep a close eye on as it could impact the dollar's value, our trade balance, and (most importantly) the funding of our nation's debt.

**MODERATOR:** Thanks so much for tuning in! The Global Pun will be back next week with another interesting global topic. But for now, we hope you all had some fun and made *CENTS* of petrodollars!



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**Left to right: Adam Kern, Archer Pil, Will Mahoney, Shaurya Grover, and Clemmie Everett (advisor)**

# Rye Country Day School

Rye, NY

# “Friendshoring” and Deglobalization in the Shadow of COVID-19 and Russia’s War in Ukraine

**WILL:** Welcome, folks, to *Ergonomic Economics*, the podcast where we sit in comfortable chairs and talk economics. I’m Will Mahoney, and it’s an absolute pleasure to have you listening with us today.

**ARCHER:** And I’m Archer Pil. Welcome, everybody.

**WILL:** Today, we’re going to talk about an economic buzzword that’s been getting thrown around a lot in the past few months, especially when it comes to international trade and supply chains: “friendshoring.”

**ARCHER:** That’s right. As we gradually emerge from the COVID-19 pandemic and in the shadow of Russia’s war on Ukraine—which has been going on for just over a year at this point—we as a world economy have been looking for ways to insulate our supply chains from shocks in the future.

**WILL:** One proposed solution to this that is especially popular among American corporations is “friendshoring,” which we’ll dive into today.

**ARCHER:** That’s right, Will. This is *Ergonomic Economics*: get comfortable.

## [MUSICAL TRANSITION]

**WILL:** On April 13th, 2022, U.S. Secretary of the Treasury Janet Yellen delivered a speech to the Atlantic Council, outlining a “way forward

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for the global economy.”<sup>1</sup> Secretary Yellen’s remarks came at a time of much global economic uncertainty: just under two months earlier, Russia commenced its invasion of Ukraine, and the world was—just as it is now—still gradually emerging from the COVID-19 pandemic.

**ARCHER:** In particular, the issues facing the global economy disrupted global trade and supply chains, making many goods either less readily available or more expensive for consumers across the globe. Secretary Yellen hoped to chart a course for the United States through these pressing global economic difficulties in her address.

***Broadly speaking, “friendshoring” refers to the “practice of relocating supply chains to countries where the risk of disruption from political chaos is low.”***

**WILL:** What is now broadly remembered from this speech, however, is one sentence towards the middle of it, where Secretary Yellen coined the term “friendshoring” in the context of international supply chains. From the American perspective, she explained: “Favoring the ‘friendshoring’ of supply chains to a large number of trusted countries, so we can continue to securely extend market access, will lower the risks to our economy, as well as to our trusted trade partners.” Including a not-so-subtle reference to Russia, the war in Ukraine, and the resulting oil and gas crisis in Europe and elsewhere, she claimed that “We cannot allow countries to use

their market position in key raw materials, technologies, or products to have the power to disrupt our economy or exercise unwanted geopolitical leverage.”

**ARCHER:** Though the speech included a large number of actions that might be taken to remedy the economic issues facing the United States and the world, the notion of “friendshoring” that Secretary Yellen raised was immediately picked up on by the press as a major issue in global trade policy.

**WILL:** Broadly speaking, “friendshoring” refers to the “practice of relocating supply chains to countries where the risk of disruption from political chaos is low.”<sup>2</sup> Essentially, by shifting manufacturing, raw

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<sup>1</sup> U.S. Department of the Treasury, “Remarks by Secretary of the Treasury Janet L. Yellen on Way Forward for the Global Economy,” news release, April 13, 2022, <https://home.treasury.gov/news/press-releases/jy0714>.

<sup>2</sup> Sarah Kessler, “What Is ‘Friendshoring’?,” New York Times, November 18, 2022, <https://www.nytimes.com/2022/11/18/business/friendshoring-jargon-business.html>.

materials sourcing, and other production steps to allies of their home countries, corporations can (attempt to) insulate their global supply chains from instability or hostility that might arise overseas.

**ARCHER:** The term is part of a related suite of international trade buzzwords that have emerged in recent years, including “onshoring,” “reshoring,” and “nearshoring.” The first two refer to corporations establishing (or returning) production to their home countries, while the latter refers to establishing steps of the global supply chain in nearby or bordering countries.<sup>3</sup> Friendshoring is distinct from these in that the relationship between the home country of the corporation and the proposed location of expansion or production is largely political; friendshoring focuses on countries that are geopolitically “allied” or “aligned” with the home country.

**WILL:** Proponents of friendshoring believe that it has the potential—particularly for the United States—to prevent or soften the blow of international crises on supply chains. By lessening the nation’s reliance on unstable nations or authoritarian regimes for natural resources and production and leaning more toward allies that are aligned politically with American interests, the argument goes, the United States can ensure that its supply chains remain secure.<sup>4</sup>

**ARCHER:** Take, for instance, the immense, immense impact that Russia’s invasion of Ukraine has had on global supply chains. This shock was both sudden and unexpected in magnitude, particularly for the oil and gas industries.<sup>5</sup> For European countries in particular, relying on Russia for their natural gas meant that cutting economic ties entirely was difficult if not impossible. Had these nations “friendshored” their sourcing of oil and gas, this supply would not have been placed in jeopardy and geopolitical ties with Russia could be cut easily.<sup>6</sup>



<sup>3</sup> Bart Coppelmanns, “Nearshoring and reshoring are reshaping global supply chains,” *Automotive World*, last modified October 28, 2022, <https://www.automotiveworld.com/articles/nearshoring-and-reshoring-are-reshaping-global-supply-chains/>.

<sup>4</sup> U.S. Department of the Treasury, “Remarks by Secretary.”

<sup>5</sup> Beth Stackpole, “Ripple effects from Russia-Ukraine war test global economies,” MIT Sloan School of Management, last modified June 28, 2022, <https://mitsloan.mit.edu/ideas-made-to-matter/ripple-effects-russia-ukraine-war-test-global-economies>.

<sup>6</sup> Vladimir Soldatkin, “Moscow’s decades-old gas ties with Europe lie in ruins,” *Reuters*, February 14, 2023, <https://www.reuters.com/business/energy/moscows-decades-old-gas-ties-with-europe-lie-in-ruins-2023-02-14/#:~:text=European%20Commission%20President%20Ursula%20von,with%20around%2040%25%20in%202021>.

**WILL:** China's zero-COVID policy has also had a long-term impact on many multinational corporations with manufacturing centered in China, pushing them to lead “friendshoring” efforts on a larger scale. As we all know all too well, the COVID-19 pandemic itself had a profound impact on the ability for corporations and nations to manufacture and supply goods to consumers at a pace and quantity previously available.<sup>7</sup> While these visible supply chain issues have broadly begun to fade, many large corporations are still grappling with the question of location when it comes to their manufacturing. Obviously, production costs are key; however, American corporations are increasingly factoring the stability or “ally” status of a foreign country into their calculations. Apple, for example, which manufactures the overwhelming majority (around 95%) of its products in China, has targeted a shift to production away from China and into India, where it hopes to produce up to 25% of its iPhones by 2025.<sup>8</sup> This move by Apple is a prime example of “friendshoring” for an American corporation, as China becomes less appealing as a location for manufacturing—at least in Apple’s eyes—and India presents an alternative as a “friend.”



**ARCHER:** Critics of friendshoring argue that the practice is fraught for many reasons, but primarily because it would likely contribute—to some extent—to the deglobalization of the world economy.<sup>9</sup> Not only does friendshoring have the potential to create smaller blocs of allied nations reliant on one another rather than a larger, globally interconnected trade network, it also might result in lower growth in the global economy in the long run.<sup>10</sup>

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<sup>7</sup> Susan Helper and Evan Soltas, “Why the Pandemic Has Disrupted Supply Chains,” The White House, last modified June 17, 2021, <https://www.whitehouse.gov/cea/written-materials/2021/06/17/why-the-pandemic-has-disrupted-supply-chains/>.

<sup>8</sup> Arjun Kharpal, “Apple wants to manufacture 25% of its iPhones in India, minister says,” CNBC, last modified January 23, 2023, <https://www.cnbc.com/2023/01/23/apple-looking-to-boost-iphone-production-in-india-to-25percent-minister.html>.

<sup>9</sup> Julia Kollewe, “Friendshoring: what is it and can it solve our supply problems?,” The Guardian, <https://www.theguardian.com/business/2022/aug/06/friendshoring-what-is-it-and-can-it-solve-our-supply-problems>.

<sup>10</sup> Raghuram Rajan, “Just Say No to ‘Friend-Shoring,’” Project Syndicate, last modified June 3, 2022, <https://www.project-syndicate.org/commentary/friend-shoring-higher-costs-and-more-con%EF%AC%82ict-without-resilience-by-raghuram-rajan-2022-06>.



**WILL:** Soon after Secretary Yellen’s speech, in June of 2022, Raghuram Rajan, a professor at the University of Chicago and the former President of the Reserve Bank of India, published an opinion piece in which he aired some of these concerns about friendshoring. “The benefits of a global supply chain stem precisely from the fact that it involves countries with very different income levels, allowing each to bring its comparative advantage to the production process,” he wrote. “Friendshoring would tend to eliminate this dynamic.”<sup>11</sup> He went on to highlight that friendshoring had the potential to both slow down economic growth overall and particularly disadvantage developing economies, many of which rely on pieces (particularly manufacturing) of the global supply chain to sustain themselves.

**ARCHER:** Friendshoring also raises the thorny geopolitical question of how exactly to define a “friend” for the purpose of a supply chain. Does this “friend” need to be an intimate ally? A neutral country? What if the “friendship” falls apart, as international alliances so often do? The United States itself has had quite a few rocky recent relationships with many nations now considered “partners” or “allies,” at least in the economic sense. Take, for example, Saudi Arabia. In the Biden Administration alone, Saudi Arabia seems to have gone from a “pariah” to an ally and back again amidst recent discussions over oil prices.<sup>12,13</sup> Even consider the United Kingdom and the European Union: before 2016, the United Kingdom might have seemed a natural “friendshoring” companion for many European economies. Now, however, that economic relationship is (obviously) not nearly as close.<sup>14</sup>

## **[MUSICAL TRANSITION]**

**WILL:** So, that’s “friendshoring” in brief. Given that it’s a fairly new concept on the global economic stage, I think it’s worth reflecting a little on what exactly all this might mean for our future and our ever-evolving present.

***Friendshoring also raises the thorny geopolitical question of how exactly to define a “friend” for the purpose of a supply chain.***

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<sup>11</sup> Rajan, “Just Say No to ‘Friend-Shoring,’” Project Syndicate.

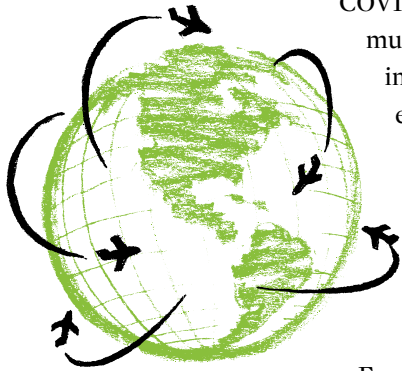
<sup>12</sup> Aya Batrawy, “Oil, human rights, security: Here’s what’s in store for U.S.-Gulf relations in 2023,” NPR, last modified January 12, 2023, <https://www.npr.org/2023/01/12/1147818054/saudi-ara-bia-gulf-nations-us-relations>.

<sup>13</sup> Kessler, “What Is ‘Friendshoring?’”

<sup>14</sup> Jan David Bakker et al., POST-BREXIT IMPORTS, SUPPLY CHAINS, AND THE EFFECT ON CONSUMER PRICES, April 25, 2022, [https://ukandeu.ac.uk/wp-content/uploads/2022/04/UKICE-Supply-Chains-Report\\_Final.pdf](https://ukandeu.ac.uk/wp-content/uploads/2022/04/UKICE-Supply-Chains-Report_Final.pdf).

**ARCHER:** Definitely. We've done our best to weigh the arguments for and against friendshoring in the main section of this podcast, but corporations—and to a lesser extent governments—are the ones that will ultimately decide whether friendshoring is worth the potentially great cost in the long run.

**WILL:** That's right. Given that we are living in a time where the COVID-19 pandemic and Russia's war in Ukraine are very much a part of our reality or recent memory, it's especially important to consider how the larger shadow of these events might impact corporations' decision-making when it comes to friendshoring.



**ARCHER:** Friendshoring might seem to be a more attractive option for a corporation that suffered heavily from production shutdowns resulting from China's zero-COVID policy or Russia's control over European gas and oil than one that was largely insulated from these sudden supply shocks.

#### **[MUSICAL TRANSITION]**

**WILL:** As always, dear listeners, thank you for joining us. We appreciate your support and attention as we do our best to present to you economic issues that matter.

**ARCHER:** This has been *Ergonomic Economics*: stay comfortable.



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Left to right: Catherine Vasnetsov, Marisa Rojas (Advisor) and Victor Vasnetsov

# The TASIS School in Dorado

Dorado, Puerto Rico

# *Lucid Economics Podcast:* Dimensions of Globalization

**HOST:** Hello and welcome to *Lucid Economics Podcast*, where we make sense of the complex world. Our topic today is globalization – what is it, and where is it going?

A gardener might describe globalization as not a single flower, but as a big bouquet of assorted flowers. To help us in sorting this complex bouquet, we assembled a panel of three leading economists. Please welcome...

From Hong Kong: Catherine, an expert on the Asia region and global foreign trade, From Brussels: Victor, an expert on Europe and Direct Foreign Capital Investments, And from San Juan, Puerto Rico: Jassiel, an expert on the Americas region and international human migration. Welcome to all!

**HOST:** Catherine, before we deal with changing trends in globalization, let's start with the definition: What is globalization?

**CATHERINE:** Globalization is usually defined as the growing interdependence of the world's economies, cultures, and populations (PIIE 1). It has at least four measurable dimensions: Trade, Capital, Information and People (Altman *HBR* 2-9).

**Trade flow:** international trade of goods and services,

**Capital flow:** cross-border capital investment,

**Information flow:** measured by telephone calls and internet traffic,

**People movement:** tourism and migration.

Some economists argue about a 5th or even 6th dimension of globalization – globalization of ideas or culture. However, both the value and number of ideas are impossible to measure objectively, as ideas are ultimately enabling all four measurable dimensions.

**HOST:** Thanks, Catherine. Let's stay in the four-dimensional globalization, it seems already complicated enough. Victor, what drives globalization?

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**VICTOR:** First of all, globalization is not a new trend. It was around for thousands of years, although its pace and scale increased last century due to lower cost of trade and easier movement of people (Sachs 24-39). Specialization has been a powerful driver of human progress for centuries, as it enables greater efficiency and lower production costs (Baldwin 63-68). German cars, Boeing airplanes and China-made consumer goods are just a few examples of large specialized trade, which creates value both for producers and consumers.

**HOST:** How far should specialization advance? Should most products be made by just a few highly specialized companies and countries, or should production and consumption be more balanced and much more broadly distributed around the globe?

**VICTOR:** Well, the answers would depend on the position of people you are asking.

Top exporters naturally want to export more of their products to a wider range of foreign customers. This will increase their sales, cross-border trade volume, and hence increase globalization.

Many developing countries, notably China, set a consistent policy of transplanting modern Western technology, instead of importing finished Western goods. China encouraged creating joint ventures with General Motors and Volkswagen, to produce and sell branded cars locally in China. Obviously, this transplanting reduced the value of international trade.

Does this decline in car imports into China imply a negative effect for globalization in that area? Yes, according to economic statistics. But is this really bad for GM, for China as a country, or for Chinese consumers? Well, it's positive for GM at least near-term: higher profits due to cheaper labor and faster sales growth of GM cars in China. Technology transplanting is very positive for China both near and long-term, as a local car assembly plant becomes a powerful magnet for developing many other local Chinese suppliers around it. It is positive for Chinese consumers who are getting high quality GM cars at lower prices. It might be negative for some GM parts suppliers in the US, who would lose sales to local Chinese parts suppliers. This simple example shows that we need to be careful to avoid oversimplifying trends: that "more globalization is good, while less globalization is bad."

**HOST:** Jassiel, how do we measure globalization? It must be very complex, given its truly global scale and so many moving parts?

**JASSIEL:** Indeed, this is a large effort, but certainly globalization is measurable.

A global shipping company DHL and NYU Stern School of Business developed the DHL Global Connectedness Index, which measures all dimensions in cross-border flows in trade, capital investment, information and people (Altman *DHL* 16).

Before we attempt interpreting the latest trends, remember that most of things in life and economics are cyclical, and various cycles have different duration and predictability. For example, the rotation of the Earth around the Sun is an exactly predictable cycle each year. In contrast, economic and financial cycles are much less consistent and almost impossible to predict, even in the short-term.

Globalization includes many of those sub-cycles: some are correlated with each other and with GDP, others are not. Some are short cycles (lasting a few quarters), while other cycles run for years and even decades. Hence, it is harder to find meaningful trends in y-o-y changes in globalization and its different dimensions. Short-term data volatility does generate many media headlines about growth, a pause, or even a reverse in globalization. It is better to look at 10 rolling years periods, excluding obvious periodic disruptions, such as the Global Financial Crisis in 2008 or COVID in 2020 (Elgin 1-3).

**HOST:** Catherine, let's discuss each dimension, starting with trade.

**CATHERINE:** Cross-border trade of goods and services shows a mixed picture. Both global production and trade of goods continue to grow in absolute value terms. However, when trade of goods is measured as percentage of GDP, this ratio has been steadily declining from 28.1% to 22.5% between 2007 and 2017 (Mayer 3). This is because many countries are getting incrementally more self-sufficient in goods production, with higher regional concentration within Asia and Europe, for two reasons: first, faster growth of local wages in developing regions and continuing automation in manufacturing reduces wage difference between developed and developing countries. Secondly, with growth of middle class in developing countries more goods are consumed locally or regionally and a smaller percentage of output is exported.

Global trade intensity declined from 25.2% to 21.1% of global GDP in the past





decade (Altman *DHL*, 40), and this could be explained in part by virtue of developing countries reaching next stage of their economic development.

Over the past decades, globalization has been generally positive for increasing prosperity: a 10% increase in trade raises a country's per capita income by more than 5% (Feyrer 5). However, some countries or specific categories of populations could be negatively impacted by globalization – as seen by loss of US manufacturing jobs, initially to Mexico and then to China. This trend is just getting partially reversed.

Trade in services is growing on both absolute and ratio terms – from 6.1% to 7.2% of global GDP in 2011-2019 (Altman *DHL* 40). This was notable in finance and software – which are easier, cheaper, and faster to sell, compared to lengthy shipping of physical goods across oceans.

**HOST:** What about trade barriers?

**CATHERINE:** Since the 1960s, the world enjoyed a long and mostly steady trend of trade liberalization, as seen in the reduction of average import tariffs from 16% to 5% of import price (WTO *Tariffs* 152-158). Lower trade barriers, along with the reduced cost and complexity of importing, allowed global trade to expand. The U.S.-China trade is the largest among any bilateral country links within global trade. In 2018-2019, the U.S. raised tariffs on Chinese imports by \$73 Billion, which caused a 25% reduction in trade in affected goods (WTO *Tariff* 74). Trade wars happen periodically between the U.S. and its partners, usually with small and temporary impacts. You could think of these small-scale trade wars as bumps on the road of globalization.

Partially in response to uncertainty in tariffs and periodic trade tensions, production value chains are becoming less global and more regional. Within the European Union (EU), there are no trade tariffs between EU member states, and there is high certainty about this zero-tariff continuing in the future. Not surprisingly, two thirds of EU cross-border trade is among EU members and only one third externally (WTO *Trade* 27). China and developing Asia could account for more than half of global goods consumption by 2030 (Lund *McKinsey* 3).

**HOST:** Victor, could you update us on your specialty, Foreign Direct Investments (FDI)?

**VICTOR:** Cross-border capital investments are driven by differential in investment opportunities across various real economy segments and





financial markets. Global FDI peaked in 2007, just ahead of the 2008 Global Financial Crisis, afterwards it recovered to stability over four years, but it started another period of consistent decline from 2013 to now (OECD *FDI* 17). Real economy investments include construction of new factories, transportation, and tourism infrastructure. Real economy investments have very long cycles: a few years of planning and construction, then several decades of operations. Hence, investments in real economy could be called “slow money” due to a very long investment horizon.

In contrast, the second part of capital flow is driven by buying already existing assets and trading in securities (buying stocks and bonds of foreign companies). This second part could be called “fast money,” as this capital is much faster moving in and out, and highly influenced by financial, economic and political drivers. “Fast money” flows have also been trending generally down, from 9.3% to 7.1% of global GDP in the past decade (OECD *FDI* 31).

**HOST:** Why is FDI declining? And is a declining FDI good or bad?

**VICTOR:** Well, lower than expected average returns on foreign investment were the main reason for the recent FDI decline. Capital is always looking for the best risk-adjusted returns, and such returns, particularly in developing countries, have been lower than in one’s home country, while perceived (and real) investment risks were higher abroad. Also, sudden and major interruptions in global trade by COVID changed the perception of risk and prompted some industries to shorten and diversify their supply chain (Davis 3-7).

There is no universal view that “larger FDI is good and smaller FDI is bad.” Smaller FDI means the changing availability of capital and shifts in competitive landscape, which could be good or bad to a given industry or country. Capital always looks for best return opportunities, just like water always flows from higher to lower altitudes, by natural force of gravity.

**HOST:** Jassiel, what are the latest trends in flow of information and migration of people?

**JASSIEL:** Both flows are growing, in contrast to the decline in two prior dimensions discussed by Catherine and Victor. Information flow has been steadily growing at 4% per year, almost doubling since 2001, while the Internet component was the fastest, growing at >10% per year (Altman *DHL* 39-40).



People migration has three components: short-term tourism, longer-term legal migration, and illegal migration (OECD *Migration* 5). Growth in tourism globally or regionally is driven by discretionary income and the growth of upper middle class in developing countries, notably China and India. More affordable airfare and reduced travel visa barriers also helped tourism to grow by 2.2% on average in the past decade, pre-COVID (Altman *DHL* 54).

During the first year of COVID, global tourism plunged by 73% to the level of 1990, as travel restrictions were introduced by most countries (Mayer 8), limiting travel only to essential business and country citizens traveling for urgent family reasons. This was the biggest synchronized global travel collapse in post-World War II history (Mayer 10).

Comparing the first halves of 2021 and 2019, international arrivals were down 95% in Asia, 82% in the Middle East, 77% in Africa and Europe, and 68% in the Americas (UNWTO 6). Travel started a strong sequential recovery in late 2021 to about 37% of the 2019 average, and recovery continued up to 75% of the 2019 average by late 2022 (Altman *DHL* 55). I hope that with China re-opening, 2023 should see further improvement to perhaps 87%, so that 2024 could be the first “normal post-COVID year.” Still, the COVID pandemic “stole” at least four years of global growth in tourism.

**HOST:** Hopefully, this disruption is all behind us, along with COVID itself. What about immigration?

**JASSIEL:** Legal immigration is controlled by destination countries, and it could be changed by immigration laws. The U.S. and Europe are by far the most popular destinations, and both have become more restrictive in general, and particularly during the last two years of COVID. Legal immigration (by airplanes, trains and boats) also declined by 27% in 2020 due to much reduced overall international travel (Altman *DHL* 55-56).

Illegal immigration is driven by search for safety from man-made or natural disruptions (wars, drought and famine) and more generally, by search for a better life in richer countries. Illegal immigration (typically by land) had its own waves. In 2022, 2.4 million migrants (mostly from Central America) attempted illegal crossing of the U.S.-Mexico border compared to 0.8 million of crossings in 2019 (Chishti 1).

Another massive legal, but likely temporary, migration was triggered by the Russian invasion of Ukraine, resulting in 4.6 million Ukrainian refugees settling temporarily in Europe (OECD *Migration*). Presumably,

most of them will return home after the eventual end of the war.

**HOST:** Catherine, there has been a lot of media speculation that globalization stopped, and even that a de-globalization is happening. Is this true?

**CATHERINE:** Globalization is certainly not over. As a living creature, globalization is evolving and morphing into different ways, shifting from goods to services, and also shifting from long-distance trade between continents to inter-regional trade (King 45-52).

Perhaps, some confusion about the direction of globalization is caused by its complexity and one's choice of timeframes for drawing conclusions (Economist 35-41). This also could be caused by difficulty of measuring its values in any given month. Globalization is best measured over several years, perhaps a decade, hence the answer depends on one's timeframe (Mosley 14-18). Globalization contains several distinctly different trends, and its speed or even direction of globalization is different in various regions and countries (James 795-798).

**HOST:** Jassiel, could you please summarize globalization trends in 30 seconds for our listeners?

**JASSIEL:** Globalization is not new, but is still evolving, although at a variable pace. Trade in goods is getting smaller, while trade in services is growing, along with information flow.

Tourism is growing (excluding COVID impact). Migration of people is generally growing, but it is volatile, depending on government policies and regional crises. Just like people, globalization was not immune from COVID. It got sick for some time in 2020-21, but it is recovering quite fast.

**HOST:** Thank you all for insightful views on various dimensions of globalization. Our audience would appreciate your next update on globalization by year-end.

Meanwhile, our next *Lucid Economics Podcast* will be focused on the path of the U.S. economy "landing" in 2023: soft, hard or none at all?

Until next week – goodbye.

***Globalization is certainly not over. As a living creature, globalization is evolving and morphing into different ways, shifting from goods to services, and also shifting from long-distance trade between continents to inter-regional trade (King 45-52).***

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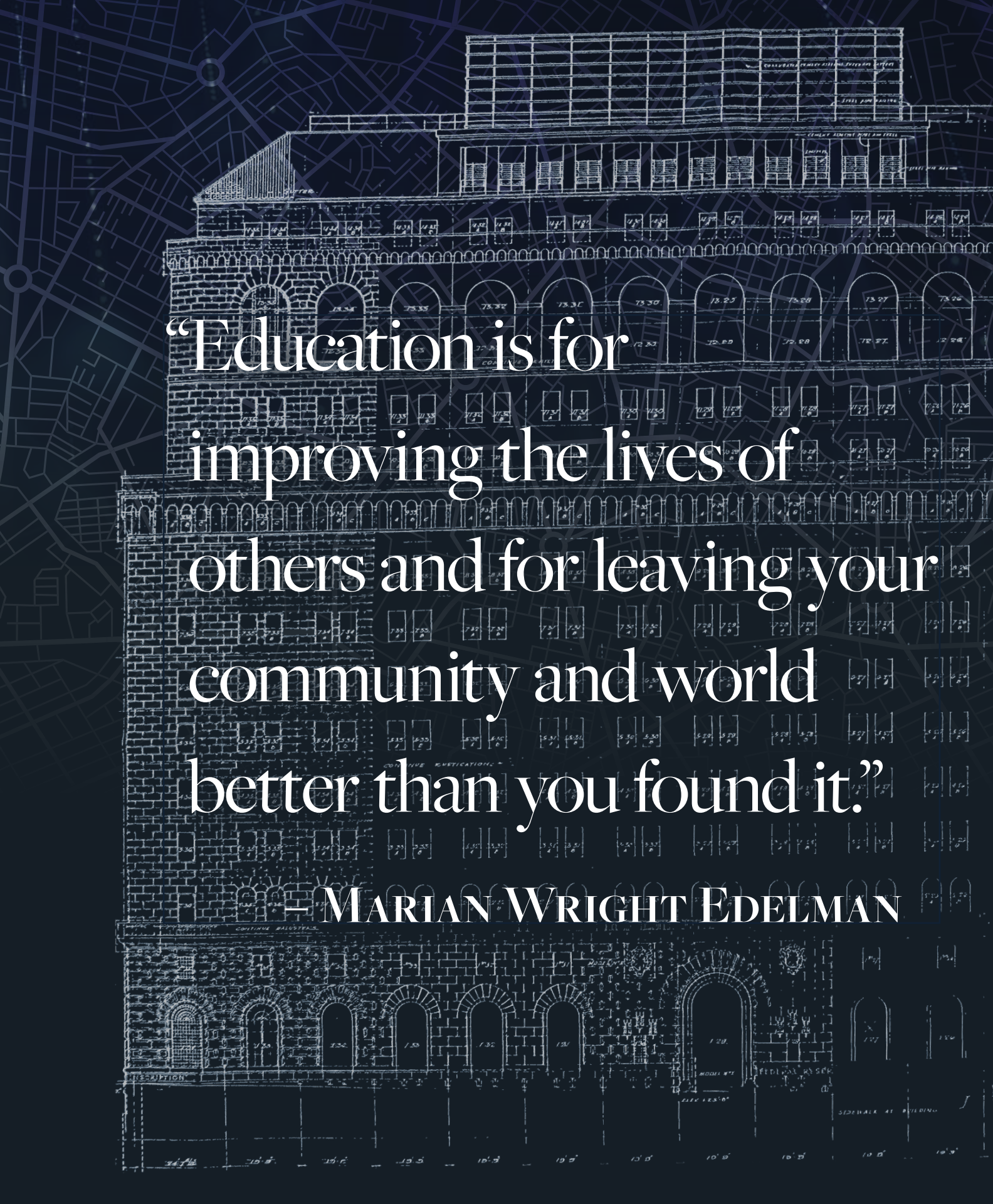
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community and world  
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