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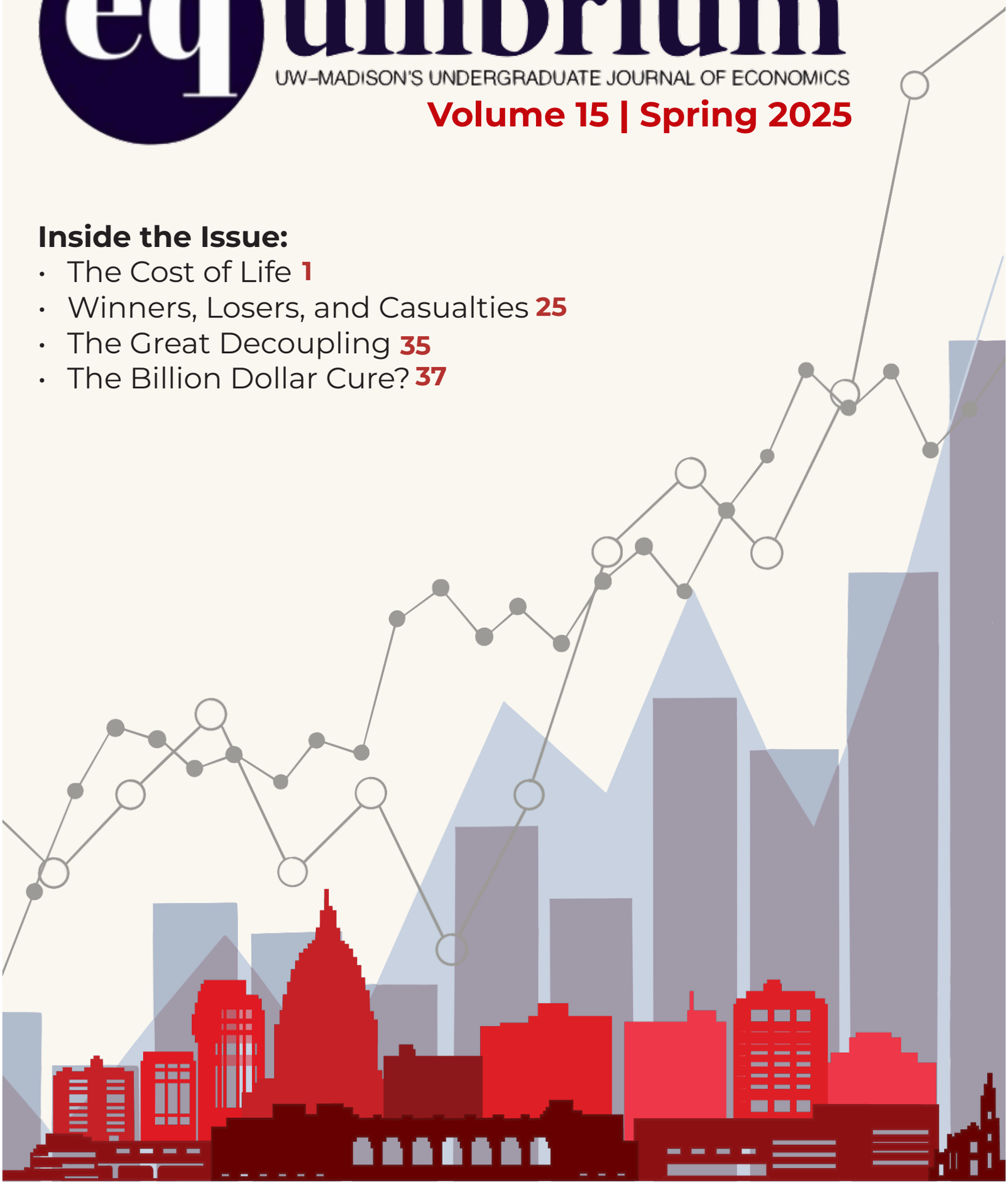

Letter from the Editors

Dear Readers,

We are thrilled to present the fifteenth edition of Equilibrium: The Undergraduate Journal of Economics. This volume would not have been possible without the dedication of our writers, editorial board, and the broader community within the University of Wisconsin–Madison Department of Economics.

Our journal takes pride in showcasing a diverse range of economic thought, and this edition is a testament to that mission. Among the topics explored are the effects of J-1 visas on local communities, the environmental implications of carbon offset trading, and the growing prevalence of GLP-1 drugs. As a student-run publication, we hold ourselves to the responsibility of delivering clear, relevant analysis that speaks directly to the issues facing our peers. That mission grounds us each year as we shape a new volume, and we hope this edition resonates with you—sparking curiosity about the ways economics intersects with your everyday life.

Economics is uniquely positioned to bridge seemingly disjoint areas of academic inquiry, and it is vital to foster that spirit of exploration at the undergraduate level. I'm especially proud to note that this volume was produced by the youngest cohort of contributors in our journal's history—a promising sign for the future of Equilibrium.

We owe a great debt of gratitude to the University of Wisconsin-Madison Department of Economics. A special thanks goes out to Tara Ninmann, our advisor, for her unwavering support and dedication over this past year. We thank Amy Schultz for uniting our journal with the Digital Studies program, and our graphic designers Kayla Wallner and Madison Burrow for putting together the beautiful journal you are reading now.

Finally, we thank you. Without our readers, we would not have this amazing outlet to express our passion for the field of economics and explore the issues that captivate us. Thank you, and we hope you enjoy the fifteenth edition of Equilibrium: The Undergraduate Journal of Economics.

Sincerely,
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About Equilibrium

Founded in 2010 and first published in 2011, Equilibrium is the rigorous Undergraduate Journal of Economics at the University of Wisconsin–Madison. Our mission is to showcase the excellent research undertaken by undergraduates in the economics department and to convey economic literature to wider audiences. EQ Journal publishes articles on an annual basis in Spring. Each Equilibrium volume includes articles written and edited by undergraduates about analysis-based articles, research reviews, opinion pieces on trending topics in economics, and faculty interviews with department members.

If you wish to join other alumni, staff, parents and friends in supporting the work of the UW-Madison Department of Economics, make a gift at:
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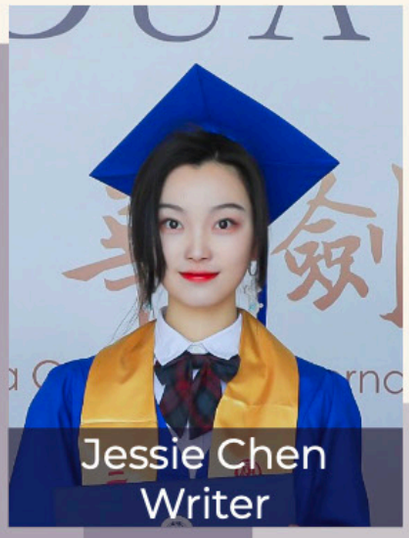

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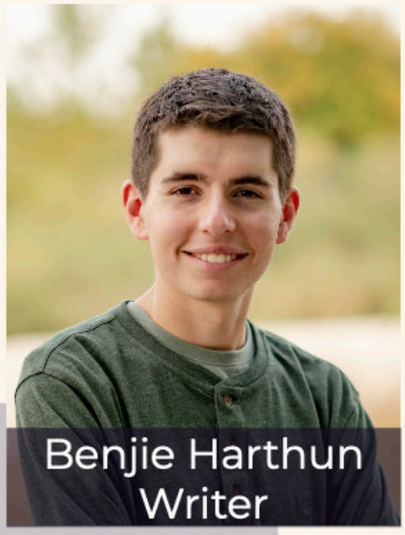

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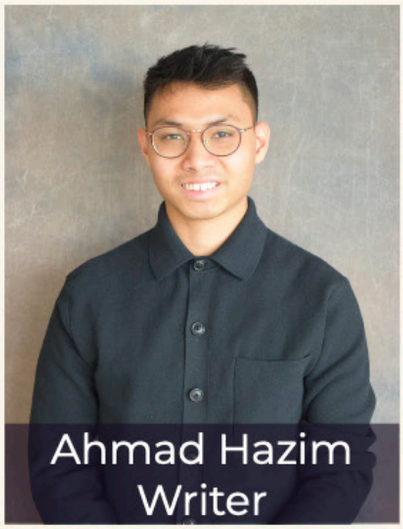

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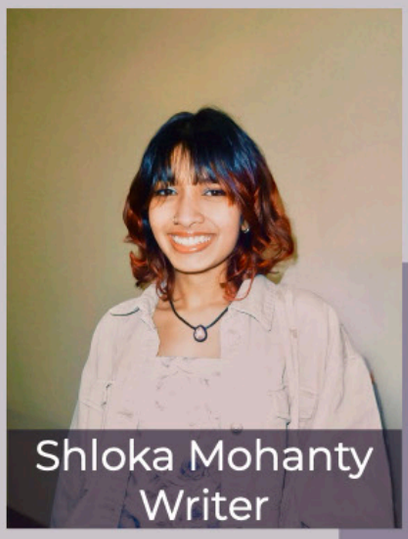

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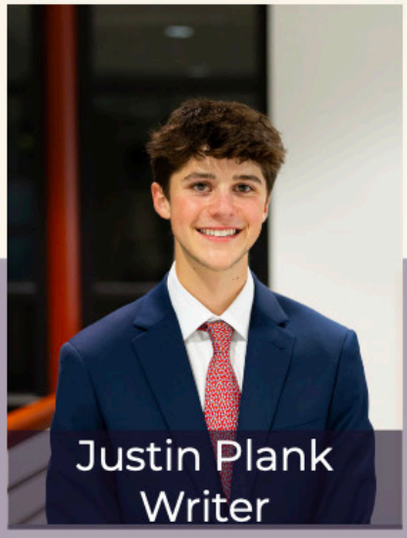

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Table of

Content

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The Cost of Life: The Economic Impacts of the Death Penalty

By: Benjie Harthun

Is death cruel and unusual?

The constitutionality of the death penalty has been a highly contentious issue in the American legal system for most of the country's history. The idea of death as punishment for a crime has existed for multiple millennia. However, politicians and the general public still debate over its morality and legality today in the United States. Legal debates surrounding capital punishment typically concern whether it violates the 8th Amendment in the Bill of Rights, which prohibits cruel and unusual punishment. And while legal and moral debates about the death penalty are plentiful, the many economic consequences of capital punishment often go unnoticed. Many Americans may never directly face the ethical and political consequences of the death penalty, but its indirect economic implications affect large portions of the population. Throughout the history of the United States, the death penalty traditionally has been an issue left to the discretion of each state. Some states moved against the death penalty early on; Wisconsin became the first state to fully abolish capital punishment for all crimes when it became a state in 1848, and other states soon followed suit. The issue rose and fell in popularity throughout the rest of the 19th and most of the 20th century until 1972 when it faced its first major federal hurdle. That year, the Supreme Court ruled in Furman v. Georgia that the statutes for imposing the death penalty were too arbitrary and therefore cruel and unusual. This decision effectively suspended the death penalty in the 40 states that still allowed it, but this wouldn't last long. In 1976, in Gregg v. Georgia, the Supreme Court reversed itself, holding that the death penalty was constitutional and allowing new death penalty statutes in several states. Since then, several states resumed the use of the death penalty, and executions have occurred every year since 1980. Among states that do use the death penalty, implementation varies; each state has control over the logistical details of executions and, most importantly, the method of execution. The methods used to execute a condemned person have evolved drastically over time (Death Penalty Information Center 2019). Each method varies widely in cost and perceived morality, but every method comes with issues that can result in the prisoner not being executed. For the 18th century and most of the 19th century, hanging was the most popular method of execution. This method was very inexpensive, only requiring rope and a platform, but had many complications. As is the case with all methods of execution, death is supposed to be instantaneous. However, even the slightest issues with the length of the rope or the height of the platform could result in a slow, excruciatingly painful death. Death by hanging was mostly phased out by the early 1900s, but the last hanging occurred in Delaware in 1996. Execution by firing squad has seen sporadic usage in U.S. history and is still legal in four states if lethal injection cannot be carried out. While relatively inexpensive, even a slight miss by one of the shooters can cause the prisoner to painfully bleed to death. The electric chair was first built in the late 1800s and had replaced hanging as the primary method of execution across the country by the early 1900s. It is still retained as an execution method in some states but is no longer the only method.

While designed to be more humane, the electric chair still has a well-documented track record of failure when its jolts of electricity fail to kill a prisoner. Again, in an effort to find a more humane way to kill someone, the gas chamber was introduced in 1924 and was last used in 1999. In this method, pellets are dropped triggering a chemical reaction that releases cyanide gas, cutting off oxygen to the prisoner's brain. Lethal injection was first used in 1982 and has become the primary method of execution for all states that still permit the death penalty. A combination of three drugs is used to paralyze the prisoner's muscles and stop their heart while strapped to a gurney. Failures in correctly administering the drugs can lead to excruciating pain and drawn-out executions. Another alternative that may become more widely used in the future is execution by nitrogen gas, introduced in Oklahoma in 2015 and first used in an execution in Alabama in 2024. This method is similar to the gas chamber but relies on the prisoner suffocating by forcing them to breathe pure nitrogen. The execution in Alabama remains the lone usage of nitrogen gas, so it's still unknown how much of a role it could play in the future.

Despite all of the costs and risk of failure associated with each method of execution, it would still seem as though the death penalty is less expensive than other long-term forms of punishment like life in prison. Surprisingly, this is not true at all; it has been proven many times that the death penalty is substantially more expensive than judicial systems that do not use it. Studies vary in their specific numbers since it is difficult to assign an exact dollar amount to processes as complex as the death penalty or life in prison, but the conclusions are the same. The cost of each death penalty trial and execution typically ranges from $1.5 to 3 million while the cost of imprisoning someone for life ranges from $600000 to $1.1 million (Spangenberg & Walsh 1989). How can this be if it runs so counterintuitively to common sense? It may seem simple to point to the cost of the actual execution, which can involve setting up the correct facilities, training employees to carry out the execution, and obtaining the necessary supplies. However, this is not the main culprit, as the marginal cost of carrying out an execution is quite low if a state is already fully equipped to carry one out. The overwhelming factor behind the higher cost of the death penalty is the associated legal costs. At virtually every stage of the judicial process, a capital punishment case involves greater legal expenses than a case without capital punishment (Miron 2023). The 6th Amendment requires the state to supply an attorney (or multiple in most cases) to those who cannot afford one, which increases the cost to the government.

The more complex nature of death penalty trials means that more time and resources are expended on things like jury selection, forensic evidence, psychiatric evaluations, and other expert witnesses, driving up costs even further. Another major legal cost of the death penalty is the appeals process. Cases involving the death penalty on average involve many more appeals than other long-term sentence cases. The various appeals to both state and federal courts often take years or even decades, which again requires valuable time and resources. Many death sentences are commuted to life in prison or overturned on appeal; of the 8,466 death sentences handed down from 1973 to 2013, 3619 were removed from death row after being either commuted or overturned (Baumgartner and Dietrich 2015). Despite the result no longer being the death penalty, the costs were still incurred. The marginal costs associated with trials and the appeals process in capital punishment cases remain high no matter how many of them a state chooses to pursue. Every death penalty case comes with a high marginal cost due to legal costs, which is the driving force behind the high economic cost of the death penalty. The higher cost of the death penalty forces the government to incur additional costs that it would not have if the prisoner was sentenced to something like life in prison. To offset these costs and keep government spending as it was previously, the government has two primary options: first, they can divest money from other expenditures.
However, this forces the government to cut money from critical areas like education, public safety, or anything else funded by the state. It is highly undesirable to cut funding from necessary areas to pay for something completely avoidable. The alternative is to just raise taxes and pass the death penalty's financial burden onto the taxpayers. Raising taxes solely to compensate for increased spending because of the death penalty reduces private spending in the economy and can hurt consumer sentiment. Another facet of the prison system that the death penalty interferes with is the prison labor system. Most prisons provide prisoners with the opportunity to work for a small wage, usually to put towards their commissary accounts or send to people on the outside. While this system is controversial and has faced accusations of promoting slave labor, it has some economic benefits. Prisoners can obtain a wage they would not otherwise have access to, and the government gains access to labor and output it would otherwise not have access to. Most death rows, however, prohibit prisoners' access to prison labor programs, which cuts off this income and output. In addition, prisoners on death row are also often denied access to educational programs that can improve their knowledge and increase labor productivity.

Prison is necessary in society, yet inherently inefficient. Governments are forced to allocate resources into constructing, operating, and maintaining prisoners when these resources could have been spent elsewhere. The high marginal costs of the prison system include both the direct costs of housing prisoners and the drop in productivity in individuals while incarcerated. The perceived marginal benefit of prison is that it acts as a deterrent against future crime; imprisoning those who commit crimes will help to prevent future crime. However, there is no strong evidence to suggest that prison actually works to prevent future crime (Nagin 2013). A more effective deterrent would be an increased sense of certainty that one would be caught if one did commit a crime. While punishing crime is necessary to preserve order in society, prison effectively removes millions from the labor force and removes the output they could have generated. And while systems like the aforementioned prison labor system can somewhat make up for this, it is far from compensating for the entire impact. The output previously provided by those now incarcerated is no longer available, so GDP decreases as private spending and investment fall. Not to mention, an estimated 5% of the prisoners are innocent, which is an even greater travesty. The death penalty only exacerbates all of these problems. It causes an unnecessarily high financial burden that is either passed on to taxpayers or taken away from vital resources and reduces output even further by preventing death row prisoners from working or getting access to an education while incarcerated. Even for those who have benefitted from the hundreds of death penalty exonerations (Death Penalty Information Center 2022), the extremely long and slow nature of death row appeals means that once a death row inmate is rightfully exonerated, they have often been languishing in prison for decades. Decades that could have been spent free and would have almost certainly provided a more positive economic impact, whether that be working, getting an education, or just boosting private spending. Even in a system without the death penalty, those who are wrongfully convicted and later exonerated could have marginally contributed during their time in prison by working or getting an education. Wrongful convictions would unfortunately still occur if the harshest sentence was life without parole, but some of the lost productivity would be able to be recouped. The death penalty only magnifies all of the economic flaws of imprisonment, and while prison may be necessary to maintain balance and peace in society, the death penalty is not. Supporters of the death penalty argue that is an economically beneficial system, as the marginal benefits outweigh the marginal costs. Similar to prison as a whole, the main proposed benefit of the death penalty is that it will deter future crimes.

The only crimes currently capable of warranting the death penalty are murder and crimes against the state like treason or espionage, a precedent set in place by Kennedy v. Louisiana in 2008. No one is currently on death row for crimes against the state, so the only possible crime the death penalty could deter is murder. While it seems logical that one might be less inclined to commit a murder in the face of such harsh punishment as death, there is no statistical evidence to suggest that the death penalty has any effect on deterring murder. Isolating the cause behind a murder is extremely difficult, and it's nearly impossible to look at a murder and say whether it would or would not happen based on the status of the death penalty in the state it was committed. Beyond the impact of confounding variables, there is no broad evidence suggesting the death penalty can deter murders. The national murder rate did not decrease following the reinstatement of the death penalty in 1976, and the murder rates in states with the death penalty are actually higher than those without the death penalty (Death Penalty Information Center 2023). The so-called "benefit" of the death penalty, deterring future crime, doesn't exist; no conclusion can be drawn on whether the death penalty affects murder rates. Incurring the high marginal costs of the death penalty for a marginal benefit with no statistical basis is not an economically sound decision.

The death penalty is one of America's most complex and controversial judicial issues and will likely remain so for a long time. Thousands of hours of political and legal research have been put forth regarding capital punishment, and arguments rage on over its constitutionality and morality. While plenty of arguments have been made on why capital punishment is wrong, like the astonishing number of death row exonerations, the ethical contradiction that it is fine to kill someone even though it was wrong of them to kill, or the fact that virtually every other developed country prohibits capital punishment; the economic impacts and aforementioned inefficiency of the death penalty are not brought up as frequently. Its high marginal cost and reduction of labor and output make it a much larger hindrance to the economy than other forms of long-term sentencing. The question remains legally whether death is cruel and unusual, but economically, the answer is clear.

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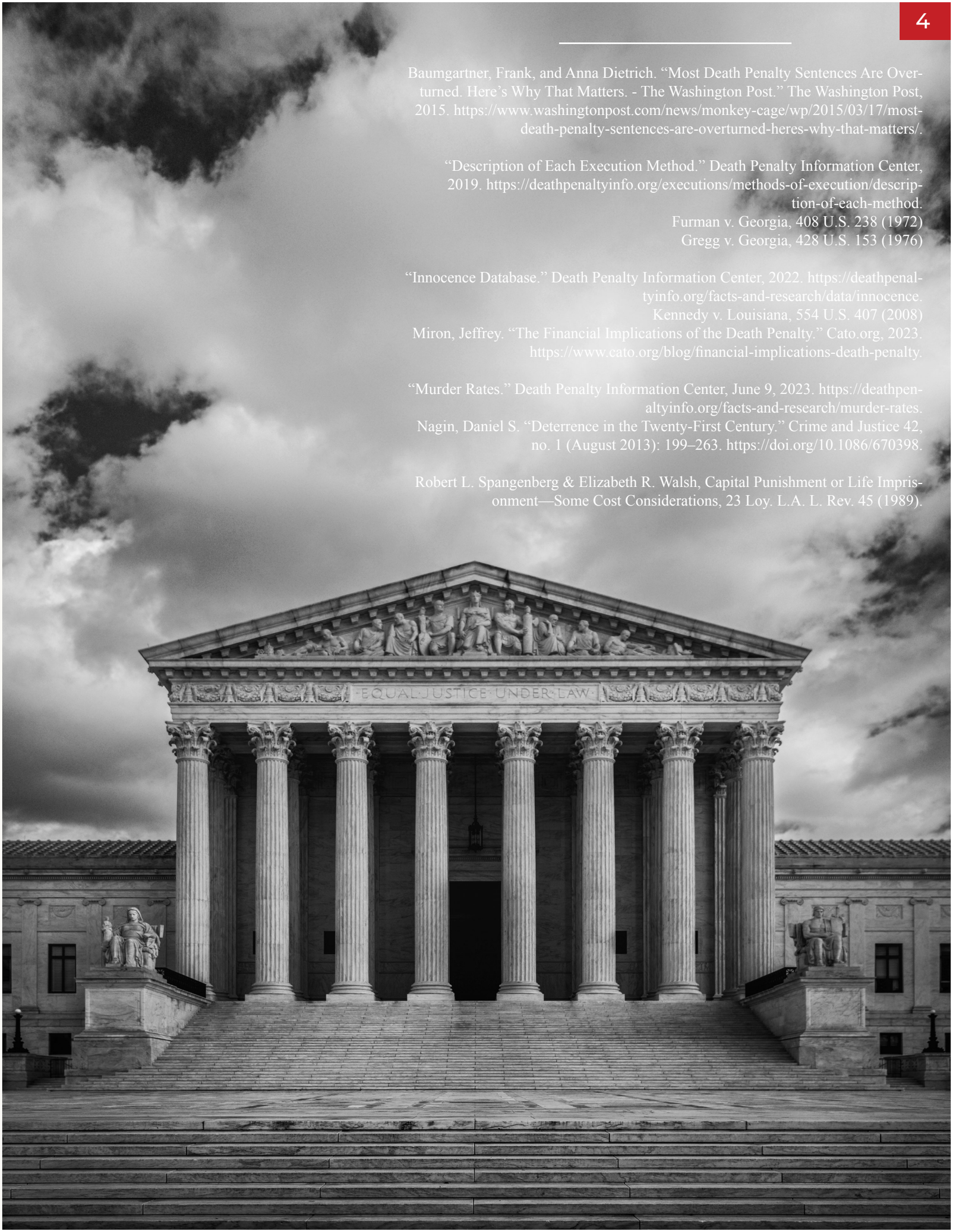

The Future of Industrial Policy: A Greener Way

By: Ahmad Hazim bin Khairul

Is a Small Country Scalable?

The world economy is approximately $106.17 trillion in size, with ASEAN (Southeastern Asian Nations) contributing roughly $3.8 trillion, which is only 3.6% of world GDP. In comparison, China alone accounts for almost 18% of world GDP, while the U.S. is responsible for approximately 25%. As a Malaysian, one cannot help but wonder: Can our resource-endowed country—stuck in the middle-income trap—surpass richer economies? We aspire to industrialize, develop high-tech sectors, and compete in the global market, but we lack the deep capital buffers, cutting-edge technology, and geopolitical influence that developed economies have accumulated over decades. This disparity raises an underlying question: How do the smaller nations such as Malaysia end up being major players in the global economy when they lack the economic clout of larger nations? How does a small nation cope in a world where the rules have been set by those who are already ahead? China once faced the same puzzle. In 1990, its GDP stood at around $360 billion, and that accounted for less than 2% of the GDP of the entire world. Skip a few decades to 2023, and China's GDP stands at comfortably more than $17.7 trillion, currently contributing nearly 18% of the world's GDP. Hardly a couple of decades back, it was only a cheap manufacturing hub with limited technological capacity. Yet, through strategic industrial policies riding on technology, China became a dominant force in electric vehicles (EVs), battery technology, artificial intelligence (AI), and renewable energy.

Can other emerging economies—particularly the smaller ones—do the same? While China's enormity enabled it to bargain from strength, the current world order is shifting. Climate change pressures, AI-powered automation, and changes in economic policies require new strategies. Therefore, what are the implications for Malaysia and other middle-income nations?

China's Industrial Policy: The Catch-Up Model?

China got mired in low-cost manufacture in the final decades of the 20th century, when wealthier nations dominated high-technology industries. It pursued industrial policies that pressured foreign firms to transfer technology and invest locally as a quid pro quo for market access. This was most evident in the car market, where overseas car manufacturers were forced to form joint ventures (JVs) with local companies, ensuring mutual technical knowledge exchange. The intention was clear: absorb foreign technology, develop home industry, and over time outperform foreign competition. The impact of such policies has been transformative. China controlled EV sales in 2023, producing 60% of worldwide volume, with BYD outselling Tesla in terms of units. It now controls 75% of lithium-ion battery production globally, led by CATL and BYD, and in AI, the world's second-largest investor behind the U.S., with Tencent, Alibaba, and Baidu being its leaders in machine learning and automation. Worth in purchasing power parity (PPP) terms, China's economic output is more than $30 trillion, and its economy is

currently the largest one in PPP terms even though it still lags behind the U.S. when measured by nominal GDP. Apart from the statistics, China's industrial quality has undergone a tremendous change. During 2001-2014, Chinese-produced car breakdown rates decreased by 75%, reducing the performance deficit with foreign players substantially. In 2014, defect rates declined by 33%, enabling local automakers to compete at the international level. This rapid change has given rise to self-reliance in core sectors, and China has emerged a global leader in batteries, EVs, and AI-based technologies. However, this model has not been as successful for every sector and group. While it has propelled China's export industries, China's rural sector and small businesses have struggled to match the country's technology-driven industrial transformation. Relying on mass industrial policy means its rewards go primarily to state-backed companies and large cities, with wealth inequality continuing to be a long-standing problem.For the smaller economies, this model will both pose a threat and an opportunity. China benefited from scale, low wages, and state control, while it could be challenging for smaller nations to adopt similar policies without sacrificing something. The big question is: ***Is it possible for smaller nations to follow a similar model to stimulate their industrialization without provoking geopolitical backlash or exacerbating inequality?***

Malaysia in the Fourth Industrial Revolution: Opportunity or Risk?

The Fourth Industrial Revolution is reshaping economies through AI, automation, and sustainability. Nations that adapt will thrive, while those that lag risk stagnation. Malaysia stands at a crossroads—can it transition from a middle-income economy to a high-tech leader? Malaysia must place strategic bets in industries with long-term growth potential. Green technology presents the opportunity to dominate solar energy, battery storage, and green hydrogen, with the global green economy expected to reach $10 trillion by 2050. The shift to renewable energy can enhance energy security, lower long-term electricity costs, and create high-value jobs. However, countries that are at the forefront of this industry, such as Germany and China, have achieved this by decades-long industrial planning and massive subsidies. Without a similar commitment, Malaysia risks becoming an importer of green technology rather than a producer. Success in this sector would be measured in terms of the percentage of power from renewables, energy import bill savings, and local production of key battery and solar components.

Semiconductors are another high-potential industry, as they power everything from consumer goods to AI-driven automation. The global semiconductor market is valued at over $600 billion annually, and Malaysia is already active in chip testing and assembly. But it still depends on foreign firms for design and fabrication, meaning it can't yet grasp the most profitable segments of the business. Taiwan's TSMC reached world leadership through focused industrial policy and government-backed R&D, proving that success in semiconductors is within reach with the correct investment. Success for Malaysia in this sector will be tracked through the growth in semiconductor exports, R&D spend in Malaysia, and the ratio of high-value semiconductor jobs created in Malaysia. AI and automation are perhaps the most exciting and disruptive fields of the Fourth Industrial Revolution. AI is predicted to contribute over $15.7 trillion to the world economy by 2030, revolutionizing industries from healthcare to logistics.

Countries that get in early on AI research, infrastructure, and policy will reap a productivity and innovation dividend. AI is one of the most open industries for small countries, in contrast to green tech and semiconductors, since it doesn't require massive physical infrastructure. Singapore has aggressively positioned itself as an AI hub through investments in AI laboratories, investing in data infrastructure, and developing regulations attractive to global tech firms. All this Malaysia can also do, but only if it prioritizes education reform, digital infrastructure development, and AI entrepreneurship. Some possible metrics of success of AI adoption would be the jobs created, AI-led businesses, and AI contribution to national GDP.

For all its potential, industrial change also involves sacrifices. Green technology, while promising, requires highly skilled labor, so legacy energy sector employees may find it difficult to make the transition. The semiconductor industry is competitive and capital-intensive, so it would be difficult for Malaysia to take a leading role without forceful policy intervention and long-term investment. AI and automation, while generating new high-wage industries, will also eliminate more jobs than they generate in the short term in administrative, retail, and low-skilled service occupations. Unless Malaysia invests in reskilling workers and institutes policies for sharing the benefits of AI-driven growth, economic inequality could rise rather than fall.

The final challenge is to ensure that industrial growth translates into real income growth for Malaysians. China's industrial policies miraculously expanded its GDP, but wage growth has lagged behind economic expansion in some sectors, leading to unrest amidst national prosperity. Malaysia stands the risk of doing the same if it prioritizes high-tech development without also addressing wage stagnation, cost-of-living hikes, and inequality. GDP growth is not alone a sufficient measure of success—purchasing power, median wages, and access to high-paying jobs must increase for industrial policies to be considered successful.

Malaysia stands at a tipping point. The Fourth Industrial Revolution will create new winners and losers, and the decisions of today will determine whether Malaysia can join the high-income group or remain mired in economic stagnation. While there is no perfect strategy, a balanced policy that marries smart industrial policy, investment in human capital, and strategic geopolitical positioning will ensure that economic transformation will serve not just the interests of corporations and investors but also those of the broader population. The question is whether Malaysia will take control of its industrial fate, or remain a follower in a world defined by others' innovation.

"Quid Pro Quo, Knowledge Spillovers and Industrial Quality Upgrading: Evidence from the Chinese Auto Industry," with Jie Bai, Shengmao Cao, and Shanjun Li. NBER working paper 27644. Conditional Acceptance at American Economic Review.

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Hello AI, Goodbye Jobs?

By: Charlotte Vigy

In 1996 a computer defeated a world chess champion for the first time. Now, computers seem to be beating humans in most everyday tasks. AI, what once seemed like a futuristic idea, is now an integral part of daily life. While it is a useful tool that answers any question in the blink of an eye, we can't help but wonder if AI will replace us. A common fear that has plagued our world is that AI will make human jobs obsolete—ultimately replacing working people in industries ranging from customer service to data analytics to simply driving a car. The truth is we can't predict the future, but educated guesses can be made.

Two things our global economy has been challenged with are aging populations in advanced economies along with low productivity in economies that are developing. According to Barclays' AI Revolution Report (2024), AI can help combat both these obstacles, as it is accessible and efficient.

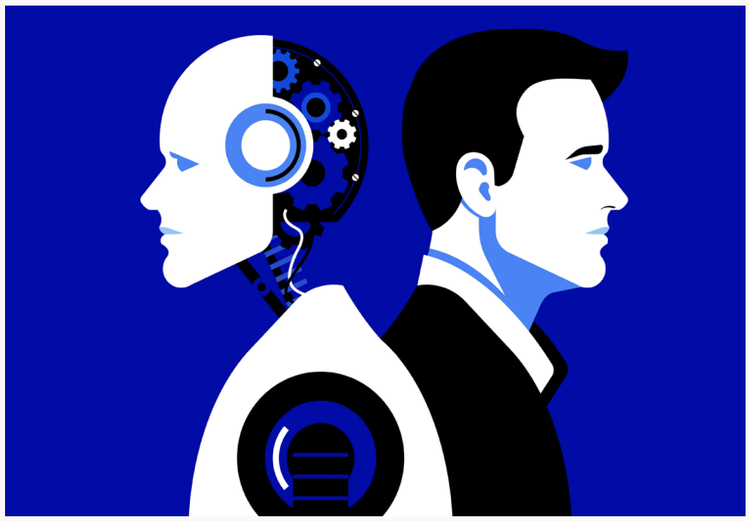
Trends show that economically developing countries such as India, Mexico, and Middle Eastern countries are experiencing a decline in their manufacturing sectors premature to their expected levels of wealth (Rodrik 2015). This is known as "premature deindustrialization." Its negative impacts mean that the country that is affected no longer gains the "productivity" and "real income" that they experienced during industrialization. Incorporating AI within these countries would allow it to play a key role in boosting productivity in the workforce and ultimately taking over as the "new industrialization" as stated by the Barclays report (2024). This predicts potential for growth in economically developing countries.

Continuing potential growth due to AI will not only be seen in underdeveloped economies, but also worldwide. Goldman Sachs has predicted a 7 percent—or more precisely a $7 trillion—global increase in GDP over the next 10 years as a result of AI. This is because as AI continues to integrate itself, routine tasks are expected to become increasingly automated. This predicted boost has been analyzed from AI's incredible speed at processing information and analyzing data, which in turn drastically cuts down time spent by workers on such tasks. This allows more time to be allocated for decision-making, communication, and overall efficiency in the workplace (Hernandez, Kim, and Singh 2023).

This is a necessity in declining populations. Numerous economically developed countries are experiencing aging populations, such as Russia, Italy, Germany, and more. Countries with aging populations have been suffering due to declining birth rates and are consequently facing labor shortages (Barclays 2024). By leveraging AI to boost workforce efficiency, countries with declining populations can sustain economic growth despite these labor shortages. It is clear that AI has the power to serve as an important tool to counteract labor shortages, support industrial development, and drive economic growth—offering a new path for nations facing demographic and economic challenges.

While AI has a promising future, these advancements have raised concerns regarding job security. If AI can perform tasks more efficiently and reduce the need for human workers, what does this mean for employment opportunities in the long run? As AI seeps into the job market, it has recently been coined by Forbes as one of the most disruptive technologies across global economies. It has also been estimated that "as many as 47 percent of current jobs could be replaced by technology" (Stettner 2022). Another prediction by Goldman Sachs estimates a loss of 300 million full-time jobs due to AI (Goldman Sachs 2023). To avoid panic at the thought of our jobs being taken over, it is important to put things into perspective. History has shown that while technological advancements may replace certain jobs, they also create new opportunities. For instance, when ATMs were introduced, there were concerns that bank tellers would no longer be needed. Instead, ATMs allowed banks to expand services and led to more job creation in customer relations and financial advising. Similar patterns emerged with the rise of computers and the internet—while some administrative jobs disappeared, entirely new industries like software development and digital marketing emerged. This suggests that while AI may automate certain tasks, it is more likely to transform the workforce rather than eliminate it entirely.

To put it simply, AI will eliminate some careers, create new ones, and transform the workplace altogether. AI's integration into the workforce does not necessarily mean the complete and total elimination of job opportunities. Instead, it signals a shift in the types of jobs available and highlights the growing need for retraining and skill adaptation. While AI creates more opportunities for highly skilled workers, such as engineers and AI developers, it will reduce demand for lower-skilled jobs.



The term lower-skilled work refers to labor that requires little to no training or education, often involving routine duties. This includes roles such as customer service, retail, and manufacturing. The reason AI would be more impactful toward lower-skilled jobs is that routine tasks can easily be automated. Algorithms embedded in AI technology allow it to compute and automate such tasks at speeds unmatched by humans. While human workers may get fatigued doing such repetitive tasks, AI does not, allowing for quicker and more consistent results.

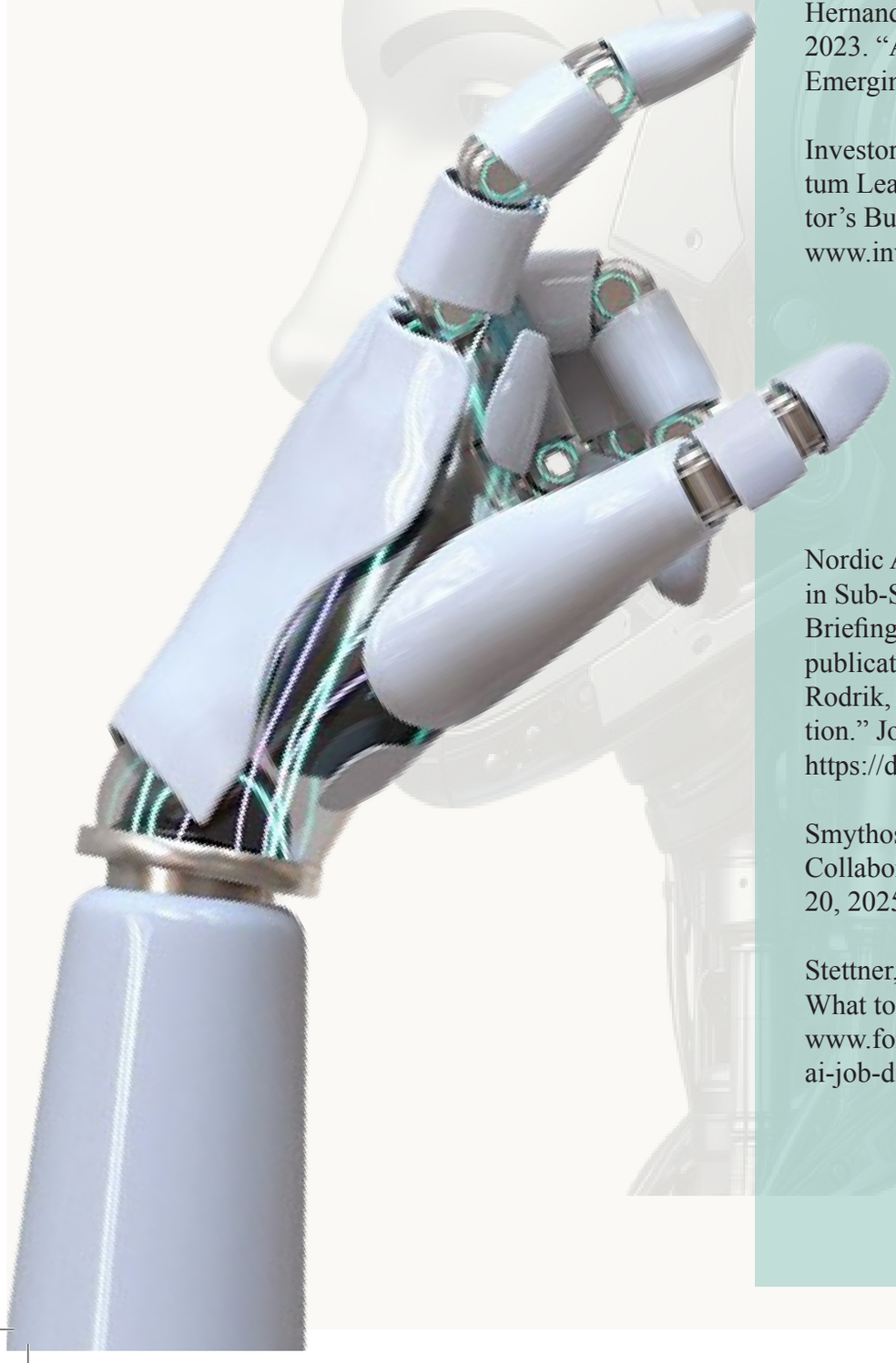
Ai will also boost and create new jobs that require collaboration and development of AI technologies. As AI integrates into different industries, workers will be expected to collaborate with AI systems. For example in fields like healthcare, professionals will work alongside AI-powered diagnostic tools to improve patient outcomes (Smythos n.d.). Another example is business settings, where AI can assist analysts by processing large datasets, allowing the human experts to prioritize their time on strategic decision-making (Express News 2024). Many jobs will become collaborative with AI—workers will leverage this technology to improve efficiency and drive innovation. In addition to jobs that will collaborate with AI, there is an increasing demand for those who can develop it. This includes computer scientists, software engineers, and those with backgrounds in machine learning. While AI has dramatically expanded in recent years, the development is far from finished. AI models are continuously being trained, researched, and structured, with a vast amount of new technologies to come. The field of artificial intelligence has created many new jobs, and it's just getting started.

As artificial intelligence shapes industries worldwide, its influence goes beyond automation and efficiency—it is also playing a pivotal role in global economic competition and innovation. Nations investing heavily in AI research and implementation are positioning themselves as leaders in technological advancement. The United States and China, for example, are engaged in a race to develop advanced AI systems, fueling breakthroughs in fields such as autonomous robotics, quantum computing, and generative AI. China's recent development of the "Wukong" quantum computer, which has achieved over 20 million remote global visits, highlights this progress (Investor's Business Daily 2024). Countries that fail to integrate AI into their economic strategies risk falling behind, as businesses seek AI-driven markets for investment and growth. However, this presents opportunities for smaller economies to leverage AI in niche sectors—such as agritech in sub-Saharan Africa or AI-powered finance services in Southeast Asia—to gain a competitive advantage. In sub-Saharan Africa, AI applications are being tested to help farmers detect crop diseases, thereby improving food security (Nordic Africa Institute 2024). As AI redefines global markets, governments and businesses must consider policies that balance tech advancement with workforce development, ensuring that economic benefits are widely distributed.

The rise of artificial intelligence is no longer a distant possibility but a present reality. AI is undeniably shaping industries, economies, and the workforce. While concerns about job displacement are valid, history has shown that technological advancements often lead to transformation rather than elimination. AI, much like past innovations, is both a challenge and an opportunity—eliminating some jobs, reshaping others, and creating entirely new fields of work. As demonstrated by AI's role in counteracting labor shortages in aging populations and boosting productivity in developing economies, it is evident that AI is not an ultimate threat but a tool for progress. However, this transition will require adaptability. Governments, businesses, and individuals must prioritize development of skill sets and education to ensure that the workforce is prepared for an AI-driven world. Policymakers must strike a balance between embracing AI's economic benefits and mitigating its social consequences, ensuring that economic growth is inclusive rather than widening the gap between high- and low-skilled workers.

Moreover, as nations compete to establish AI dominance, it is crucial that ethical considerations and equitable development remain at the forefront of innovation. The future of AI is not one of inevitable human obsolescence but rather one of collaboration—where AI enhances decision-making and automates tedious tasks, leaving humans to focus on creativity, critical thinking, and complex problem-solving. While the full impact of AI remains uncertain, one thing is clear: the future is not about AI replacing humans—it is about how humans will choose to integrate AI into our world.

"AI will eliminate some careers, create new ones, and transform the workplace altogether."



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Before You
What You Should Know Ab

By: Jessie Chen

The “No Tax on Tips” proposal has gained considerable attention during the election. It was embraced by both presidential candidates, particularly as a strategy to win Nevada, a swing state with the highest proportion of tipped workers (Bell 2024). After the bill was introduced in the House of Representatives, President Trump reiterated this commitment in a January 2025 speech in Las Vegas, aimed at relieving rising costs for service workers by allowing them to retain more of their earnings. Originating in England in the sixteenth century, tipping culture in commercial enterprises did not become prevalent in the United States until the late 1800s (Azar 2003). By the twentieth century, tipping had become very common, and today, American workers rely on tips as a primary income source more than European workers.

Many discussions have sparked among economists on whether the “No Tax on Tips” Act is merely a campaign promise or an actual beneficial policy. Although the idea of tax-free tipping sounds appealing, it is not an efficient means of supporting low-income workers. It not only raises the budget deficit and exacerbates horizontal inequity but also diverts attention from the more pressing issue of eliminating the sub-minimum wage.

In terms of efficiency, many experts argue that the “No Tax on Tips” Act is unlikely to achieve its intended goal of aiding low-income workers for two reasons. First, its coverage is too limited to address the broader population of low-income workers. According to the Budget Lab at Yale (2024), tipped occupations only accounted for less than 4% of low-wage employment.

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bout "No Tax on Tips" Act

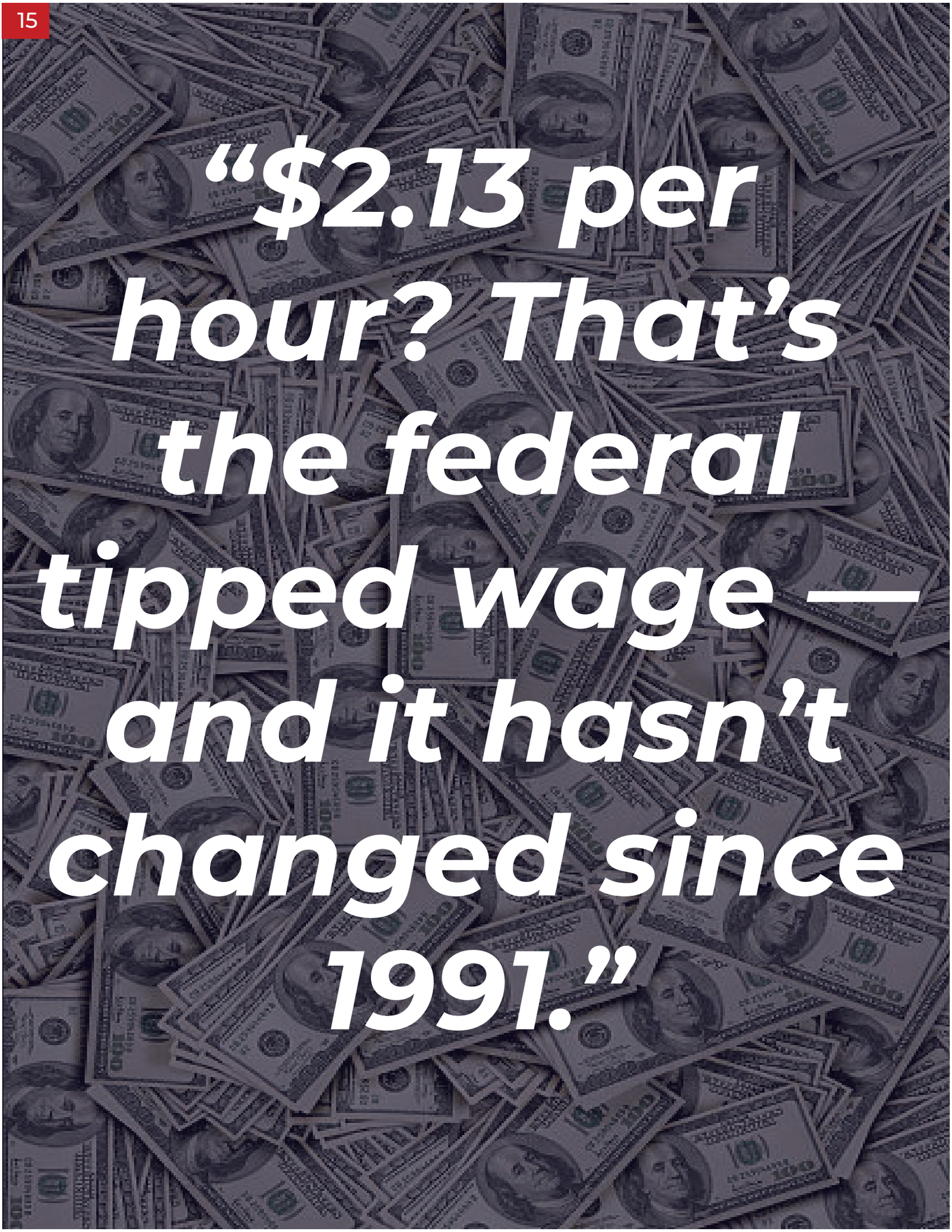
Secondly, many tipped workers already have no federal income tax liability. Approximately 37% of tipped workers earned so little that they faced no federal income tax in 2022, even before accounting for tax credits (Tedeschi 2024). These findings suggest that the direct impact of the bill is probably weaker than claimed, especially when many tipped workers would not benefit from income tax exemption on tips if they already paid no taxes.

Beyond effectiveness, the proposal draws concerns about fiscal burden. As the University of Pennsylvania's Wharton School of Business (2025) estimated, removing taxes on tips would increase the U.S. budget deficit by $69 billion over the next decade starting in 2025, assuming strict deduction to workers employed in specific leisure and hospitality sectors. The calculation accounts solely for income tax losses and assumes payroll taxes—taxes that are funded for social insurance programs like Social Security and Medicare—remain unchanged, as no additional details have been provided yet. If the bill also exempts payroll taxes on tips, a much higher budgetary cost is expected, with The Budget Lab at Yale (2024)'s estimation of $195 billion over the same period. If the government chooses to continue issuing bonds to cover the shortfall, it could force the Federal Reserve to monetize debt and consequently fuel inflation.

Exempting tips from taxation breaks horizontal equity, making tipped and untipped workers with the same income face disparate tax liabilities. Horizontal equity is the principle that individuals with similar earnings should face similar tax burdens.

According to economist Vanessa Williamson of the Urban-Brookings Tax Policy Center, an exemption would be unfair if, for instance, DoorDash drivers can frequently receive tips while UPS and Amazon delivery drivers cannot (Bell 2024). This creates an inequitable distribution of income among workers in similar positions. Moreover, it introduces distortion in the labor market. When a dollar earned through salary is taxed but a dollar earned in tips is not, it incentivizes workers to gravitate toward tipped occupations purely for tax advantages. Over time, it introduces the possibility for matriculate calculation to avoid taxation. Therefore, horizontal inequity is worsened in this case, as the unequal treatment isn't based on a progressive tax code with adjustments for family size or substantive economic differences in income type.

Furthermore, the attention on the tip taxation detracts from the more pressing issue of ending federal sub-minimum wages, a policy that allows employers to pay workers who receive tips less than the federal minimum wage. Tipped income is highly unstable, fluctuating from season to season and from shift to shift. While the federal minimum wage was last revised to $7.25 per hour in 2009, the federal tipped minimum wage has been locked at $2.13 since 1991. When adjusted for inflation using the 1991 and 2024 Consumer Price Index (CPI-U) from the U.S. Bureau of Labor Statistics, the real value of sub-minimum wage has experienced approximately a 56.6% decrease. This significant erosion highlights the urgent need to update the subminimum wage to match the inflation. Notably, raising the sub-minimum wage does not have a significant negative effect.



“$2.13 per hour? That’s the federal tipped wage — and it hasn’t changed since 1991.”

Allegretto (2013) finds that increasing sub-minimum wage boosts earnings without reducing employment for tipped workers in full-service restaurants, which employ more than 60 percent of the tipped workers population (as cited in Allegretto and Cooper 2015). This suggests that eliminating the federal sub-minimum wage would reduce income vulnerability associated with tipping fluctuations and possibly yield a net gain for workers who currently struggle to reach the federal minimum wage through tips. Therefore, compared to exempting tax on tips, adjusting the federal sub-minimum wage is a much more urgent and effective policy priority for improving the economic well-being of low-paid tipped workers.

This analysis has a few limitations. First, it is true that horizontal inequity worsens at the lower income percentile end, but its aggregate impact on closing overall income inequality across the country is less visible, since higher-income groups contribute a larger influence to the metric. Second, in the federal sub-minimum wage argument, I assume that consumers' tipping behavior remains unchanged following the introduction of the tipping tax exemption. This is based on the belief that consumers' tipping behaviors are primarily driven by service quality and longstanding cultural norms. Additionally, qualifying the net gains of ending sub-minimum wage remains unclear due to the insufficient data on (1) the size of newly taxed workers who are currently below the federal income tax threshold but would face a net income loss if their earnings exceeded the threshold post-reform, and (2) the size of newly benefited tipped workers whose current earnings are near the federal minimum wage but would experience a net income gain following the reform.

In conclusion, the "No Tax on Tips" proposal remains a contentious topic that requires careful evaluation. Many experts argue that the proposal has limited effectiveness in supporting low-income tipped workers, exacerbates horizontal equity, and overshadows the more necessary and urgent elimination of the federal sub-minimum wage.

In fact, there appears to be a lack of a clear policy rationale for the tax exemption, making it an arbitrary tax break rather than a deliberate economic policy. Additionally, it is still unknown what stage the act is in the legislative process. While it has been introduced in the House and Senate, it has not yet progressed past the committee stage. If the policy moves forward, many critical questions remain unresolved regarding the budget and effectiveness. The policy design has to be cautiously structured with clear specifications on details and targets to avoid backfires.

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The Funeral of the Penny: America's Bipartisan Farewell

By: Valery Vayserberg

One of the hottest topics on the minds of Americans is the budget deficit of the United States. In 2024, the deficit was a whopping $1.83 trillion, bringing the nation's debt to nearly $36.5 trillion. There has been renewed energy from the current administration to reduce government spending in hopes of reducing the debt through the creation of the Department of Government Efficiency (DOGE). While many of the funding cuts have been strongly opposed by members of the opposing party and general citizens alike, there has been one issue which seems to remain bipartisan: stopping the production of the penny.

On February 9th, 2025, President Trump took to Truth Social to state, "For far too long the United States has minted pennies which literally cost us more than 2 cents. This is so wasteful!" This then led to an order to his Secretary of the Treasury to stop minting new pennies. The president's move is another step in a decades-long battle which can be traced back to the 1990s with Phillip Diehl, a Democrat who ran the U.S. mint department and has advocated for the removal of the penny. In the present day, Democratic governor Jared Polis of Colorado voiced support for Trump's penny-eliminating proposal.

This belief isn't one only held by politicians and government officials: it is also held by the people. A 2022 study conducted by Data for Progress, a left-leaning think tank and polling group, found that 58% of voters believe the United States should stop producing the penny, as shown in Figure 1.

It is important to note that this high level of approval occurred during a heavy inflationary period, with inflation reaching up to 9.1% (U.S. Bureau of Labor Statistics), although Americans who are in favor of penny-abolishment should have little to fear, as this movement has persisted for decades. Economists have also determined that, based on principle, this should be a bipartisan issue. Robert Whaples, an economist from Wake Forest University, claimed in 2012 that this issue should be championed by both political parties for the following reason: conservatives are concerned with minimizing governmental waste, and liberals are concerned with minimizing environmental waste.

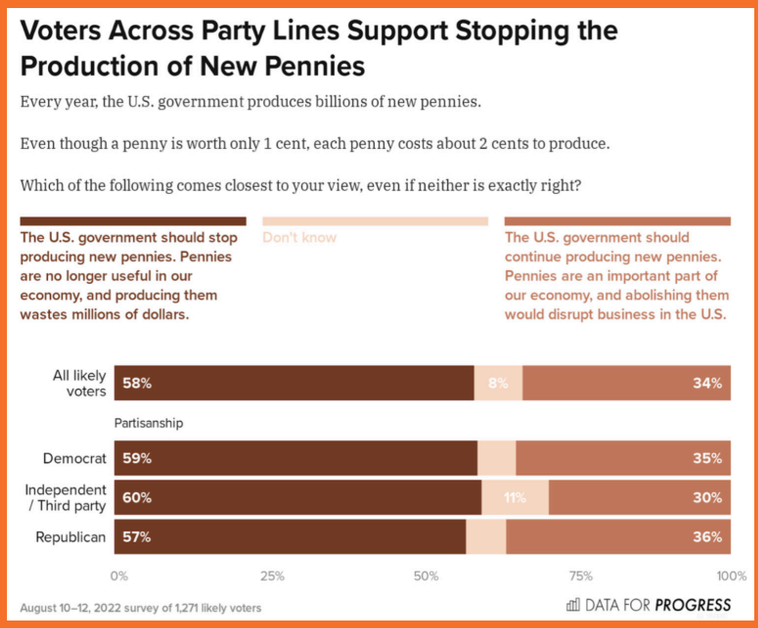

Figure 1. Data for Progress

“This issue should be championed by both political parties… conservatives are concerned with minimizing governmental waste, and liberals are concerned with minimizing environmental waste.”

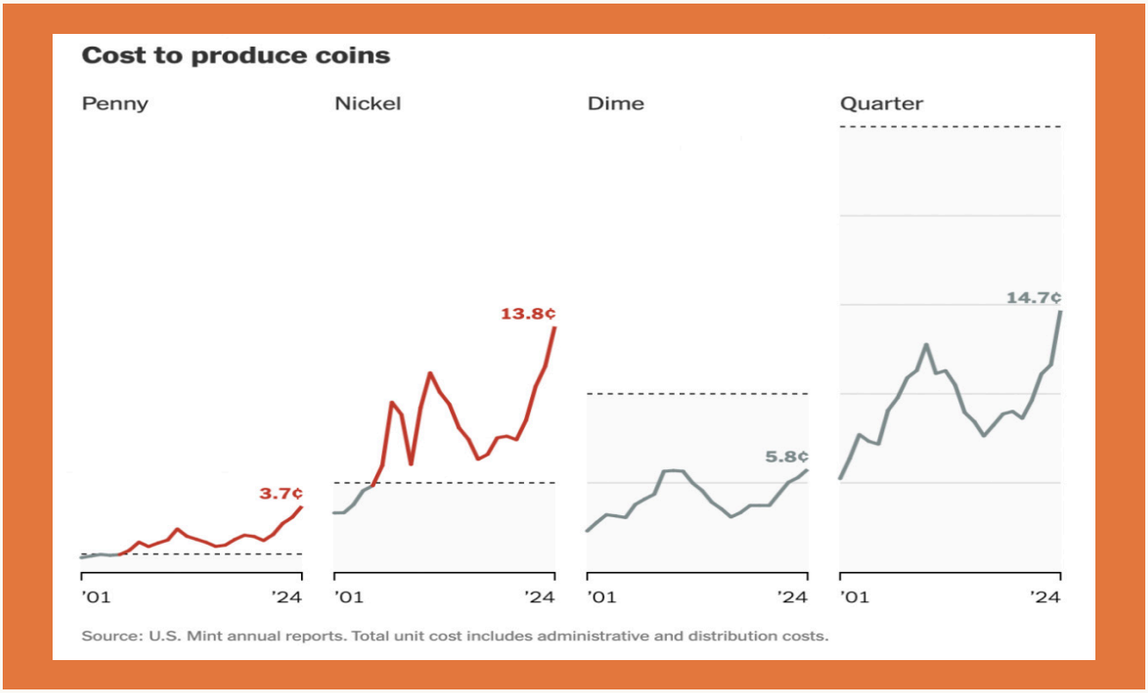

Figure 2. United States Mint Department

The use of the penny and production costs have an inverse relationship. After the COVID-19 pandemic, consumer behavior drastically changed in regards to payment methods. In research conducted by the Federal Reserve Bank of San Francisco (2023), it was found that by 2022, cash payments were down 13% compared to 8 years prior. Yet according to the U.S. Mint Department (2018) the cost to produce a penny has increased 52.6% in the same time period.

Not only is the penny effectively useless for the average consumer, it is damaging to the environment. The Central Bank of the Republic of China, for example, emphasizes the uselessness of loose change and states, "When people don't use their coins and leave them at home, the central bank then has to produce more to meet demand, which raises the bank's costs and also produces more carbon emissions." Therefore, the costs far outweigh the benefits for mining additional minerals for the purpose of penny creation. There may be concern over this policy proposal for a multitude of reasons, including upcharges seen on everyday products.

While there is public concern over this topic, economists have disagreed over its impact. Robert Whaples, who was previously mentioned, addressed some of these concerns in his research, titled "TIME TO ELIMINATE THE PENNY FROM THE U.S. COINAGE SYSTEM," (2007) which served to disprove the findings of Raymond Lombra, who in 2001 claimed eliminating the penny could have serious adverse effects.

Lombra examines the "rounding tax" which is the commonly held idea that, if the penny were to be eliminated, prices would more often increase to the nearest increment of 5 rather than lower in price. Yet Whaples points out that most items are taxed regardless, and that in Canada, one of the most infamous cases of removing one-cent payments, the rounding tax nearly does not exist. The argument Whaples makes can be summarized as follows: "The number of times consumers' bills would be rounded upward is almost exactly equal to the number of times that they would be rounded downward," with a minimal impact of a one cent increase in price every 40 purchases.

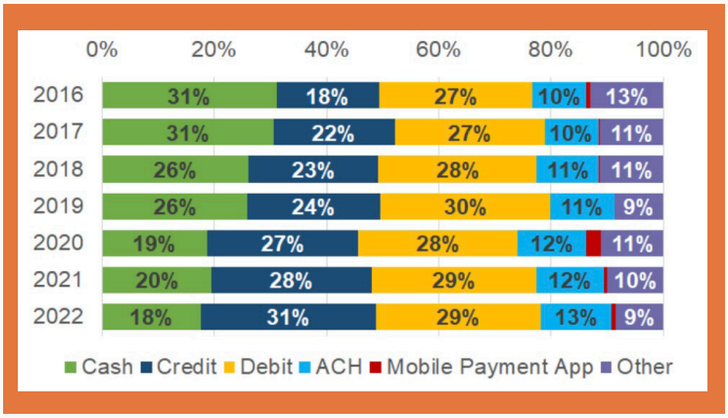

Figure 3. San Francisco Federal Reserve

This isn't a radical proposal; in fact, the United States could be considered late to the game. Canada ended production of their one-cent coin in 2012, with Sweden and New Zealand halting production in 1972 and 1990 respectively (Associated Press, 2025). Australia followed the same timeline, by stopping production of their one and two cent coins in 1992.
If they can do it, why can't we?

You are only as strong as your weakest link, and the weakest link of the United States physical currency is the penny. With high minting costs, decreasing usage of cash and coins, environmental damages, strong public support, lack of a strong case of keeping the penny, and an extremely rare case of bipartisan support, there seems to be no clearer choice: the penny's time is over.
Will Trump's proposal finally make this dream happen? Will the next coin to go be the nickel until cash is entirely ruled out? Only time will tell, but for now, refrain from saying "a penny saved is a penny earned," before it fades into obsolescence.

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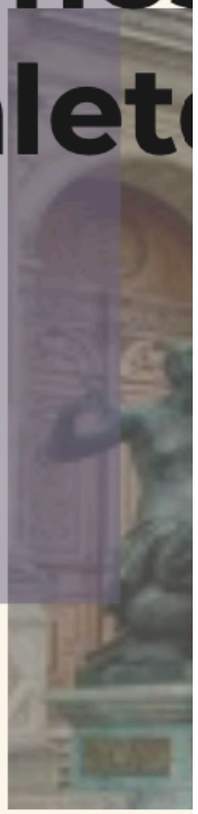
From Medals to Markets: The Economic Impact of Summer Olympic Games on Host Nations and Athlete

By: Brad Huseby

Every four years, the world comes together to watch the Summer Olympics. While these games are a spectacle with flashy new stadiums, newly designed medals, and a captivating opening ceremony, the profitability of the games is not always discussed. These summer games are anything but cheap to host. Hosting the 2024 Summer Games cost 8.7 billion dollars and every nation that has hosted the games since 1984 has learned this the hard way. Since the 1984 Los Angeles Summer Olympics, the games have time and time again proved to be more costly than profitable. The primary economic burden of hosting the Summer Olympics stems from the unsustainable infrastructure requirements imposed by the International Olympic Committee, which pressure host cities to build extravagant, often temporary venues that offer little value beyond the Games themselves.



Economic Factors

Since the modernization of the Summer Olympics in 1896, the games have been a pricy endeavor. For example, in 2016, Rio de Janeiro was selected to host and spent a staggering 23.6 billion when all was said and done. Rio de Janeiro did not plan on spending this much in the beginning. They overran their initial estimates by over 350%. One of the factors that led to this overspending was regulations forced upon them by the International Olympic Committee, or "IOC". The IOC mandates a host city to have 40,000 hotel rooms available for guests, and Rio de Janeiro before the games had only 25,000. Rio de Janeiro had to build 15,000 rooms for guests as well as substantially upgrade transportation to meet IOC standards. Fast forward eight years, the summer games found themself in Paris, France. This time, the games were not quite as expensive. Eight years later, the games cost just 8.7 billion dollars, and Paris only overran their initial estimates by 15%. A few contributing factors to this notable drop in price were the presence of preexisting high-quality infrastructure. 95% of the buildings used for the games were already built. The only three venues that needed to be built from scratch were the aquatics center, which cost around 190 million dollars, the 150 million dollar badminton and gymnastics venue, and the 1.6 billion dollar Olympic Village. While these three venues alone equate to just shy of 2 billion dollars, Paris was in a much better financial position than the majority of cities before it. The summer games are thought to have brought over 11 billion dollars into the Paris metro economy, more than the 8.7 billion it cost to host the games. This number is not and cannot be attributed as a profit for the Paris Olympic

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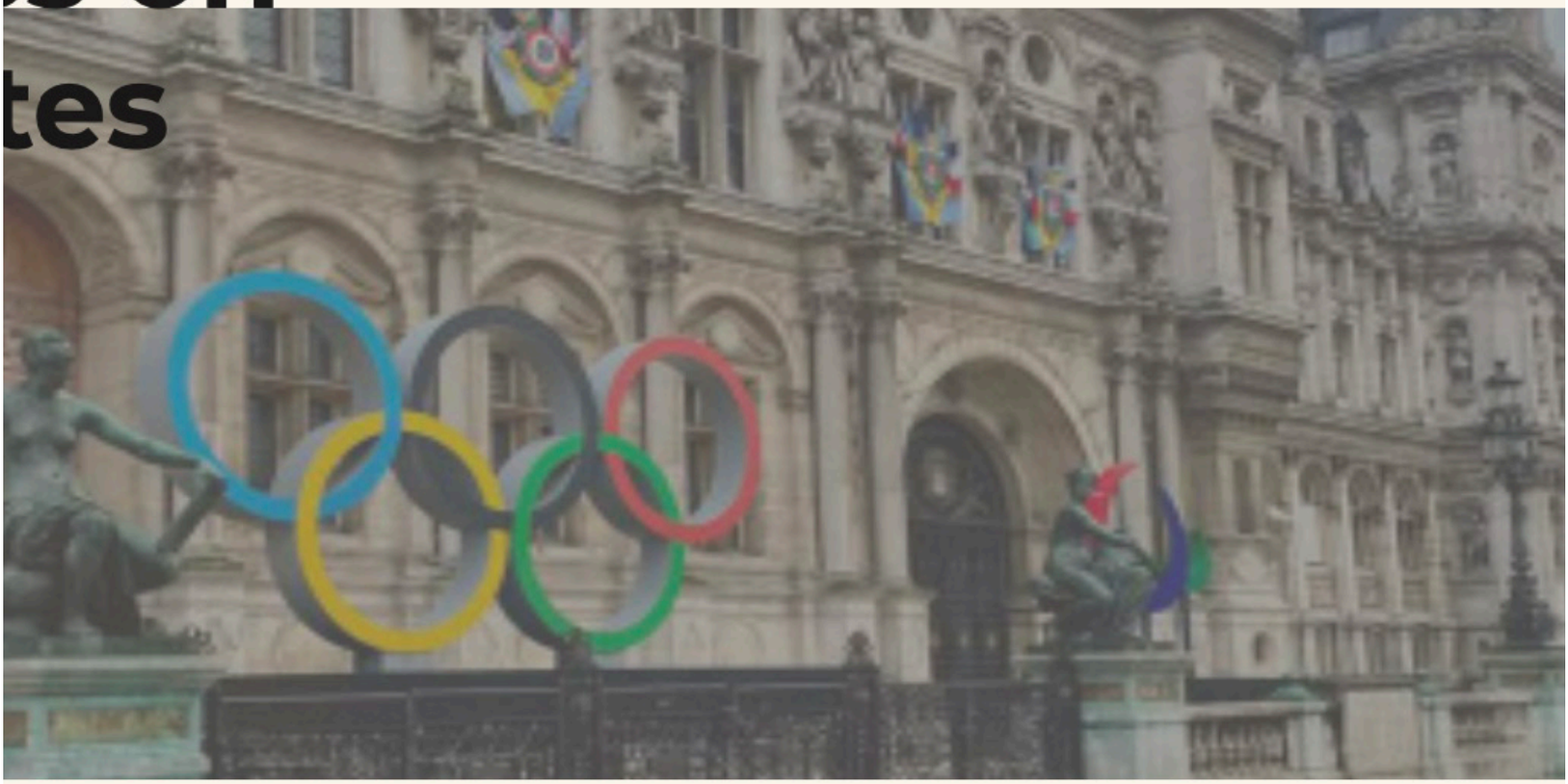
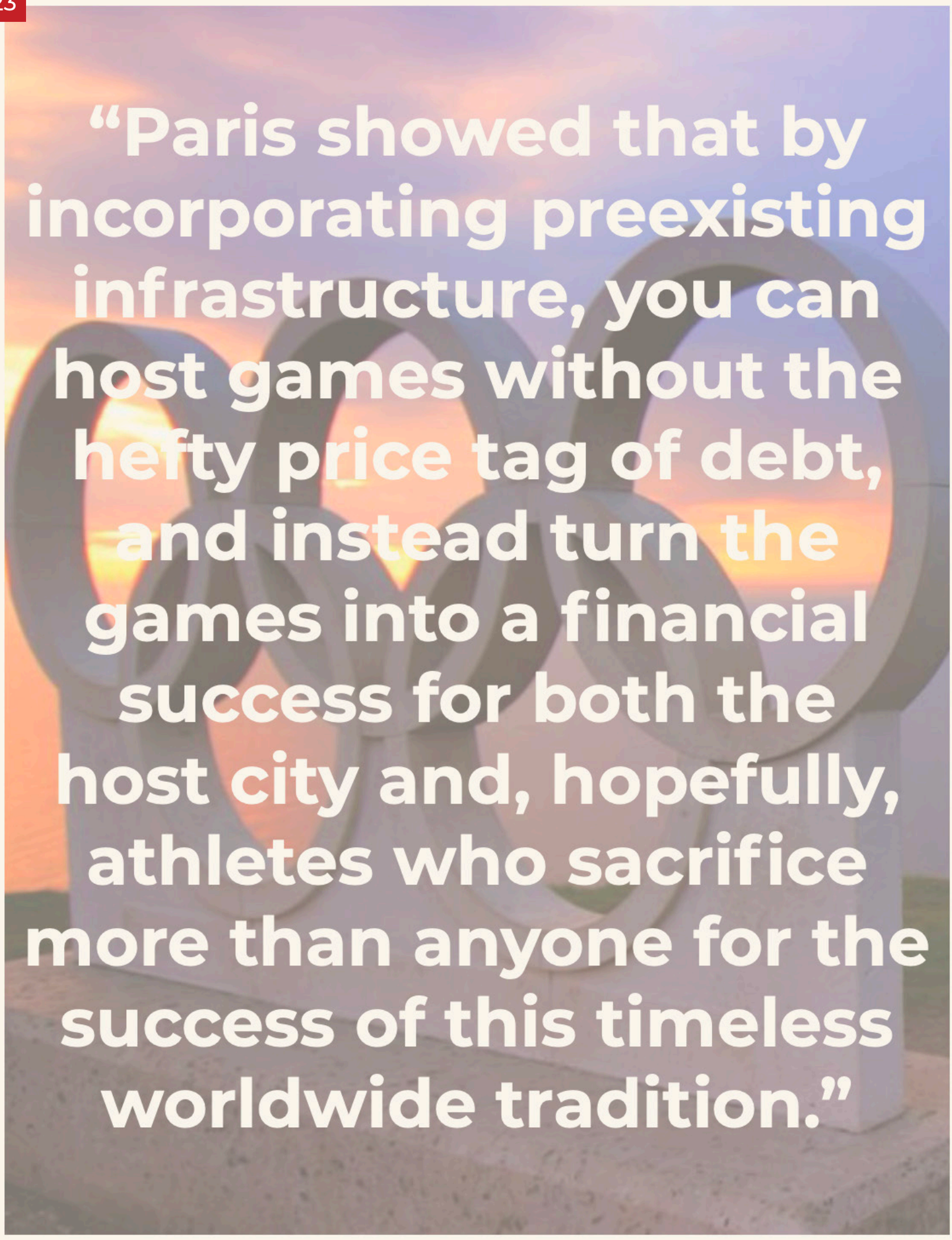


committee, but it does show the world the merit that hosting the Olympic games can have for a city with the right infrastructure. In an era where hosting the Olympics is seen as a risky venture, the success of the 2024 Paris Games is working against that narrative.

Athelete Funding and Compensation

While the biggest financial impact of the Olympics is on the host city, the games can also have financial implications for the athletes. Each country has its own budget for athletes who have qualified for the games as well as for athletes who place gold, silver, or bronze in their respective events. In America, the majority of Olympic athletes supplement their athletic training and competitions with a part-time or full-time job to support themselves. With the exception of a select few the majority of athletes are not participating in professional sports with high wages. Athletes are sacrificing a lot to be at the pinnacle of their respective sports. While most countries compensate athletes who come home with a medal, the amount of money they receive widely varies. In Hong Kong, gold medalists receive north of 700,000 dollars from the government for their athletic achievement, compared to the United States, where athletes who strike gold claim just 37,500 dollars. In the United States, under current economic conditions, a salary of 37,500 a year is on the edge of minimum wage. Athletes are dependent not upon the check they could receive, but instead on sponsorships. While the sponsorship data for all Olympic athletes is not always public and accessible, a few of the top athletes have public sponsorship deals. For example, Katie Ledecky signed a 7 million dollar deal to represent TYR from 2018-2024, and Simone Biles is estimated to make at least 5 million dollars a year, according to a Forbes estimate, from various sponsorship deals with major companies


“Paris showed that by incorporating preexisting infrastructure, you can host games without the hefty price tag of debt, and instead turn the games into a financial success for both the host city and, hopefully, athletes who sacrifice more than anyone for the success of this timeless worldwide tradition.”

such as Facebook, Uber Eats, and Oreo cookies. While these are just two athletes in the top 1% of earners, these numbers are promising for all Olympic sports athletes.

Discussion

The Olympic Games, while an expensive endeavor, can give back substantially to the local economy and bring Olympians' dreams of stardom, fame, and fortune with them. Do you believe the current economic system for compensating athletes makes sense? Should a gold medal at the Olympics for an American athlete warrant an athlete a check for more or less than 37,500 dollars? How can Olympians create a way for their sport to pay for their lifestyle without the addition of one or two other jobs? The Summer Olympics are one of the timeless traditions that unite the world. What changes can we make to continue this tradition of celebration and unification for generations to come? The Summer Olympics are a spectacle and provide the world with a wealth of entertainment for two weeks every four years. As Paris proved to the world in 2024, the games are not necessarily an economic disaster, as the media has portrayed them to be following the games in Rio and Tokyo. Paris showed that by incorporating preexisting infrastructure, you can host games without the hefty price tag of debt, and instead turn the games into a financial success for both the host city and, hopefully, athletes who sacrifice more than anyone for the success of this timeless worldwide tradition.

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Tariffs: Winners, Los

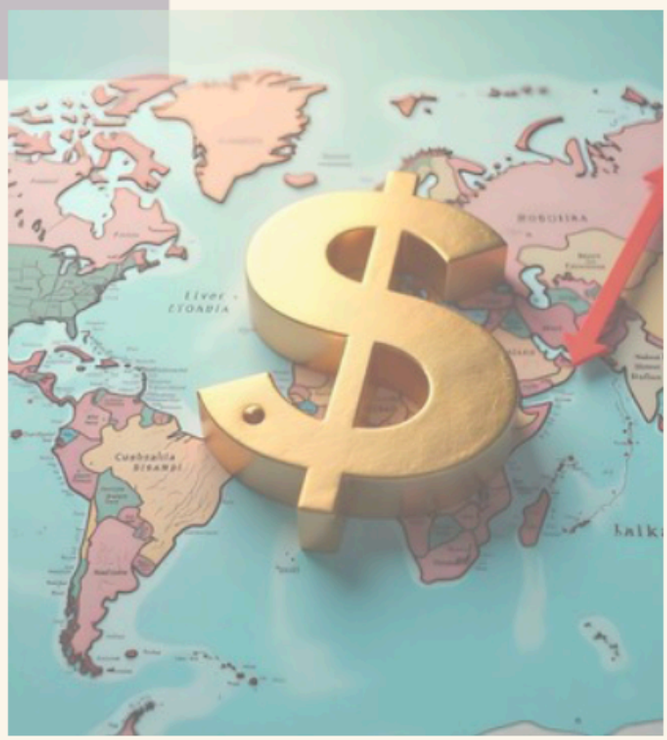
By: William Spahn

What actually is a tariff? Millions of Americans asked themselves that same question in the runup to the 2024 Presidential election. In recent years, there has been much debate about U.S. trade policy and tariff policy in particular. According to Google Search trends, the topic "Tariff" surged by a factor of nearly eight in mid-November compared to early October 2024, and reached a record high in searches in early February after the President's announcement of increased tariffs on Mexico, Canada, and China (Google 2025).

At their core, tariffs are a tax on U.S. imports, burdening both producers and consumers. While importing firms are the ones who actually pay the tariff to the government, in order to sell their goods in the U.S., they can pass much of the price increase onto the consumer by raising the prices at which their products are sold. Government revenue from the tax will largely be dependent on how effective it is at reducing imports. If consumers bear a higher portion of the burden and reduce consumption as a result, the tax will earn less revenue. If producers let the tax eat into their own revenue and lessen the burden on consumers, then consumption will fall less dramatically and lead to higher revenue from the tax since demand won't fall as much.

Tariffs can often be compared with sales taxes. Now, tariffs are different from a sales tax in several ways. For one, consumers can try to avoid the tax by substituting domestic products in place of imported ones. However, increased demand for domestic products over time will increase the price to effectively match the post-tax price level of the imported product. Given time, market forces push the prices of both domestic and taxed imports to an equilibrium—an effect known as the law of one price. This equilibrium is often between the original prices of the domestic and tariffed products. Unlike goods targeted by an across the board sales tax, U.S. imports are affected not just by the price of the goods (which is affected by tariffs), but also the price of the foreign currency relative to the U.S. dollar. If demand for foreign products in the United States declines, so too will the price of the foreign currency relative to the U.S. dollar. On the other hand, this will cause the U.S. dollar to appreciate or gain value relative to the foreign currency, and increase the purchasing power of the American consumer. It's important to note that the "depreciation" of the foreign currency will reduce the effectiveness of the tariff by offsetting some of the price increases, but not all of it (Yale University 2025). Moreover, a stronger dollar will make U.S. exports more expensive and less attractive in foreign markets, hurting U.S. exporters.

Economists are generally opposed to the use of tariffs in trade policy (Furceri et al. 2020). Tariffs are rarely one-sided; often, countries will impose retaliatory tariffs aimed at hurting consumers in the other country more than they are. This can result in a cycle of increasing tariffs and other economic measures to weaken the economy of another nation: a trade war. When tariffs are imposed on goods, they disrupt the previous equilibrium determined through voluntary exchange, meaning that consumers are often worse off due to higher prices. Foreign firms also experience a decline in sales revenues. Domestic firms, however, in import-competing sectors benefit from trade protectionism as they enjoy greater market power, allowing them to charge higher prices and have higher profits even in the absence of retaliation. Given that there are more consumers than producers, this could still be considered a net loss. Nonetheless, It may be in some cases that there are externalities that render tariffs worthwhile in



sers, and Casualties

order to achieve certain national interests.

Since its inception, the United States has sought to protect its domestic manufacturing industry. Tariffs had long been a key part of policy efforts aimed at boosting U.S. domestic manufacturing throughout the 19th and early 20th centuries, yet the post-war era was dominated by proponents of free trade, generally opposed to unnecessary tariffs. In the aftermath of the 2008 recession and NAFTA, the debate over protecting the U.S. manufacturing industry has been revived. It's unclear though how new tariffs may impact manufacturing in the 21st century. Even past results were mixed. From 1870 to 1909, the United States maintained high tariffs on manufactured goods that were successful at increasing overall manufacturing output, value added, and employment, yet labor productivity declined during the same period as a result (Klein and Meissner 2025). In the last decade, the U.S. has started to revisit previous tariff policy as a means of incentivizing firms to manufacture products in the United States as opposed to offshoring jobs. Subsidies for firms producing domestically were introduced in 2022 as an alternative to increasing tariffs already in place, intending to onshore manufacturing jobs (Blevins et al. 2023). Unlike in the 19th century, the manufacturing sector faces the impact of labor-replacing technologies and artificial intelligence, complicating any prediction of the effects of new or increased tariffs on manufacturing employment and the sector at large.

Tariffs aren't solely imposed on final goods and services, in fact, the United States has maintained 25% steel import tariffs since 2018 (Bond et al. 2025). Due to its common role as an intermediate good, steel prices can significantly impact the prices of its subsequent utilities in manufacturing and construction. For this same reason, the U.S. government had an interest in protecting the industry in case of war or national catastrophe that would hinder access to foreign steel. Steel is an important component in motor vehicle assembly. Just as the price of motor vehicles can increase if a tariff were to be imposed on them, a tariff on one of its components can have the same effect.

Oil is an input required for not only energy production, but many products sold in the United States. In 2024, the United States imported an average of over four million barrels of crude oil every day from Canada (Reuters 2025). Since it must be refined before being used for an

expansive array of applications, fluctuation in crude oil prices could significantly impact the U.S. economy. Now, even as tariffs on Canadian energy imports are being considered, it's impossible to know the exact effect they might have on the U.S. economy. Consumer behavior, trade retaliation, and the U.S. dollar foreign exchange rates are just a few of the many factors changing by the day, shaping the function and role of tariffs in U.S. economic policy.

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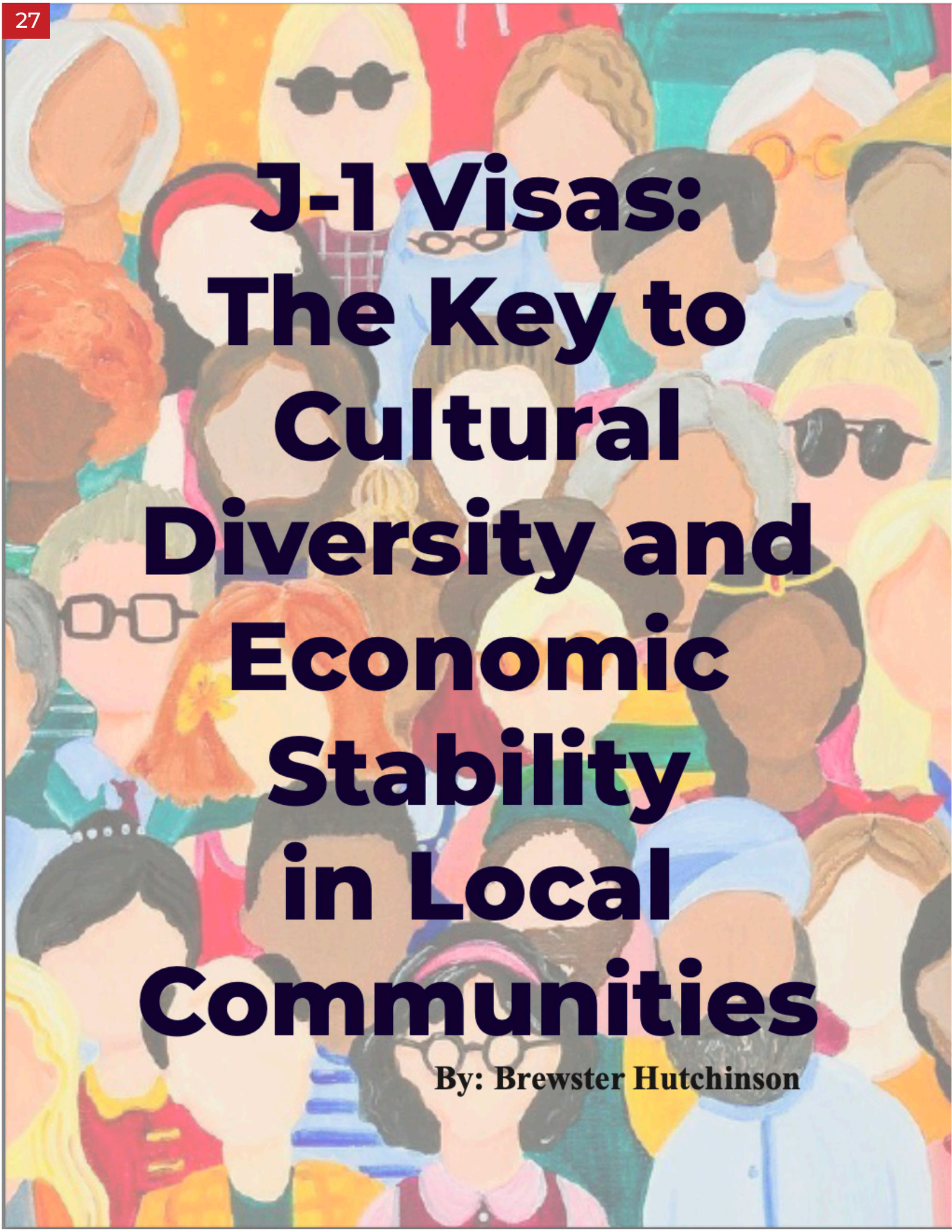

J-1 Visas: The Key to Cultural Diversity and Economic Stability in Local Communities

By: Brewster Hutchinson

J-1 visas are temporary, nonimmigrant visas granted to international research scholars, students, professors, and laborers with the goal of promoting cultural exchange while simultaneously stimulating the American economy through providing short-term labor and transfers of knowledge. According to the US Department of State (2023), around 300,000 participants come stateside from over 200 countries each year on J-1 visas to contribute to the American economy, and indirectly to the culture. The current Trump administration, however, is poised to implement measures to restrict the entry of temporary migrants into the United States. Figure 1 visualizes the amount of legal immigration into the United States for each president from 2015 to 2023. In Trump's first term as President, there was an 82% reduction in temporary visa issuances, though the vast majority of this decline occurred in 2020 due to global disruptions caused by the COVID-19 pandemic. To demonstrate that legal immigration was decreasing in Trump's first term even before the pandemic, J-1 issuances in only the first two years were analyzed to remove any COVID-related influences. For comparison, the same data was

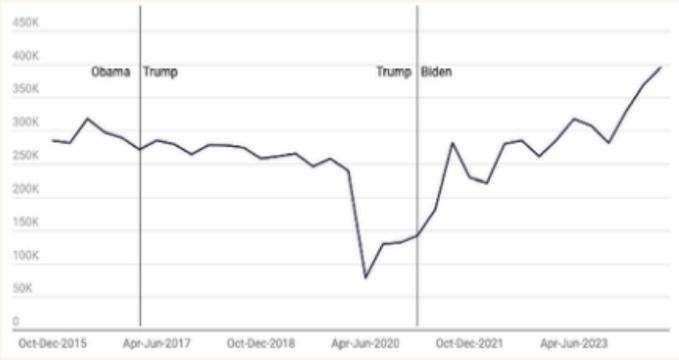

Figure 1. (Source: cato.org. This graph plots the quarterly number of new legal permanent residents in the United States vs. time. Vertical lines mark administration changes.)

drawn from the first two years of Obama's second term and Biden's first two years in office. From 2013 to 2014, President Obama oversaw a 5.94% growth of the J-1 visa program. From 2021 to 2022, President Biden presided over a 119.4% growth of the J-1 visa program on the heels of the pandemic. However, from 2017 to 2018, President Trump oversaw a 0.34% decrease in the J-1 program, and in 2018, the highest percentage of J-1 visa applications were rejected of any year analyzed (15.6% of all J-1 applications were rejected in 2018). As the only president in the last decade to shrink the rate of temporary immigration, all signs are once again pointing toward a reduction of the J-1 visa program in the coming years.

Trump's first term rhetoric frequently blamed migrants from Mexico for issues such as high drug use and crime rates, and in 2025, Trump has already taken action to implement rigorous vetting and screening of immigration applications, claiming these measures will "protect the United States from foreign terrorists and other national security and public safety threats," (Anderson, 2025). These measures are likely to increase visa wait times at U.S. consulates, making temporary visas more difficult to attain. Decreasing the number of J-1 visas granted to foreigners or increasing the barrier to acquire them would harm America by eroding the labor market for temporary and seasonal jobs in local communities, shutting down valuable transfers of knowledge, and reducing cultural diversity and global perspectives across America.

If the Trump administration were to uphold their promise to decrease legal immigration, the United States would forfeit valuable talent, innovation, and diversity across a wide array of industries and disciplines. Nonimmigrant visa holders learn valuable skills in America while simultaneously disseminating their own traditions and culture to other Americans. The J-1 visa program began in 1948, when Congress aimed to bring together Americans and foreigners to "correct misunderstandings about the United States abroad," (Cruz, 2005). Integral to the inception of this program was the notion that the exchange visitors must return to their own countries for a minimum of two years upon expiration of their visa in order to share their experience in the US with people of their home country. Since then, new-era Republicans have drastically shifted the narrative surrounding immigration, even temporary, from a positive transfer of knowledge and important facets of global communication to a problem: an entity that harms America through job theft, a burden on the US economy, a damper on the wage market, or other potential drawbacks. In reality, research shows that immigrants boost America's GDP (gross domestic product) — Costa and Shierholz (2024) forecast that immigrants will contribute to a 2% boost to America's real GDP at current immigration levels. Moreover, an influx of immigrants would help lower the senior-to-working-age ratio in America by "offsetting an expected decline in the working-age population from retiring Baby Boomers," (Moslimani and Passel, 2024). An added benefit of lowering the senior-to-working-age ratio through increased immigrant labor is that more workers (including temporary immigrants) would pay into America's

social security system, helping to stabilize this system and support benefits for retirees.

Certain local labor markets are heavily reliant on J-1 workers in the summer or winter to fill labor and employment gaps, particularly in tourism-dependent areas or regions that rely on high agricultural output. J-1 workers often migrate to these markets to fill seasonal employment needs. Take Wisconsin Dells as an example: Wisconsin Dells is home to America's largest outdoor waterpark—located just an hour north of Madison—and their community depends on J-1 visa workers to support their tourism-driven economy. Wisconsin Dells has a working-age (19 years or older) population of 2,269 citizens, with a total population of 2,942 as of the 2020 census. Despite their small population, the community relies on over 5,000 J-1 workers to support their tourism (Torres, 2024). Kliese (2019) asserted that the Dells are the second largest employer of J-1 students in America. J-1 visa holders, like the thousands of international citizens that travel to work at the Dells, are a crucial piece in supporting Wisconsin's tourist economy, one that Wisconsin Governor Tony Evers (2019) declared generates almost 200,000 jobs and over $1.6 billion in state and local revenue annually.

If several thousand of potential J-1 visa workers are denied entry to the United States, places like Wisconsin Dells would begin to struggle to staff their tourist attractions, as young Americans are becoming less and less interested in non-specialized work. The National Immigration Forum (2018) claims that at an increasing rate, 16 to 24-year-old Americans are enrolling in summer school or pursuing internships, demonstrating a shift away from low-skilled summer jobs toward professionally oriented opportunities — a trend reflected in the fact that the share of 16- to 24-year-old Americans enrolled in summer school has tripled over the past two decades (Bureau of Labor Statistics, 2011). With this trend present among American citizens, J-1 visa workers will become more valuable than ever in America — steady or even increasing levels of temporary immigration would be in alignment with American workforce trends, as demand for low-skill labor remains high and as immigrants continue to fill these labor gaps.

While a widespread narrative is that 'immigrants steal American jobs,' the reality is that the American economy does not have a fixed number of jobs — the economy grows, and as it grows it creates new jobs for both US workers and migrant workers. As Costa and Shierholz write (2023), immigrants fill gaps caused by demographic changes and contribute to strong economic growth by playing key roles in a variety of industries and "complementing U.S.-born workers by contributing to overall population and workforce growth." If the Dells see a decrease in temporary migrant workers, firms would have trouble staffing tourist attractions, thus decreasing the amount of overall tourism revenue generated. This loss of tourism revenue would go on to decrease the tax revenue at the local, state, and federal level. All in all, this would cut back on public service ameliorations and infrastructure improvements to local economies and would likely raise the tax burden on local residents.

On another note, temporary immigrants add valuable diversity and global perspectives to American communities, benefitting both the migrants and American citizens. In Park City, Utah, where winter tourist attractions such as seven ski resorts and the Sundance Film Festival attract over two million tourists annually, many local shops and restaurants rely on almost 2,000 J-1 visa recipients to help support the huge amounts of tourism in the winter months (Malatesta, 2023). Similar to Wisconsin Dells, cities with high levels of winter tourism—like ski towns—are often some of the main employers of J-1 visa recipients, as workers spend the winter staffing ski resorts, local restaurants and ski shops. J-1 employees possess a unique ability to provide their American coworkers with new global perspectives. Through day-to-day interaction, they share their cultural traditions, teach their native languages and share their cultural meals. A decrease in J-1 visas would deprive American workers of valuable interpersonal experiences that bring diversity into smaller local communities. More broadly, these cultural exchanges facilitate the development of innovation and foster a more productive local economy as knowledge and ideas disperse across borders.

All things considered, the J-1 visa program leads to a net gain for both the American economy and culture. In the short-term, J-1 exchange workers help to stimulate the American economy, especially in communities with high levels of tourism. The evidence portrays immigration as a boost to GDP, a stopgap to fill labor shortages, and an entity that increases the labor participation rate while keeping America's workforce young. In the long-term, the J-1 visa program creates cultural links that give foreigners opportunities to experience American culture while simultaneously sharing slices of their own culture, helping Americans to learn

foreign perspectives. With a whirlwind of political changes looming over the next four years, the J-1 visa program must be prioritized in order to support local communities both economically and culturally. A decrease in the amount of J-1 visas issued to foreigners would be detrimental — the US would lose out on valuable labor force participants that support local communities and foster intercultural interactions that make humans more well-rounded.

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WARM COMMODITIES:

Carbon Offsets Exchanges and the

By: Jonathan Minnis

Few subjects have been given as much attention as the topic of Climate Change, in both scientific and colloquial discourse. Increasingly, climate change has become a definitive topic of the business world, as waves of climate regulatory policy and capitalist pushbacks have slowly but surely changed industrial practices, consumer choices, career moves and business postures.

Of course, the climate-aware industry has been on the scene en masse since the marketing world grasped the potential of "greenwashing" their products. For years, customers have been hoodwinked with appeals to their climate ethos and varying degrees of effort to decarbonize the supply chain. Though savvy consumers have caught on, the court of public opinion is not the only threat to businesses with respect to their environmental impact.

Legislative efforts and regulatory agencies have made attempts to modernize and refine the process of requiring not only baseline emissions standards but climate-related transparency throughout industry. Various methods of government intervention have had mixed success in cutting down on greenhouse gas emissions (GHGs). Blame shifting and deferring responsibility can get in the way of writing effective policy. Debate concerning who should answer for the disparate harms of cumulative and projected GHG emissions has been nuanced.

Particularly for disasters of the environmental variety, reactive policy generally doesn't work well. Progressive approaches to governance of GHGs haven't always performed well either. Several "carbon tax" bills have reached Congress, all with dead-on-arrival status. Acting PM of Canada Mark Carney recently axed the 2019 Fuel Charge launched by his former party leader, citing the divisive unpopularity of the consumer carbon tax (Major 2025). Some European countries do levy hefty carbon taxes, but the plurality of carbon pricing is determined on exchange platforms that trade carbon offsets.

Distinct from a carbon tax, a carbon offset (CO) is a contract that establishes a parity between carbon emissions and carbon recapture or sequestration. These two parties, referred to as the carbon emitter and carbon sink, employ one another to buy and sell a legal claim to GHGs. These "verified carbon units" (VCUs) can be thought of as a commodified negative GHG balance that the owner can expend for operational compliance or hold to sell.

There are several types of clearinghouses for CO contracts, including Emissions Trading Systems (ETS), Output Based Pricing Systems (OBPS), and Cap-and-Trade (CaT). These markets have

successfully launched in China, North America, the EU, Singapore, and recently Indonesia (Panggabean 2023). The concept of utilizing the existing financial markets to incentivize an efficient lower carbon economy is where COs show promise, though the pragmatics are hotly debated.

In 2024, an SEC final ruling, The Enhancement and Standardization of Climate-Related Disclosures for Investors, seems to have caught on to the need for businesses to blunt their climate reporting, mentioning "greenwashing" more than 20 times. The ruling elaborates, referring to the "boilerplate" disclosures that followed

ıe Financial Force of a 2024 SEC Ruling

the Commissions' 2010 Guidance, the previous guidelines for publicizing climate related information. The ruling focuses on larger companies; the lower bound for public companies subjected to the SEC disclosure requirements is a $75 million market cap, with additional exemptions for emerging growth companies (EGCs) and smaller reporting companies (SRCs), (CLEAResult 2024, SEC 2024).

The Commission spells out new expectations for tidy and consistent placement of GHG- and CO-related information in business reports. Section II.G stipulates what companies must report about their GHG goals and targets, and requires financial disclosures for instances where carbon offsets or renewable energy credits (RECs) are an integral part of a business' strategy. Applicants— the favorite SEC term for public firms— must divulge a range of qualitative and quantitative information about the source and authenticity of their offsets, and list other costs associated with their GHG emission goals.

These changes will plug holes in future audit trails and provide investors with a means of inspecting the connections between CO markets and modern industry.

Some dissenters to the ruling, notably the attorneys general of oil-producing states such as Texas and Alaska, have asserted that the SEC lacks the authority to impose these measures, though legal challenges to the ruling haven't yet fomented. Opponents of the changes complain about the administrative costs and informational bloat that will result from the overly prescriptive rules. They say that the voluntary reporting and adherence to the 2010 Guidelines is sufficient to inform investors.

Many agree, however, that the proposed adoption of standardized disclosures would tamp down the ornamental "greenwashing" and that increasing data transparency will promote good investments (SEC 2024). Apparently, the final rules are reaching the economy at a critical time. The volume of CO trading is growing at an accelerating pace, pulled by expanding energy production and pushed by state regulations. Global volume of CO trades reached $7 billion in 2024 and is projected to triple to more than $21 billion by 2029 (Technavio 2024, p.46). The bulk of carbon offsets are generated by a few large providers of carbon capture and storage (CCS). Firms in the CCS business can be third-party or often a segment of an energy company depending on the methods used and the storage destination, among other factors (Technavio 2024, p.75).

Looking at the global CO markets, there is a good reason to expect the continued exertion of corporate capital and market power to coax forth a better outcome for the planet's people and resources. Consider the analogy that corporations are like agents and are capable of acts of self-preservation: Assume that anthropogenic GHGs heighten risk, increase costs, and decrease consumption. These consequences do not align with fundamental corporate interests and are existential in the long-run. Therefore such corporate agents ought to react in the present to ensure their survival.

Though there are collective action problems at the core of this thought experiment, the incentive to participate in conservation and climate protection is backed by the renewed authority of the SEC. This motivates not just R&D spending but innovative climate mitigation, an effect sometimes referred to as the Porter hypothesis that has been studied for decades. Empirical research has demonstrated that CO markets reinforce the Porter hypothesis. A study conducted at

the Changsha University of Science and Technology, Changsha China, examined how the implementation of the nation's emissions trading system (ETS) affected the behavior of businesses. The study aimed to, "evaluate the impact of the pilot ETS on enterprise technological innovation."

Using regression models, the study compared regulated and non regulated firms and controlled the data to measure among industry counterparts. The researchers performed a DiD (difference in differences) policy evaluation and extrapolated the effects of the availability of CO trades on corporate innovation. The tested hypotheses considered the regulatory pressure on industry segments in connection with CO price data. Their research suggests that, after the pilot ETS implementation in 2014, research spending and patent volume of regulated firms increased by 1.4 and 2.8 times respectively, after several years of trading (Zhu, Long, Gong).

With the SEC changes coming into effect alongside existing GHG emissions standards, the increased volume of CO trade from within the U.S. could nudge things in the right direction and reward the companies best fit to be at the helm of the ensuing energy transition. What remains to be seen is what effects the international carbon market will have on currency exchange rates. For the contemporary 99%, a top-down approach to integrating the true cost of fossil fuels seems to do the least financial harm.

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The Great De

By: Urmika Banerjee

Economic development and global carbon dioxide (CO2) emissions have long been closely related, with urbanization and industrialization fueling increases in energy use and emissions. The energy sector's CO2 emissions in 2022 hit a record high of 37 billion tonnes (Gt), a 1% increase above pre-pandemic levels (International Energy Agency, 2023). Resuming economic activity, rising energy demand, and many economies' continued reliance on fossil fuels are all contributing factors.

In 2023, however, developed economies experienced a notable shift: emissions fell by 4.5% (520 million tonnes) even as global GDP grew by 1.7% (World Carbon Project, 2023). This decline, bringing emissions back to early 1970s levels, marks the largest non-recessionary drop and signals a significant structural shift away from carbon-intensive energy sources.'

The Concept of "The Great Decoupling"

While "The Great Decoupling" traditionally refers to the divergence between productivity, wages, and GDP growth since the 1970s, this paper adapts the term to describe the growing separation between economic growth and carbon emissions a vital shift shaping the future of global sustainability.

Despite this progress, China's emissions surged by 565 Mt in 2023, driven by its post-pandemic economic expansion. Still, China leads globally in clean energy investments, responsible for over half of all new renewable capacity added in 2022 (IRENA, 2023). A weak hydropower year contributed to roughly one-third of China's emissions growth, and its per capita emissions now exceed those of advanced economies by 15%. India, fueled by a strong 6.3% GDP growth, saw an increase of nearly 190 Mt of CO2 emissions (World Bank, 2023), exacerbated by a weak monsoon that reduced hydropower output and increased dependence on fossil fuels.

Trends and Analysis

In 2023, global CO2 emissions grew by only 1.1% substantially lower than the 3% increase in substantially lower than the 3% increase in global GDP (World Bank, 2023). This shift indicates a break from the historical pattern where CO2 emissions mirrored economic growth.

According to Our World in Data (2024), many high-income countries, including the US, UK, and EU, have already achieved "absolute decoupling," where economic growth continues while emissions decline. For example, between 1990 and 2020, the EU reduced emissions by approximately 30% while growing its economy by over 60%. This trend reflects structural shifts toward renewable energy, improved energy efficiency, and a transition to service-based economies. On a global scale, emissions have grown at just 0.5% annually over the past decade, despite significant GDP growth. Historically, such slowdowns were only seen during global shocks like the Great Depression and World Wars (Carbon Tracker, 2023), but today they signal a sustained decoupling trend driven by technological and structural change.

Policy Implications and Future Outlook

The decoupling is supported by four major pillars:

1. Shift to Service Economies: Nations like India and China are transitioning to service-dominated economies, with a projected 30% reduction in energy intensity by 2030 (IEA, 2023).

2. Enhanced Energy Efficiency: Energy consumption per unit of GDP has decreased by 20% over the past decade due to technological improvements (World Bank, 2023).

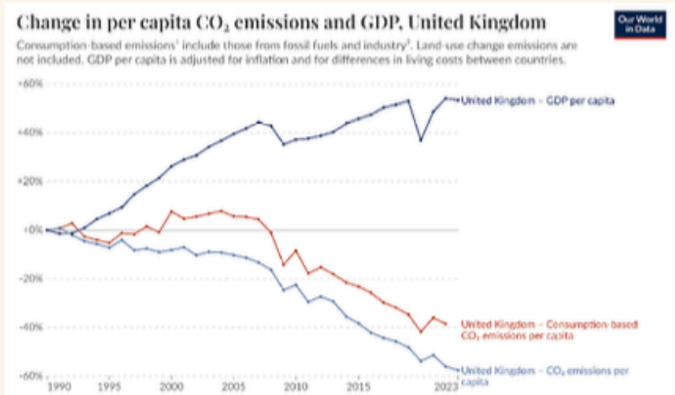


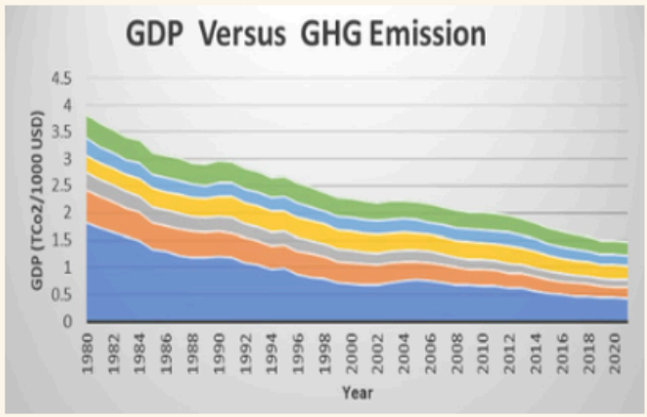
figure 1. Change in per capita CO2 emissions and GDP, United Kingdom

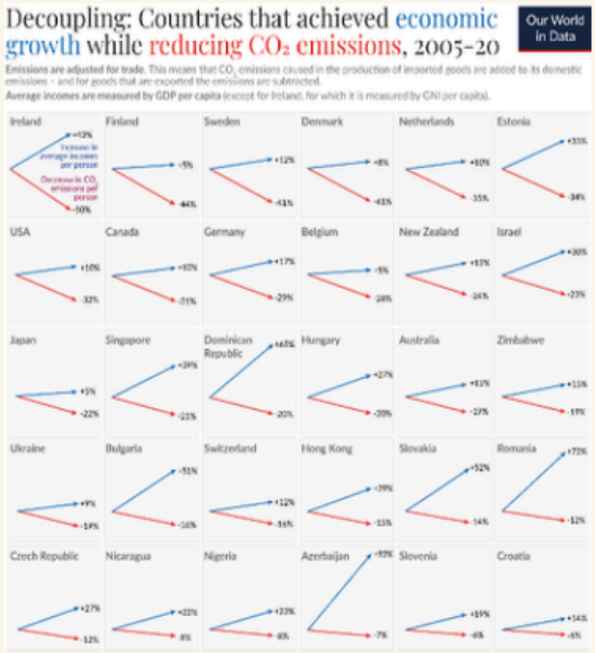
ecoupling

Electrification: Electrification is expected to account for 70% of total energy consumption by 2030, moderating overall energy demand (IRENA, 2023).
Renewables Expansion: The share of renewables is projected to rise from 15% in 2022 to over 30% by 2030 (IRENA, 2023), driven by falling costs and accelerated adoption.
Our World in Data highlights that while several advanced economies have already decoupled, emerging economies still face the dual challenge of sustaining economic growth while reducing emissions. Bridging this gap will require not only technological diffusion but also ambitious policies.

Conclusion

The emerging decoupling of CO2 emissions from economic growth represents a fundamental shift in the global energy landscape. While advanced economies demonstrate that emissions reductions and growth are not mutually exclusive, countries like China and India still face structural hurdles. Continued innovation, investment in renewables, and region-specific policy interventions will be crucial to achieving global decoupling and building a resilient, sustainable future.





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The Billion-Dollar How GLP-1 Drugs Are Redefining

By: Justin Plank

Every year, the United States spends an estimated $173 billion treating obesity-related diseases like diabetes and heart disease, more than the annual budgets of 42 U.S. states combined. Amid this crisis, GLP-1 receptor agonists have emerged as a potential game-changer, offering not only weight loss but also the possibility of reducing obesity-related healthcare costs. Once a niche treatment primarily for diabetes, drugs like Ozempic and Wegovy have surged in popularity, fueled by

celebrity endorsements and rising demand among high-income consumers. GLP-1 medications mimic naturally occurring hormones that regulate blood sugar and appetite, making them revolutionary for both diabetes management and weight loss. However, these medications can see prices as high as $1300, raising economical and ethical concerns. It is essential to explore the economic implications of GLP-1 drugs, analyzing their production costs, accessibility disparities, and broader financial impact on healthcare and society.

History of GLP-1's

The foundation for GLP-1-based therapies was laid in 1986 when Joel Habener and Svetlana Mojsov identified GLP-1 as a hormone released from the intestine that triggered insulin secretion in response to glucose (Friedman 2024). This discovery was groundbreaking because it addressed a major drawback of existing diabetes treatments, uncontrolled insulin release, which often led to dangerously low blood sugar. Pharmaceutical giants quickly mobilized research teams to explore GLP-1's potential, setting the stage for a revolution in weight loss medicine.

Novo Nordisk led the charge, developing liraglutide (Victoza) in 1996. After a 14-year approval process, Victoza became the first GLP-1 drug for type 2 diabetes in 2010. The introduction of semaglutide (Ozempic) in 2017 marked a major breakthrough, offering once-weekly dosing that improved patient adherence. In 2021, the FDA's approval of Wegovy signified a turning point, expanding GLP-1 therapy from diabetes management to a powerful tool against obesity. With the power to tackle both diabetes and obesity, GLP-1 therapies are reshaping public health strategies and redefining the future of chronic disease management.

The Current Landscape of GLP-1's

Today, GLP-1 receptor agonists have evolved into a multi-billion-dollar industry, with demand outpacing initial projections. Novo Nordisk and Eli Lilly now dominate the market, with their drugs Ozempic, Wegovy, Mounjaro, and Zepbound driving projected sales to $100 billion by 2030 (Buntz, 2024). Yet, with rapid expansion comes an array of economic and logistical hurdles. As these drugs reshape healthcare, questions surrounding affordability, accessibility, and long-term economic impact become impossible to ignore.

Understanding the High Costs of GLP-1 Therapies

Shortages

The high cost of GLP-1's is driven by the overwhelmingly high demand for GLP-1's which has triggered supply shortages. Between 2018 and 2023, prescriptions for GLP-1's increased by 300%. (Innovative 2024). The demand surge far exceeded pharmaceutical companies' initial forecasts, creating an imbalance between supply and patient needs. Due to the sophisticated and expensive manufacturing process of GLP-1's, companies struggled to increase production

Cure?
g Health, Wealth, and Access

in response to high demand. Even when manufacturers increase production, regulatory approvals and insurance hurdles slow distribution. Furthermore, shortages force rationing, leaving many patients, especially in lower-income areas, unable to access these treatments.

Production Costs

The complexity of GLP-1 drugs results in significantly higher production costs compared to traditional small-molecule drugs like aspirin. Pharmaceutical development is notoriously expensive, with research and development, clinical trials, regulatory approvals, and patent protections all contributing to the financial burden. On average, developing a new drug costs approximately $3 billion, takes around 15 years, and has a high failure rate (Theron 2025). Since many drug candidates fail in clinical trials due to safety or efficacy concerns, pharmaceutical companies must recoup these sunk costs by setting high prices on the successful drugs that do reach the market.

Patent Exclusivity

Furthermore, manufacturers operate within a limited profit window due to patent exclusivity, which typically lasts 12 to 14 years before generic competition emerges (Kesselheim, 2017). Once exclusivity expires, competing pharmaceutical firms can produce cheaper, generic versions, leading to a significant drop in prices. Patent exclusivity for Novo Nordisk's semaglutide (Ozempic, Wegovy) extends until at least 2032 in the U.S., delaying the entry of lower-cost generics (Novo's Ozempic Seen, 2024) However, until that point, firms aggressively price these drugs to maximize returns, particularly in the U.S., where weaker price regulation allows for significantly higher costs.

Insurance Barriers and the Two-Tiered Healthcare Divide

Insurance Coverage and Its Impact

Insurance coverage for GLP-1 receptor agonists varies significantly, largely depending on their FDA-approved indication. Medications like Ozempic and Mounjaro, approved for type 2 diabetes, are typically covered by insurance, while weight-loss-specific drugs such as Wegovy and Zepbound frequently face coverage denials, leaving many patients without reimbursement options. Even when covered by private insurance, out-of-pocket costs can exceed $500 per month, making GLP-1s financially out of reach for many patients. Co-pays, deductibles, and step therapy requirements further restrict access. In response to affordability concerns, Eli Lilly recently lowered the out-of-pocket price of Wegovy to $499 per month for uninsured patients paying in cash (Robbins 2025). While this price cut appears significant, it does little to help insured patients with high cost-sharing or those reliant on government insurance programs like Medicaid and Medicare. For Medicaid recipients, states independently determine coverage for obesity treatments, leading to vast disparities. As of August 2024, only 13 state Medicaid programs cover GLP-1s for obesity treatment, while 37 states have opted out due to cost concerns (Essel 2024). The financial strain on government programs is evident as West Virginia's Medicaid pilot program for weight-loss drugs was suspended after costs ballooned to $1.4 million per month, despite the state having a 40%

obesity rate (Strassman 2024). Unlike Medicaid, Medicare follows a federal standard, meaning its policies apply nationwide. While Medicare covers drugs used for diabetes treatment, it excludes weight-loss drugs due to these outdated policies. As a result, over 50 million Medicare beneficiaries lack access to GLP-1's for weight loss. While financial and policy barriers limit access to GLP-1 drugs, these challenges disproportionately affect marginalized communities, particularly racial and ethnic minorities, who already face systemic healthcare inequities.

In theory, patient assistance programs (PAPs) offer a lifeline, providing discounts, free medication vouchers, and financial support. However, strict eligibility requirements exclude many uninsured and underinsured individuals, leaving affordability challenges largely unaddressed. The resulting financial disparities disproportionately affect marginalized communities, particularly racial and ethnic minorities, who already face systemic healthcare inequities.

Emergence of a Two-Tier System

The high cost of GLP-1s has led to a stark two-tier system: wealthier patients can afford consistent treatment, while lower-income individuals, who often have higher rates of obesity and diabetes, struggle to access these medications. This disparity is particularly pronounced in marginalized communities. Insurance coverage plays a major role in these inequities. Black and Hispanic Americans face higher uninsured rates than their white counterparts, worsening systemic inequities in access to GLP-1 medications (Artiga et al., 2024). Additionally, Blacks and Hispanics are more likely to work in jobs that do not offer employer-sponsored insurance, forcing them to rely on high-deductible individual plans with significant out-of-pocket costs.

Beyond financial barriers, racial disparities in provider access and prescribing patterns further limit treatment options. Studies show that Black patients are 19% less likely to be prescribed GLP-1 drugs than white patients, and Latino patients are 9% less likely, even when they meet clinical criteria. (Kaplan 2024). These disparities in access and prescribing not only reinforce existing health inequities but also exacerbate the long-term economic and medical burdens of obesity in marginalized communities. As GLP-1 drugs remain out of reach for many who need them most, the broader costs of obesity, both for individuals and the healthcare system, continue to rise. Understanding these financial and societal impacts is crucial to addressing the full scope of the obesity epidemic.

Long-Term Effects on Public Health and the Economy

Obesity and Healthcare Costs

Obesity imposes a substantial financial burden on the U.S. healthcare system, with estimates suggesting that obesity-related healthcare expenses account for more than 12% of the $33 trillion in total spending on major health programs (States 2024). These expenses include both direct costs, such as hospitalization, medications, and chronic disease treatments, as well as indirect costs, including lost productivity, absenteeism, and lower lifetime earnings due to obesity-related mortality. Obese individuals require more frequent medical care due to increased rates of type 2 diabetes, cardiovascular disease, and obesity-related cancers, leading to $147 billion in annual medical costs (Cawley 2021). Medicaid and Medicare disproportionately bear this burden, contributing to rising taxpayer-funded healthcare expenditures. Because insurers do not adjust premiums for obesity, non-obese individuals must incur the higher medical costs of obese individuals in shared insurance pools. This results in an estimated $150 per capita welfare cost, disproportionately affecting women and the elderly (Hammond and Levine 2022). Obesity is not just a medical concern, it is also a major economic issue affecting workplace efficiency. Obese employees take an average of 3.73 more sick days per year than non-obese employees. In addition, Obese workers are 194% more likely to take paid time off, resulting in $11.7 billion in lost productive time annually (Hammond and Levine 2022). Obesity-related disabilities and premature mortality reduce overall workforce participation, further diminishing economic output.

By 2030, more than 50% of U.S. adults are projected to be obese (Healy 2019), pushing total economic costs to nearly $350 billion, up from $215 billion in 2010 (Hammond and Levine 2022). If GLP-1 therapies become more accessible, they could help curb this trend by reducing obesity related comorbidities, decreasing long-term healthcare expenditures and improving employee health. However, the true impact of GLP-1 accessibility extends beyond just healthcare savings, it has the potential to reshape economic structures by influencing insurance models, workforce productivity,

and long-term financial planning. As these drugs gain prominence, they are not just shaping the future of preventative medicine, they are forcing a critical reckoning in healthcare economics.

The Economic Case for GLP-1's

The rise of GLP-1 receptor agonists represents a defining moment in the intersection of medicine and economics. At a time when obesity is not just a public health crisis but a profound economic burden, these drugs offer a glimpse into a future where preventative medicine could reshape entire markets. They hold the potential to reduce healthcare expenditures, redefine life insurance models, and enhance workforce productivity, all of which have far-reaching consequences for economic stability.

Yet, their promise is undermined by a fundamental challenge: accessibility. Without broader affordability, these drugs risk amplifying health disparities rather than alleviating them. High prices, insurance barriers, and systemic inequities threaten to confine their benefits to those who can afford them, leaving behind the populations most affected by obesity. Unlocking GLP-1's full potential requires bold policy reforms, insurance adjustments, and pricing strategies that balance innovation with accessibility. The choices made today won't just define the future of obesity treatment, they will shape economic and public health outcomes for generations.

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Interview with Dr. Katy Milkman

By: Aaron Mathew

Dr. Katy Milkman

Overview

Dr. Katy Milkman is the James G. Dinan Professor at The Wharton School of the University of Pennsylvania and the co-director of the Behavioral Change for Good Initiative alongside Dr. Angela Duckworth. Her research interests span behavioral economics, psychology, and research methodology, which she explores in her NYT Best-Selling book "How to Change: The Science of Getting from Where You Are to Where You Want to Be".
Dr. Milkman also hosts Choiceology, a leading behavioral science podcast with Charles Schwab. I had the pleasure of speaking with Dr. Milkman on January 18th, 2024, about her origins with BCFG and the everyday importance of behavioral economics.

Interview: 1/18/2024

Aaron Mathew: Good afternoon. Thank you so much for taking the time to talk with me, I know you have a really busy schedule so I really appreciate it.

Katy Milkman: Oh yeah, I'm happy to do it.

AM: I want to talk to you today about two key evolutions, let's call it: The evolution of your work, the kind of questions that you're asking, and then a big picture cultural evolution that's been happening while you've been doing that work. And that's pretty closely intertwined, you're researching behavior, but I want to really talk about how your work is responsive to changes in society, in the big picture. How does that sound?

KM: Sure, I hope I can answer. We're just doing our best, I don't know! Not that responsive, probably, but we're trying!

AM: Of course, of course. Okay, let's start way, way, way back at the beginning. How did you become first interested in behavior change?

KM: Oh, gosh. It's a good question. There are so many different ways I can answer that question. I think [at] first it was just as a person who's introspecting, right? And I think that's how everybody who's interested in behavioral science or behavior change starts at the very beginning. It's just like, "I've been noticing weird things that I do, that people I care about do", and trying to make sense of the world. So that's certainly the very beginning of it, is just being a human observer of the human condition, so you can call it me-search. But then I guess I would say more intensively, or the more academic answer, is that when I was an assistant professor here at Wharton, I wasn't necessarily focused exclusively on behavior change, I would have said my identity was like, "I'm interested in decision making and all the weird things people do and all the mistakes they make, which is a pretty broad area." And then, we have a med school here and I wandered over to med school, and ended up in a seminar room where someone was presenting this graph showing the proportion of premature deaths in the US that are due to different causes. So it was a nice pie chart breaking that down, it had things like accidents and environmental exposure and genetics, and it also had daily decisions on that graph. And the thing that really blew my mind and ended up being a pretty pivotal moment was seeing that that wedge about daily decisions was about 40% of premature deaths.

It was bigger than any other contributor, and that really surprised me. And so I saw an opportunity to do something more impactful than I had appreciated with a focus I would have guessed like five percent... So the accumulation was bigger than I thought, and that helped me refocus and realize, "Okay, dabbling, studying decision making is one approach, but here's a real opportunity for impact." So that got me focused on behavior change, not just in health but also other consequential domains, like savings and education, where you can sort of imagine similar graphs. Maybe you haven't literally seen them, but probably things accumulate more than I could appreciate it, which was the main takeaway I had from seeing that. So that's what got me really hooked.

AM: Wow, 40% is a pretty staggering number. I don't know if I would have pitched it at 40% just thinking about it.

KM: No, and I think it's even higher today if you look at estimates because of the opioid crisis. And traffic fatalities have been going up as well because of texting and driving. That graph was from 2007, so I think the latest estimates are actually considerably higher, which is pretty extraordinary.

AM: Obviously, you've done a lot of really impactful work with the behavioral change for good initiative, and I was just wondering if you could give a little insight into the niche or the need you were looking to fill when you started that up with Dr. Duckworth.

KM: Yeah, sure. So that initiative actually was a response to a call for proposals that came out from the MacArthur Foundation, of all places, in 2016, basically saying "We're gonna give $100 million to one team that can make meaningful progress on an important social goal. Tell us your best idea." And there was an internal competition at the University of Pennsylvania and along with Angela – I like that you called her Dr. Duckworth – I was already really interested in behavior change, we were talking about it regularly, thinking about how we could work together, because we were both interested coming from different backgrounds and angles. And we were like, "Hey, what could be a more important problem than this, honestly? This is totally worth $100 million if you can come up with an innovative new approach to trying to make more meaningful inroads on these important problems". So that's really where it came from, was this external impetus, and we entered the competition

We actually did okay, I think we made it to the semi-finalist round. We did not ultimately get 100 million dollars. It went to Sesame Street to make programming for refugee children. And ultimately, actually, amazingly, they came to Angela and I like, "But we can't figure out how to change their behavior!", and we had a good laugh about that, but I love Sesame Street and I love Big Bird so no hard feelings. But it gave us our start and we got some seed funding from the University after they had sort of put us up as the one proposal through an internal competition. And the idea was sort of like, "Okay well, if we want to imagine we had $100 million to spend on making progress on this important issue, how would we optimally structure it?" Basically money is not a constraint under those conditions, what do we do? And we were like, "Well, let's bring together all the brightest minds from different disciplines, have them collaborate, try to design, tournament style, different programs with different scientific insights built in and compete to see what works best". Let's partner with big organizations so we can run massive experiments and test things simultaneously and see what wins, and that's really basically where the whole thing was born.

AM: What's really interesting is what you just mentioned at the end there: running massive experiments at the same time. That leads into one of the biggest things that you guys have done at the behavioral change initiative, which is all your work with mega studies.

KM: That completely came out of this call, and then once we sort of dreamed that up, we were like, "Oh, we should definitely do this". So we did it anyway, even without $100 million.

AM: Obviously now, it makes so much sense that money was a part of the origin for how you started this work, because your work with mega studies, it's really done a lot to make behavioral change research more cost effective in the long term. And really, when I looked into your background with mega studies, what really fascinated me is how it really serves as a study about studies. It really changes the way we look at how we can conduct behavioral change research. Can you talk a little bit about why mega studies are so promising and when it makes behavioral change research more effective?

KM: Yeah, I mean we're very excited about their potential. I also, by the way, think they have plenty of limits, and I'm glad that we still do work other ways too.

The potential is, instead of throwing one thing at the wall and having it stick or not, we would like many things to be tested simultaneously, and we get comparable evaluation statistics about how impactful they are. We can also look at heterogeneity, so like what works best for whom, much more effectively when we test twenty things than when we test one at a time, and we can really start to hone in on, "Oh, for these subpopulations there's real value in this approach. These other subpopulations really respond better to something else". Coinciding with machine learning taking off, it's nice to have data that allows you to look at those kinds of questions. Let's see, I've loved the cross pollination, because normally everybody's pretty siloed: economists publish in econ journals, psychologists [in] psych journals, marketing people in marketing journals, medical doctors [in] medical journals, and they don't have as many reasons to rub elbows. In the mega study framework, each of those groups can still design their self-contained research study, but then they get pooled and glued together inside of a mega study, and they end up getting to see what other people are up to in different fields and co-authoring the ultimate megastudy paper, even though their own study gets to be its own research paper in their preferred journal. And so I think that's been really nice too, just for breaking down some barriers, getting people to learn from each other who might otherwise not have known that there was a conversation to join. And the fixed costs are borne by a single organizer, so we can reduce the marginal costs for individual scientists with a cool idea who don't have the wherewithal to set up a field site to test something policy relevant, so that's been great too.

AM: Okay, skipping to the end here, I just want to ask you about Choiceology. How important is it that the everyday person knows about and understands behavioral economics?

KM: That's a great question. How important, that's a hard question to answer. I think there's a lot of value in it, because so many of our decisions can be optimized or better if we understand decision biases. We can make better choices about our finances, our health, our education, our parenting, our job choice, our mortgages, if we get the science right. So the hope is just to bring a wider set of people the knowledge that means they're not making mistakes that are costly. So it's hard to quantify what that's worth, but I think it's worth a lot, and that's why I do it.

AM: Thank you so much for your time, and I'd love to continue this conversation going forward.

KM: Thank you.

Behavioral Scientist, Wharton Professor, and Co-Director of the Behavior Change for Good Initiative

Engel Curves and Their Implications for Income, Nutrition, and Poverty Measurement

By: Shloka Mohanty

Engel curves illustrate how the consumption of goods changes as income increases. A classic example from ECON 301 is instant ramen noodles: as income rises, the consumption of this staple typically declines, classifying it as an inferior good. However, this relationship can vary by country.

In India, instant ramen is often perceived as a premium product and is typically found in high-end grocery stores. While many people might think of Maggi when discussing this topic, it's important to note that Maggi is not an instant ramen brand. Instead, it is an instant noodle brand many Indians grew up with. Maggi is inexpensive, widely available, and locally manufactured. It has become an integral part of Indian food culture, much like tea.

On the other hand, instant ramen usually refers to imported East Asian noodles, such as Shin Ramyun, Samyang, and Nongshim. These brands offer more complex flavors, exotic branding, and higher prices. Often marketed as premium, spicy, and international, they are considered luxury goods.

This raises an interesting question: can Engel curves be used to measure a country's income level? Additionally, do they provide insights into nutrition?

Understanding Engel Curves

Engel curves illustrate a consumer's expansion path at fixed prices, showing how the quantity of goods consumed changes with income. Normal goods can be categorized into two types: normal necessity goods and luxury goods. The income elasticity of demand for normal necessity goods ranges from 0 to 1, indicating that consumption increases as income rises. In contrast, luxury goods have an income elasticity of demand greater than 1. On the other hand, inferior goods exhibit negative income elasticity, meaning that demand decreases as income increases.

Income significantly influences food choices and impacts nutrition. According to Bennett's Law (1941), as incomes rise, diets tend to shift from reliance on starchy staples to a more diverse array of food groups (Clements & Si, 2018). In the United States, wealthier individuals often reside in neighborhoods with greater access to grocery stores that stock fresh produce, whole grains, and lean proteins, such as those found at Whole Foods. However, research by Kumar, T. Krishna, and

others suggests that in developing nations like India, as incomes increase, diets often shift toward processed foods. This trend is evident in reports from Euromonitor and Nielsen, which indicate that fast food chains like Domino's, McDonald's, and KFC, along with local snack brands, have experienced steady growth in sales in India. This increase has been largely driven by rising disposable incomes among the urban middle class. Consequently, being wealthier does not necessarily lead to healthier eating habits; in fact, it can result in the consumption of less healthy foods.

Income, Food Demand, and Nutrition

A study by Colen and others looked at how people's food spending changes as they earn more money. They found that basic foods like rice or wheat (called staples) don't see much of a spending increase as income rises—these foods are less responsive to income changes. But for luxury foods, spending increases more sharply with higher income.

In Africa, for example, data shows that as people earn more, they do spend more on food—but the rate of increase slows over time. On average, people increase their food spending by about 61 cents for every extra dollar earned, showing that food is a necessity, not a luxury.

In India, which reflects broader trends in many developing countries, similar patterns are seen. Spending on staple foods tends to level off as incomes rise (flattening Engel curves), while spending on luxury foods, which in this case would be more processed foods, increases (producing steeper Engel curves). This reflects a nutrition transition, where wealthier households shift away from traditional diets and toward foods higher in fat, sugar, and additives.

Overall, income affects not just how much people spend on food but also what kinds of food they choose, leading to shifts in both diet quantity and quality, though the exact patterns can differ between countries.

Engel Curves as a Tool for Measuring Poverty

Engel curves provide an alternative perspective on poverty measurement that focuses on consumption rather than income. Kumar, Holla, and Guha introduce a consumption-based method known as the Food Deprivation Index. This index measures food spending shortfalls in relation to the saturation points of Engel curves, which serve as benchmarks for adequate food consumption. When households spend below these saturation points, it indicates food deprivation, regardless of their income level.

An analysis of data from India's National Sample Survey Organization (NSSO) reveals that many households spend less on food than the amounts suggested by the Engel curves as being adequate, thus highlighting the issue of food deprivation. Traditional income-based poverty measures often fail to capture this reality, as many households classified as "above the poverty line" still struggle with food insecurity. Additionally, the gap in food deprivation between rural and urban areas has widened since economic reforms, with urban communities benefiting more significantly from economic growth compared to their rural counterparts. This approach goes beyond fixed poverty lines by utilizing Engel curves, offering a more nuanced understanding of deprivation. It recognizes that poverty is not solely about income, but also about access to essential goods.

Engel Curves and Cross-Country Comparisons

Engel curves reveal clear global contrasts in food expenditure patterns. In developing nations, where per capita income is typically below $5,000, households spend a large portion of their budget on food—often over 40%—making food a dominant daily expense. In contrast, in high-income countries (with per capita incomes above $10,000), while people spend more money on food in absolute terms, it accounts for a much smaller share of their overall budget, often under 15% (Roser, 2022).

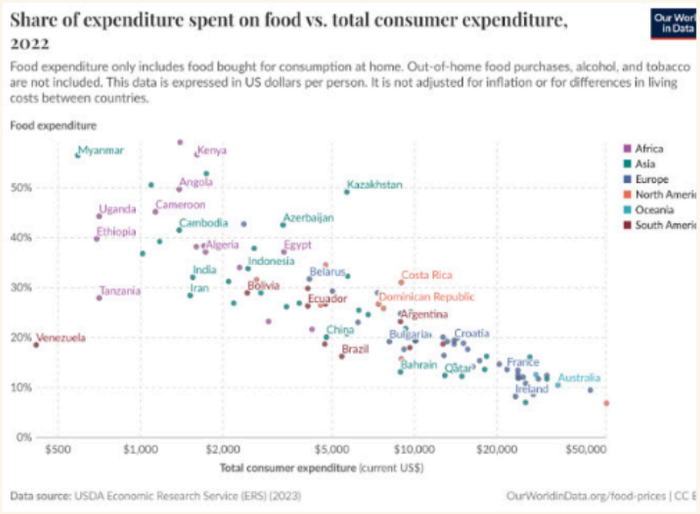
As incomes rise, especially in wealthier nations, spending gradually shifts away from food toward sectors like education, healthcare, housing, and leisure—reflecting broader changes in lifestyle and financial priorities. Meanwhile, diets also tend to diversify, incorporating more luxury items such as meat, dairy, imported goods, and processed foods. This contrasts with lower-income populations, where diets remain heavily reliant on starchy staples due to cost constraints.

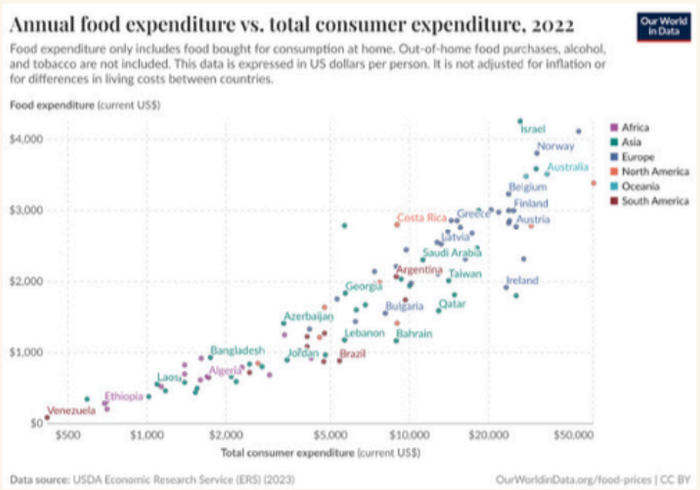
Policy Implications

Engel curves provide valuable insights for food security and nutrition policy, particularly when viewed through the lens of national income levels. In low-income countries, where household incomes are limited, a large share of earnings goes toward food, making these populations highly vulnerable to food price volatility. This highlights the importance of price stability and affordable staples in maintaining food security.

As countries move into middle-income status, rising incomes trigger a dietary transition—households begin to consume more processed and convenience foods, which often lack nutritional value. This shift calls for public health policies that promote nutrition education, food labeling, and regulation of unhealthy food marketing to mitigate the rise in diet-related diseases.

Additionally, Engel curves help refine poverty measurement. Instead of relying solely on static income thresholds, they account for actual spending behavior—revealing that even in middle-income countries, households above the poverty line may still experience food deprivation if their consumption falls below expected levels. This makes Engel curves a powerful tool for designing targeted interventions based on both income and consumption patterns.





"Engel curves offer a more nuanced understanding of poverty—revealing that income alone doesn't guarantee adequate food consumption."

Conclusion

Engel curves provide valuable insights into economic behavior, from food consumption patterns to poverty measurement. Beyond income elasticity, they reveal how rising incomes shape diet quality and spending priorities. As global incomes grow, Engel curves will continue to guide policies ensuring food security, nutrition, and equitable economic development.

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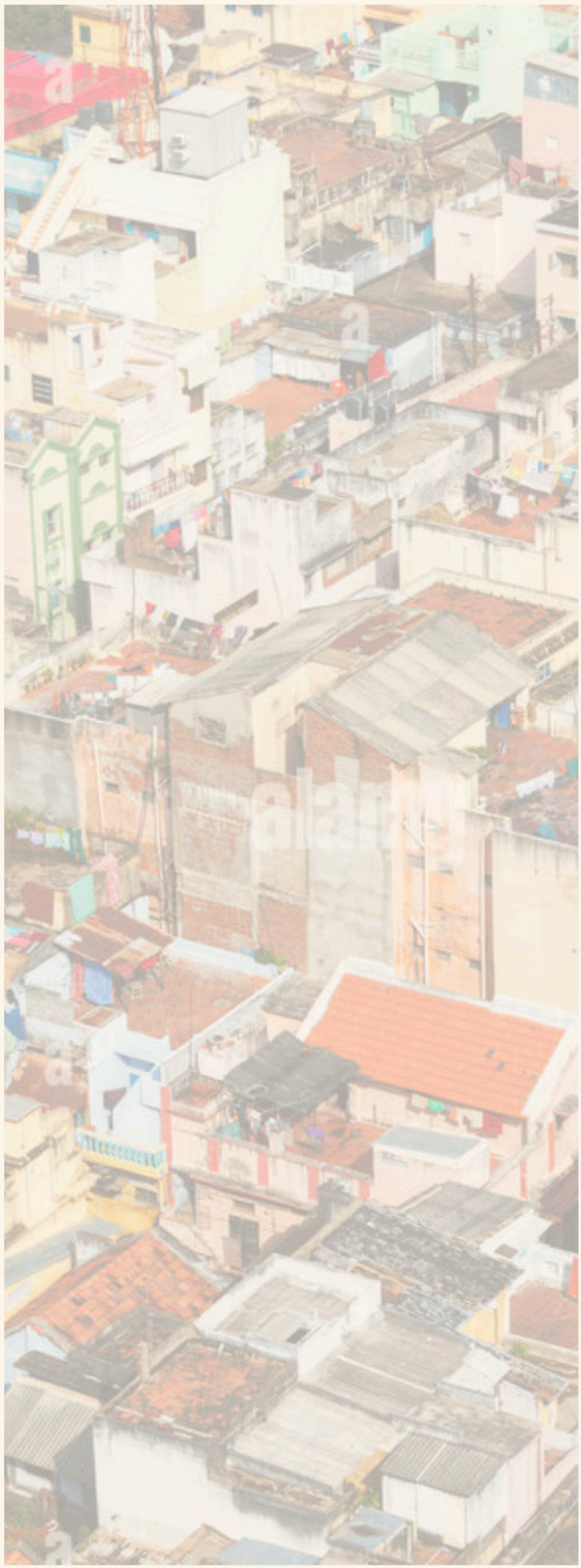

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