

PRINCIPLES OF POLITICAL ECONOMY AND THE TAXATION OF NATIONS: ECONOMETRIC AND MACHINE-LEARNING EVALUATION OF TARIFFS*

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2020 MICH. ST. L. REV. 1361

ABSTRACT

Demography affects the ability of countries to manage their debt levels and to make macroeconomic policy. By the same token, the demographic attributes of labor influence political decisions among nations, including international trade policy. In particular, the free movement of labor is a bedrock principle of the European Union. That legal guarantee has prompted one country to leave the Union, even as it inspires other countries to join.

This Article investigates the influence of (labor) demographics on tariffs in forty-five OECD and non-OECD countries. A series of

* The title alludes to four works of classical economics written in the eighteenth and nineteenth centuries: Adam Smith, *The Wealth of Nations*; David Ricardo, *Principles of Political Economy and Taxation*; Thomas Malthus, *Principles of Political Economy*; and John Stuart Mill, *Principles of Political Economy and Some of Their Applications to Social Philosophy*. This Article is adapted from chapter 3, *The Impact of Demographics on the Level of Tariffs*, in GEORGE GALANOS, CHARALAMPOS AGIROPOULOS & THOMAS POUFINAS, *DEBT IN TIMES OF CRISIS: DOES ECONOMIC CRISIS REALLY IMPACT DEBT?* (2021). It demonstrates many of the machine-learning methods described in James Ming Chen, *An Introduction to Machine Learning for Panel Data*, 27 INT'L ADVANCES IN ECON. RSCH. 1 (2021) [hereinafter *Introduction to Machine Learning*] and James Ming Chen, *Split Decisions: Practical Machine Learning for Empirical Legal Scholarship*, 2020 MICH. ST. L. REV. 1301 (2020) [hereinafter *Split Decisions*].

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econometric models reveals evidence that the population and labor force may influence tariff levels. By contrast, migration does not. Income per capita and consumption affect tariff rates. Machine-learning methods confirm conclusions reached through conventional econometrics and shed further light on the relationship between tariff levels and their hypothesized predictors. The absence of a significant relationship between tariffs and migration undermines the common political assumption that tariff and immigration policy are mutually reinforcing levers of international policy.

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INTRODUCTION

Tariffs are customs duties on imports. They give domestic goods a competitive advantage over similar imported goods. In addition to supplying government revenue, tariffs provide policy levers that can adjust the level of imports and exports between countries.¹ They can be used to implement a trade policy that taxes foreign goods and privileges domestic production.

High tariffs and policies based upon them often come at the expense of domestic consumers. Consumer prices rise, either directly from tariffs themselves, or indirectly as imports yield market share to domestic substitutes that would not have been produced under a lower or even nonexistent tariff. Distortions resulting from tariffs may radiate throughout the entire economy.²

Because tariffs protect local production and spur domestic output in place of imports, tariffs can reduce a country's trade deficit. Whether tariffs can reduce government debt stirs great controversy.³ In previous work on this subject, several of us have acknowledged the relationship between tariffs and debt.⁴

Demographic changes can also affect the debt of a country. Shifts in the size and age distribution of a country's population can influence the labor force, the outsourcing of manufacturing to certain countries, wages, membership in trade unions, inflation, and interest

1. See *Tariffs*, WORLD TRADE ORG., https://www.wto.org/english/tratop_e/tariffs_e/tariffs_e.htm [<https://perma.cc/KJV6-3FHT>] (last visited Apr. 5, 2021).

2. See Trent J. Bertrand & Jaroslav Vanek, *The Theory of Tariffs, Taxes, and Subsidies: Some Aspects of the Second Best*, 61 AM. ECON. REV. 925, 927–29 (1971); Murray C. Kemp & Takashi Nagishi, *Domestic Distortions, Tariffs, and the Theory of Optimum Subsidy*, 77 J. POL. ECON. 1011, 1011 (1969). See generally Jagdish Bhagwati, V.K. Ramaswani & T.N. Srinivasan, *Domestic Distortions, Tariffs, and the Theory of Optimum Subsidy: Some Further Results*, 77 J. POL. ECON. 1005 (1969); R. G. Lipsey & Kelvin Lancaster, *The General Theory of Second Best*, 24 REV. ECON. STUD. 11 (1956); Otto A. Davis & Andrew B. Whinston, *Welfare Economics and the Theory of Second Best*, 32 REV. ECON. STUD. 1 (1965); Richard G. Lipsey, *Reflections on the General Theory of Second Best at Its Golden Jubilee*, 14 INT'L TAX & PUB. FIN. 349 (2007).

3. See William Alan Reinsch, Andrew Chatzky & Jonathan Robison, *Can We Really Pay Down the National Debt with Tariffs?*, CTR. FOR STRATEGIC & INT'L STUD. (Apr. 10, 2018), <https://www.csis.org/analysis/can-we-really-pay-down-national-debt-tariffs> [<https://perma.cc/9VVK-9E3V>].

4. See GALANOS, AGIROPOULOS & POUFINAS, *supra* note *.

rates.⁵ By the same token, demographic factors affect the explicit and implicit tax flows that enable a government to service its debt obligations.⁶

Tariff policy cannot escape the economic and political pressures exerted by demographic change. In setting tariffs, governments must account for the movement of labor as well as trade in goods and services. The European Union (EU), for example, guarantees the free movement of labor.⁷ This commitment can be seen as an incentive to enter or exit the EU. For every Brexit-style referendum that shrinks the EU, several accession votes could expand the Union, especially along its eastern frontier. The EU also favors zero tariffs; in 2018, almost 70% of the imports in the EU bore zero tariffs.⁸

The year 2016 also marked the election of Donald Trump as President of the United States. The Trump campaign promised vigorous opposition to immigration and to trade liberalization. In his inaugural address, President Trump explicitly condemned both phenomena as root causes of “American carnage.”⁹

Blaming immigrants and imports for job losses (especially among lower-income, less educated workers) is an ancient theme in American law and politics.¹⁰ The virulently nativist Know-Nothing movement flourished before the Civil War.¹¹ In 1892, the Supreme Court acknowledged Congress’s efforts to stem the flow of “cheap, unskilled labor” from “the lowest social stratum” whose “inevitable

5. See Charles Goodhart & Manoj Pradhan, *Demographics Will Reverse Three Multi-Decade Global Trends* 1–2 (Banking for Int’l Settlements, Working Paper No. 656, 2017).

6. See Christian Hagist, Stefan Moog, Bernd Raffelhüschen & Johannes Vatter, *Public Debt and Demography: An International Comparison Using Generational Accounting*, 7 CESIFO DICE REP. 29, 34 (2009).

7. See 2012 O.J. (C 326) 65–73.

8. See *International Trade in Goods – Tariffs*, EUROSTAT, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_in_goods_-_tariffs#The_EU.E2.80.99s_common_trade_policy_and_tariffs [<https://perma.cc/2J3D-GPDX>] (July 9, 2020, 1:26 PM).

9. See generally Louis Kontos, *American Carnage: Political Culture in the Age of Trump*, 32 SOCIALISM & DEMOCRACY 1 (2018); John Peterson, *Present at the Destruction? The Liberal Order in the Trump Era*, 53 INT’L SPECTATOR: ITALIAN J. INT’L AFFS. 28 (2018).

10. See generally RICHARD HOFSTADTER, *ANTI-INTELLECTUALISM IN AMERICAN LIFE* (Vintage Books 1963); RICHARD HOFSTADTER, *THE PARANOID STYLE IN AMERICAN POLITICS* (Vintage Books 1st ed. 2008) (1965).

11. See generally TYLER ANBINDER, *NATIVISM AND SLAVERY: THE NORTHERN KNOW NOTHINGS AND THE POLITICS OF THE 1850s* (Oxford Univ. Press 1992); JEAN H. BAKER, *AMBIVALENT AMERICANS: THE KNOW-NOTHING PARTY IN MARYLAND* (John Hopkins Univ. Press 1977).

tendency” allegedly was “to degrade American labor, and to reduce it to the level of the imported pauper labor.”¹²

It is hardly coincidental that Brexit and Trump’s election both happened in 2016. Most observers assign Brexit and Trump’s election to a broader global surge in populist political sentiment against displacement of domestic industries and native-born workers’ jobs by imports, immigrant labor, and the outsourcing of manufacturing to lower-wage countries.¹³

The link between trade liberalization and labor market dynamics suggests that labor, especially in developing countries, may shift from industries that compete against imports to export industries.¹⁴ Wealthier countries systematically impose higher tariffs on inelastically demanded goods where domestic producers exert greater market power.¹⁵ This effect often takes hold before a country’s accession to the World Trade Organization (WTO), and may persist afterward with respect to trade restrictions not addressed by the WTO Treaty.¹⁶ Tariff policies at odds with global treaty obligations (or even aspirations) provide strong evidence that domestic producers with market power exert potent influence over noncooperative, anticompetitive stances in domestic politics.¹⁷

Moreover, trade openness and unemployment appear to be positively correlated in countries belonging to the Organisation for Economic Co-operation and Development (OECD) and negatively correlated in non-OECD countries.¹⁸ There is further evidence that trade openness affects the labor market.¹⁹ The effect of the reversal of

12. Holy Trinity Church v. United States, 143 U.S. 457, 464–65 (1892).

13. See, e.g., Paul J. Maher, Eric R. Igou & Wijnand A. P. van Tilburg, *Brexit, Trump, and the Polarizing Effect of Disillusionment*, 9 SOC. PSYCH. & PERSONALITY SCI. 205, 206–08 (2018); Graham K. Wilson, *Brexit, Trump, and the Special Relationship*, 19 BRIT. J. POL. & INT’L RELS. 543, 548 (2017).

14. See ALESSANDRO TURRINI, INTERNATIONAL TRADE AND LABOUR MARKET PERFORMANCE: MAJOR FINDINGS AND OPEN QUESTIONS 9 (2002).

15. See Christian Broda, Nuno Limão & David E. Weinstein, *Optimal Tariffs and Market Power: The Evidence*, 98 AM. ECON. REV. 2032, 2033 (2008).

16. See Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, 1867 U.N.T.S. 14; Multilateral Agreements on Trade in Goods, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 190.

17. See Broda, Limão & Weinstein, *supra* note 15, at 2064.

18. See TURRINI, *supra* note 14, at 4.

19. See WORLD TRADE ORG. (WTO), WORLD TRADE REPORT 5 (2017).

trade liberalization on employment has also been questioned.²⁰ These findings suggest that labor demographics may affect tariffs.

Migration could also affect tariff levels. The presence of a large number of immigrants in one country is often correlated with an increase in bilateral trade between the host and home countries of the migrants. Studies indicate that the impact of migration on trade in goods tends to slightly favor the host country. This negative impact on the trade balance of the home country can be offset by remittances, trade in services, and foreign direct investment.²¹

Tariffs can have an impact on debt.²² Through a series of econometric models and machine learning techniques, this Article examines whether demographic factors affect tariff levels. Some models and datasets suggest that population and the size of the labor force may affect tariff levels. These findings align with the literature and our own intuitions. Furthermore, income per capita and consumption evidently affect the tariff rate. We also clarify the relationship of tariff rates to imports, exports and the tax rate is also established. The link between tariff rates and demography can explain certain tariff policies.

On the other hand, there appears to be little empirical support for the hypothesized connection between tariffs and cross-border migration. Tariff and immigration policies, so often linked to one another in journalistic and even academic accounts of populist politics since two of the most salient political events of 2016—the election of Donald Trump as president of the United States and the passage of Great Britain’s referendum to leave the European Union—exhibit no statistically significant linkage.

I. LITERATURE REVIEW AND BACKGROUND

We begin by reviewing the theoretical literature on tariffs as sources of government revenue and tools for domestic and international policymaking. We then recite the law governing tariffs and trade barriers.

20. See Ekkehard Ernst, Rossana Merola & Daniel Samaan, *Trade Wars and Their Labour Market Effects*, at iii (Int’l Labour Off., Working Paper No. 48, 2019).

21. See *Migration and Trade*, MIGRATION DATA PORTAL, <https://migrationdataportal.org/themes/migration-and-trade> [<https://perma.cc/PBC9-MJWX>] (July 2, 2019).

22. See GALANOS, AGIROPOULOS & POUFINAS, *supra* note *.

A. Economic Theory: Tariffs as Revenue Sources and Regulatory Levers

The ability to tax lies at the very heart of political power, and fiscal evolution since the Middle Ages has given rise to the modern political state.²³ In 1918, at the dawn of modern macroeconomic science,²⁴ Joseph Alois Schumpeter declared, "Taxes not only helped to create the state. They helped to form it Tax bill in hand, the state penetrated the private economies and won increasing dominion over them."²⁵ Although Schumpeter did not provide a framework for evaluating the interactions that shape public revenue systems, he did identify three distinct types of influences: (1) economic, (2) political, and (3) administrative.

The lack of clarity in Schumpeter's boundaries between these categories may have arisen from his failure, at least as of 1918, to form an economic theory of political action. He published his essay on *The Crisis of the Tax State* in German (during that language's historical ebb in global respect and influence) and had little impact on the English-speaking scientific community.²⁶ As a result, other scholars did not begin engaging Schumpeter's analysis in earnest until the 1960s.

Harley Hinrichs linked stages of economic and fiscal development. He argued that the prime determinant of customs

23. See R. A. Musgrave, *Schumpeter's Crisis of the Tax State: An Essay in Fiscal Sociology*, 2 J. EVOLUTIONARY ECON. 89, 99 (1992); Karl-Heinz Schmidt, *Schumpeter and the Crisis of the Tax State*, in JOSEPH ALOIS SCHUMPETER: ENTREPRENEURSHIP, STYLE AND VISION 337, 338 (Jürgen G. Backhaus ed., 2003). See generally JOSEPH A. SCHUMPETER, *The Crisis of the Tax State*, in JOSEPH A. SCHUMPETER: THE ECONOMICS AND SOCIOLOGY OF CAPITALISM 99 (Richard Swedberg ed., 1991).

24. The end of the Great War and the Treaty of Versailles may be regarded as the dawn of the modern economic regime. JOHN MAYNARD KEYNES, *THE ECONOMIC CONSEQUENCES OF THE PEACE* (1920) documented the fatal missteps of the Paris Peace Conference and is considered the founding chronicle of the modern macroeconomic state. In the United States, the adoption of a federal income tax and the establishment of the Federal Reserve System were roughly contemporaneous with these global developments. They reinforce the decade of the 1910s as the birth of the modern economic regime.

25. SCHUMPETER, *supra* note 23, at 108.

26. Joseph A. Schumpeter, *Die Krise des Steuerstaats: Zeitfragen aus dem Gebiete der Soziologie*, in DIE FINANZKRISE DES STEUERSTAATS: BEITRÄGE ZUR POLITISCHEN ÖKONOMIE DER STAATSFINANZEN 329 (Rudolf Hickel ed., 1976).

revenue was a country's openness to trade.²⁷ Openness meant increased trade and therefore a rise in customs revenue if trade was being taxed at all. Hinrichs further found that openness to trade increased total government revenue, particularly in low-income countries drawing a large share of revenue from taxes on foreign trade.²⁸

Other scholars have also built upon Knut Wicksell's nineteenth century statement of principles of just taxation.²⁹ Richard Musgrave argued that the lack of "tax handles," or administratively simple ways of collecting revenue, might limit revenue collection at low levels of income.³⁰ He noted, however, that these limitations should ease as the economy develops. Most attempts to account for the share of tax revenue in GDP perform regression with proxies for possible tax handles.

Some further contributions were made in the 1970s and 1980s. James Kau and Paul Rubin highlighted the economic limits to fiscal development and the effects of changes in such limits on the growth of revenue systems.³¹ They also speculated whether collecting taxes in urban areas may be less costly. Walter Hettich and Stanley Winer similarly argued that "more efficient" taxation results in a larger government.³² Susan Hansen focused on the impact of political factors on the tax system.³³

Meanwhile, a separate literature examined tariffs as a specific source of revenue. Richard Caves and Gerald Helleiner independently analyzed Canadian tariffs as the product of political economy.³⁴

27. See Harley H. Hinrichs, *Determinants of Government Revenue Shares Among Less-Developed Countries*, 75 ECON. J. 546, 554 (1965).

28. See *id.*

29. See Knut Wicksell, *A New Principle of Just Taxation*, in CLASSICS IN THE THEORY OF PUBLIC FINANCE 72 (Richard A. Musgrave & Alan T. Peacock eds., 1967) (1958). This version of the essay represents J. M. Buchanan's translation of KNUT WICKSELL, *Ein neues Prinzip der gerechten Besteuerung*, in FINANZTHEORETISCHE UNTERSUCHUNGEN iv–vi, 76–87, 101–59 (1896).

30. See RICHARD A. MUSGRAVE, FISCAL SYSTEMS 86–87 (Yale Univ. Press 1969).

31. James B. Kau & Paul H. Rubin, *The Size of Government*, 37 PUB. CHOICE 261 (1981).

32. Walter Hettich & Stanley L. Winer, *Economic and Political Foundations of Tax Structure*, 78 AM. ECON. REV. 701 (1988).

33. SUSAN B. HANSEN, THE POLITICS OF TAXATION: REVENUE WITHOUT REPRESENTATION (1983).

34. Compare Richard E. Caves, *Economic Models of Political Choice: Canada's Tariff Structure*, 9 CANADIAN J. ECON. 278 (1976), with G.K. Helleiner, *The*

Focusing on Australia, John Conybeare extended a combination of the techniques that Caves and Helliener had employed in Canada.³⁵ Kym Anderson investigated why some Australian industries receive more government assistance than others.³⁶ Both Anderson and Conybeare used cross-sectional data and multiple regression in their attempts to explain the structure of Australian tariffs.

In 1989, Stephen Magee, William Brock, and Leslie Young synthesized economic theories seeking to explain the existence of protectionist trade policies into a comprehensive endogenous policy theory of tariffs.³⁷ Magee, Brock, and Young developed a complete general equilibrium theory that explains how well-organized groups manipulate government policies to exploit poorly organized rivals. “[R]edistributive policies such as protection” flourish, they argued, “because predatory parties and lobbies gain at the expense of uninformed and unorganized prey.”³⁸ According to the basic economics of international trade theory, however, tariffs are usually a relatively inefficient means of achieving policy objectives.³⁹

Magee, Brock, and Young specifically speculated that lobbying over tariffs would not damage welfare through high tariffs. They asserted that the political economy of trade would instead create a black hole threatening to engulf domestic productivity through the costs of bickering over tariffs and their levels. Since “industries partially run the government” within “a world of special-interest governments,” the making of trade policy “is better described as a fraternity house run by members.”⁴⁰ Later scholarship disagreed, finding strong evidence that market power combines with political influence to raise tariffs on imports competing against domestically produced but inelastically demanded goods.⁴¹

Political Economy of Canada's Tariff Structure: An Alternative Model, 10 CANADIAN J. ECON. 318 (1977).

35. John Conybeare, *Public Policy and the Australian Tariff Structure*, 3 AUSTRALIAN J. MGMT. 49 (1978).

36. Kym Anderson, *The Political Market for Government Assistance to Australian Manufacturing Industries*, 56 ECON. REC. 132 (1980).

37. See STEPHEN P. MAGEE, WILLIAM A. BROCK & LESLIE YOUNG, BLACK HOLE TARIFFS AND ENDOGENOUS POLICY THEORY: POLITICAL ECONOMY IN GENERAL EQUILIBRIUM 35–37 (1989).

38. *Id.* at 36.

39. See NEIL VOUSDEN, THE ECONOMICS OF TRADE PROTECTION 3–24 (1990).

40. MAGEE, BROCK & YOUNG, *supra* note 37, at 249.

41. See Broda, Limão & Weinstein, *supra* note 15, at 2032–33.

Additional contributions during the 1980s included Paul Krugman's model of learning-by-doing.⁴² Gene M. Grossman and Elhanan Helpman's endogenous growth models with research and development suggested that tariffs might raise national income, provided that the appropriate industry is chosen for protection.⁴³ The atavistic appeal of mercantilism remains dangerously alluring. "If patriotism is . . . the last refuge of the scoundrel, wrapping outdated industry in the mantle of national interest is the last refuge of the economically dispossessed."⁴⁴

By the 1990s, economists and legal scholars focused on the interaction between global trade and domestic economic conditions. For example, John Jackson, William Davey, and Alan Sykes argued that a reduction in world prices means that elasticity and domestic supply and demand must be considered in microeconomic analysis of the potential effects of tariffs.⁴⁵

The turn of the twentieth century witnessed a vigorous debate over the impact of tariffs on growth. Sebastian Edwards found a negative impact.⁴⁶ So did Dan Ben-David and the team of Michael Clemens and Jeffrey Williamson.⁴⁷ Other sources found a positive impact.⁴⁸ Most saliently among the skeptics of trade openness,

42. Paul Krugman, *The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher: Notes on Trade in the Presence of Dynamic Scale Economies*, 27 J. DEV. ECON. 41 (1987).

43. GENE M. GROSSMAN & ELHANAN HELPMAN, *INNOVATION AND GROWTH IN THE GLOBAL ECONOMY* (1991).

44. KEN'ICHI ŌHMAE, *THE END OF THE NATION STATE: THE RISE OF REGIONAL ECONOMIES* 62 (1995); accord Jim Chen, *The Vertical Dimension of Cooperative Competition Policy*, 48 ANTITRUST BULL. 1005, 1035–36 (2003).

45. JOHN H. JACKSON, WILLIAM J. DAVEY & ALAN O. SYKES, JR., *LEGAL PROBLEMS OF INTERNATIONAL ECONOMIC RELATIONS: CASES, MATERIALS AND TEXT ON THE NATIONAL AND INTERNATIONAL REGULATION OF TRANSNATIONAL ECONOMIC RELATIONS* (4th ed. 2002).

46. See Sebastian Edwards, *Trade Orientation, Distortions and Growth in Developing Countries*, 39 J. DEV. ECON. 31, 31 (1992); Sebastian Edwards, *Openness, Productivity and Growth: What Do We Really Know?*, 108 ECON. J. 383 (1998).

47. Compare Dan Ben-David, *Equalizing Exchange: Trade Liberalization and Income Convergence*, 108 Q.J. ECON. 653 (1993), with Michael A. Clemens & Jeffrey G. Williamson, *Why Did the Tariff–Growth Correlation Change After 1950?*, 9 J. ECON. GROWTH 5, 6 (2004).

48. See David N. DeJong & Marla Ripoll, *Tariffs and Growth: An Empirical Exploration of Contingent Relationships*, 88 REV. ECON. & STAT. 625, 626 (2006); Athanasios Vamvakidis, *How Robust Is the Growth–Openness Connection? Historical Evidence*, 7 J. ECON. GROWTH 57, 58 (2002); Halit Yanikkaya, *Trade Openness and Economic Growth: A Cross-Country Empirical Investigation*, 72 J. DEV. ECON. 57, 58 (2003).

Francisco Rodriguez and Dani Rodrik questioned the empirical methods of studies finding a positive relationship between openness and growth.⁴⁹ In an effort to reconcile these competing viewpoints, Jakob Madsen argued that growth is generally independent of trade openness, but that productivity correlates positively with openness once knowledge spillovers across national borders are recognized as a beneficial externality of interaction among trading partners.⁵⁰

The most recent contributions have analyzed the theoretical effects of introducing a tariff. According to Gregory Mankiw, a tariff decreases domestic consumption (by raising the price of imports), but increases domestic production (by raising the price that sellers can obtain).⁵¹ Tariffs therefore have three basic effects in the domestic economy: (1) they make consumers worse off; (2) they make producers better off; and (3) they raise revenue for the government. Despite the purely theoretical disadvantages of tariffs, Mankiw has evaluated five arguments favoring their introduction: jobs, national security, infant industries, unfair competition, and bargaining strategy.

Most academic economists oppose tariffs in principle.⁵² However, this is not a unanimous view. For instance, Michael Pettis has argued that most economic discussions of tariffs are more ideological than logical.⁵³ Instead, the conditions under which trade intervention policies are made carry far greater weight. According to Pettis, the idea that all countries lose in a trade war is logically impossible. Rather, tariffs can have a wide variety of economic effects.

49. See Francisco Rodriguez & Dani Rodrik, *Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence*, in NBER MACROECONOMICS ANNUAL 2000: VOLUME 15, at 261, 262 (Ben S. Bernanke & Kenneth S. Rogoff eds., 2001).

50. See Jakob B. Madsen, *Trade Barriers, Openness, and Economic Growth*, 76 S. ECON. J. 397, 398 (2009).

51. See N. GREGORY MANKIW, *PRINCIPLES OF ECONOMICS* 167–86 (8th ed. 2017).

52. See Tim Worstall, *100% of Economists Asked Said Import Tariffs Were Not a Good Idea*, FORBES (Dec. 23, 2016, 6:48 AM), <https://www.forbes.com/sites/timworstall/2016/12/23/100-of-economists-asked-said-import-tariffs-were-not-a-good-idea> [<https://perma.cc/XE7L-PQWL>].

53. See Michael Pettis, *Tariffs and Trade Intervention*, CARNEGIE ENDOWMENT FOR INT'L PEACE (July 10, 2018), <https://carnegieendowment.org/chinafinancialmarkets/76777> [<https://perma.cc/J5PB-ZZ5R>].

B. The International Law of Tariffs and Trade Barriers

We now turn to the international law of tariffs and trade barriers. Alongside the economic literature on tariffs and theories of international trade, a deep and diverse literature addresses the international agreements that seek to promote international trade by reducing or eliminating barriers such as tariffs or quotas.

After the great economic crisis of 1929, international economic integration almost halted altogether, and countries adopted protectionist policies. The American contribution to the retaliatory tariff policies of that age took the form of the Smoot–Hawley Tariff Act of 1930,⁵⁴ which is still codified (albeit in heavily amended form) in contemporary law.⁵⁵ Canada immediately retaliated by imposing new tariffs on sixteen products comprising nearly a third of that nation’s imports from the United States.⁵⁶ By 1935, “every country in Europe was using almost every known method of trade restriction.”⁵⁷

Smoot–Hawley and foreign responses to that law are thought to be responsible for reducing American imports and exports by as much as two-thirds during the Great Depression.⁵⁸ Globally, tariffs and nontariff barriers reduced international trade volumes by a third from 1929 to 1932.⁵⁹ American economic historians, ever a contentious lot, agree that the “passage of the Smoot-Hawley Tariff exacerbated the Great Depression.”⁶⁰

54. See Smoot-Hawley Tariff Act of 1930, ch. 497, 46 Stat. 590. See generally, e.g., Barry Eichengreen, *The Political Economy of the Smoot-Hawley Tariff*, in INTERNATIONAL POLITICAL ECONOMY: PERSPECTIVES ON GLOBAL POWER AND WEALTH 37 (Jeffrey A. Frieden & David A. Lake eds., 4th ed. 2000); Douglas A. Irwin, *The Smoot-Hawley Tariff: A Quantitative Assessment*, 80 REV. ECON. & STAT. 326 (1997); Gabriel Siles-Brügge, *Explaining the Resilience of Free Trade: The Smoot–Hawley Myth and the Crisis*, 21 REV. INT’L POL. ECON. 535 (2014).

55. See 19 U.S.C. §§ 1202–1683g (2018); *id.* § 1654 (“This chapter may be cited as the ‘Tariff Act of 1930.’”).

56. See WILSON B. BROWN & JAN S. HOGENDORN, INTERNATIONAL ECONOMICS: IN THE AGE OF GLOBALIZATION 246 (2000).

57. PHILIP FRIEDMAN, THE IMPACT OF TRADE DESTRUCTION ON NATIONAL INCOMES: A STUDY OF EUROPE 1924–1938, at 31 (William E. Carter et al. eds., 1974); accord Jakob B. Madsen, *Trade Barriers and the Collapse of World Trade During the Great Depression*, 67 S. ECON. J. 848, 858 (2001).

58. See ALFRED E. ECKES, JR., OPENING AMERICA’S MARKET: U.S. FOREIGN TRADE POLICY SINCE 1776, at 100–03 (1995).

59. See Madsen, *supra* note 57, at 862, 865 tbl.3 & fig.3.

60. Robert Whaples, *Where Is There Consensus Among American Economic Historians? The Results of a Survey on Forty Propositions*, 55 J. ECON. HIST. 139, 151 (1995) (recognizing this “consensus” despite acknowledging that “the central causes

After World War II, the United States made many efforts to establish an international trade regime and liberalize trade arrangements. The United States played a significant and hegemonic role in the formation of liberal capitalist political economy of the world, based on multilateralism and cultural norms.⁶¹ The U.S. government promoted an effort to establish an International Trade Organization (ITO) under the auspices of the United Nations and with a mandate to harmonize trade, employment, and competition law around the world. But the Senate refused to ratify the proposed treaty, alleging that the ITO would interfere with internal economic affairs.⁶²

A worldwide legal framework for trade arose instead as an outgrowth of the Bretton Woods Conference of 1944, initially a meeting of finance ministers from the soon-to-be victorious powers of World War II.⁶³ After additional meetings involving trade ministers, the principal trading nations of the world expanded the scope of the Bretton Woods treaties from the formation of the International Monetary Fund and the International Bank for Reconstruction and Development (World Bank). These first multilateral tariff negotiations led to significant reductions in tariff rates and the General Agreement on Tariffs and Trade (GATT).⁶⁴

Destined to become the “centerpiece of the international economic law system,”⁶⁵ GATT would not have come into existence without the leadership of the United States.⁶⁶ GATT evolved into the principal rulemaking and dispute resolution body for trade in the noncommunist world.⁶⁷ Ironically, the twin calamities of 2016 for

of the depression are still hotly contested”); *see also* PETER FEARON, *WAR, PROSPERITY AND DEPRESSION: THE U.S. ECONOMY, 1917-1945*, at 129 (1987).

61. *See generally* ROBERT O. KEOHANE, *AFTER HEGEMONY: COOPERATION AND DISCORD IN THE WORLD POLITICAL ECONOMY* (2d ed. 2005).

62. *See* PETER B. KENEN, *THE INTERNATIONAL ECONOMY* 215 (4th ed. 2000).

63. *See generally, e.g.,* PETER VAN DEN BOSSCHE & WERNER ZDOUC, *THE LAW AND POLICY OF THE WORLD TRADE ORGANIZATION: TEXT, CASES AND MATERIALS* (4th ed. 2017); KEVIN H. O’ROURKE, *THE INTERNATIONAL TRADING SYSTEM, GLOBALIZATION, AND HISTORY* (2005); Richard Myrus, *From Bretton Woods to Brussels: A Legal Analysis of the Exchange-Rate Arrangements of the International Monetary Fund and the European Community*, 62 *FORDHAM L. REV.* 2095 (1994).

64. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194 [hereinafter GATT].

65. Curtis Reitz, *Enforcement of the General Agreement on Tariffs and Trade*, 17 *U. PA. J. INT’L ECON. L.* 555, 555 (1996).

66. *See generally* DOUGLAS A. IRWIN, PETROS C. MAVROIDIS & ALAN O. SYKES, *THE GENESIS OF THE GATT* 5–97 (2008).

67. *See generally* JOHN H. JACKSON, *WORLD TRADE AND THE LAW OF GATT* (1969).

global trade—Brexit and the election of Donald Trump as U.S. President—directly contradicted the policy impetus that inspired the postwar consensus. Supporters of Brexit lack a credible historical or theoretical basis supporting a return to sequential negotiation of bilateral trade policies with the European Union and other partners.⁶⁸

Even more outlandish was the Trump administration's suggestion that the United States might withdraw from the World Trade Organization.⁶⁹ American experience with its prewar "Trade Agreements Program" had exposed the limits of "bargaining . . . bilaterally and thus sequentially": Negotiating "governments were fearful of offering large tariff cuts because they had to hoard their bargaining power."⁷⁰ The political economy of international trade points to an unequivocal theoretical outcome: Preferential agreements of the sort contemplated by Trump and Brexit opponents undermine efficient multilateral outcomes.⁷¹

GATT contains several obligations, some of which have been further elaborated through separate treaty instruments called "codes." A principal obligation of the GATT is the "tariff binding" which sets a maximum tariff rate for massive lists of products, accepted in "tariff schedules" by each of the contracting parties. When the GATT was established in 1947, it had twenty-three members, eleven of which were developing countries. Although these developing countries held a significant share of world trade, they were neither recognized as a group nor given any special treatment.⁷²

It was not until the 1960s that the principal trading nations gave serious consideration to the distinct interests of developing countries. As a response to the creation of the United Nations Conference on Trade and Development (UNCTAD) in 1964, GATT adopted Part IV

68. Ansgar Belke & Daniel Gros, *The Economic Impact of Brexit: Evidence from Modelling Free Trade Agreements*, 45 ATLANTIC ECON. J. 317 (2017); Michael Emerson, *Which Model for Brexit?*, in AFTER BREXIT: CONSEQUENCES FOR THE EUROPEAN UNION 167 (Nazaré da Costa Cabral, José Renato Gonçalves & Nuno Cunha Rodrigues eds., 2017).

69. Kristen Hopewell, *Trump & Trade: The Crisis in the Multilateral Trading System*, 26 NEW POL. ECON. 271, 271 (2020); Douglas R. Nelson, *Facing up to Trump Administration Mercantilism: The 2018 WTO Trade Policy Review of the United States*, 42 WORLD ECON. 3430 (2019); Joseph E. Stiglitz, *Trump and Globalization*, 40 J. POL'Y MODELING 515, 517–18 (2018).

70. KENEN, *supra* note 62, at 215.

71. See Kyle Bagwell & Robert W. Staiger, *An Economic Theory of GATT*, 89 AM. ECON. REV. 215, 215 (1999).

72. See Edwini Kessie, *The Legal Status of Special and Differential Treatment Provisions Under the WTO Agreements*, in WTO LAW AND DEVELOPING COUNTRIES 12 (George A. Bermann & Petros C. Mavroidis eds., 2010).

on Trade and Development in 1965. Although Part IV expressed concern for the interests of developing countries, it neither expressed nor imposed any legal obligations. Under Part V of the World Trade Organization Treaty, the successor to GATT, the WTO cooperates with UNCTAD and other global organizations.⁷³

The Tokyo Round adopted the so-called Enabling Clause in 1979, which created a permanent legal basis for preferential tariff treatment of exports from developing countries.⁷⁴ This arrangement allowed greater flexibility in the establishment of preferential trade agreements between developing countries. The Enabling Clause introduced the policy of Special and Differential Treatment (SDT) for developing countries. The Tokyo Round gave preferential treatment to tariffs and nontariff barriers, which may be granted to developing countries so that they can agree between themselves. These preferences have become permanently enshrined in the law of international trade.⁷⁵

This policy advanced even further in the Uruguay Round of negotiations, which culminated in the Marrakesh Agreement, the establishment of the World Trade Organization, and a comprehensive revision of GATT.⁷⁶ The successful conclusion of the Uruguay Round is perhaps the most important event in recent world economic history.⁷⁷ The rising tide of trade liberalization, however, will not raise all boats equally: “[T]he agreement will probably most benefit those countries and regions which are in the best ‘competitive’ position a decade or two into the future.”⁷⁸

The Uruguay Round reduced tariff rates around the world, particularly in developed countries. Estimates of welfare gains from

73. See VAN DEN BOSSCHE & ZDOUC, *supra* note 63, at 105–06.

74. See MICHAEL TREBILCOCK, ROBERT HOWSE, & ANTONIA ELIASON, *THE REGULATION OF INTERNATIONAL TRADE* 639 (4th ed. 1995).

75. See generally *id.* at 605–55.

76. See Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Apr. 15, 1994, 1867 U.N.T.S. 14, 33 I.L.M. 1143 (1994); Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1867 U.N.T.S. 154, 33 I.L.M. 1144 (1994) [hereinafter Marrakesh Agreement]; General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994).

77. See Leo Bierman, Donald R. Fraser, & James W. Kolari, *The General Agreement on Tariffs and Trade: World Trade from a Market Perspective*, 17 U. PA. J. INT’L ECON L. 821, 845 (1996).

78. *Id.*

the Uruguay Round range from \$96 billion to \$171 billion per year.⁷⁹ Developed countries benefit by a ratio of 3:1 relative to developing countries.⁸⁰ By contrast, trade liberalization has apparently hurt some developing countries in the short run.⁸¹ The tariff policy of developed countries (Canada, the European Union, the United States, and Japan) has been characterized by customs escalation and high tariffs in certain sectors.⁸² In particular, tariffs on agricultural imports have risen dramatically.⁸³ In addition, the activity has taken the form of increased shipments by incumbent exporters, rather than a broadening of the class of exporters.⁸⁴

Part of the distortion of trade markets after the Uruguay Round appears to be an endemic problem of domestic regulation and vertical coordination within a large customs union. The customs union in question may be a national federation, such as the United States, or a regional pact aspiring to ever closer political as well as economic union, such as the European Union. Self-dealing through nominally nondiscriminatory regulation can arise “[a]nytime a large jurisdiction (lacking the freedom to set tariffs) is allowed to set its regulatory policy unilaterally without regard to the harm” that it may export to competitors or trading partners.⁸⁵ Policies designed to drive tariffs toward zero cannot eliminate economic distortion through nontariff barriers to trade.

79. See Glenn W. Harrison, Thomas F. Rutherford & David G. Tarr, *Quantifying the Uruguay Round*, 107 ECON. J. 1405, 1405 (1997).

80. See Drusilla K. Brown, Alan V. Deardorff & Robert M. Stern, *Computational Analysis of Multilateral Trade Liberalization in the Uruguay Round and Doha Development Round*, in 2 THE WORLD TRADE ORGANIZATION: LEGAL, ECONOMIC AND POLITICAL ANALYSIS 23, 24 (Patrick F. J. Macrory, Arther E. Appleton & Michael G. Plummer eds., 2005).

81. See Harrison, Rutherford & Tarr, *supra* note 79, at 1405.

82. See Robert W. Staiger & Alan O. Sykes, *International Trade, National Treatment, and Domestic Regulation*, 40 J. LEGAL STUD. 149, 184–88 (2011).

83. See, e.g., Kym Anderson, *Agriculture*, in 2 THE WORLD TRADE ORGANIZATION: LEGAL, ECONOMIC AND POLITICAL ANALYSIS, *supra* note 80, at 110; Stephen Devadoss & Jurgen Kropf, *Impacts of Trade Liberalizations Under the Uruguay Round on the World Sugar Market*, 15 AGRIC. ECON. 83, 83 (1996); Jostein Lindland, *The Impact of the Uruguay Round on Tariff Escalation in Agricultural Products*, 22 FOOD POL’Y 487, 488 (1997).

84. See generally Ines Buono & Guy Lalanne, *The Effect of the Uruguay Round on the Intensive and Extensive Margins of Trade*, 86 J. INT’L ECON. 269 (2012).

85. Staiger & Sykes, *supra* note 82, at 155.

Trade organizations can be divided into two systems: rule-oriented and power-oriented.⁸⁶ A rule-oriented system is one in which all relations between members are fully controlled and guided by a discrete set of rules and these rules apply equally to all members. A power-oriented system is one in which all relations between members are fully controlled and guided by the regime's members. As an effective rule-based system, GATT attracted the participation of developing countries.⁸⁷

The World Trade Organization was established in 1994 and is the successor of the GATT.⁸⁸ As pillars of the international trade regime, both GATT and the WTO have strived to encourage and strengthen liberal trade. WTO assumed the role of the GATT through multilateral negotiations.⁸⁹ The concept of multilateral negotiations on market access refers to the eight consecutive rounds of negotiations in the WTO, which led to a significant reduction of tariffs applied to the developed countries as well as the obligations that developing countries take to respect their customs.

Following these revisions, the WTO Doha Ministerial Conference launched the Doha Development Agenda (DDA) in November 2001. The still ongoing DDA puts development issues at the center of the WTO agenda. The unique interests of developing countries dominate many of the topics discussed among the 160 members of the WTO.

A fierce, long-running debate addresses the impact of tariffs and trade liberalization on developing economies. The structure of trade negotiations may offer additional flexibility that favors developing economies. Governments negotiate treaties with one eye on domestic politics and another on the global economy.⁹⁰ Consequently, tariff

86. See SIMON LESTER, BRYAN MERCURIO & ARWEL DAVIES, *WORLD TRADE LAW: TEXT, MATERIALS, AND COMMENTARY* 152 (3d ed. 2018).

87. See MITSUO MATSUSHITA, THOMAS SCHOENBAUM, PETROS C. MAVROIDIS & MICHAEL HAHN, *THE WORLD TRADE ORGANIZATION: LAW, PRACTICE AND POLICY* 695 (3d ed. 2015).

88. See Marrakesh Agreement, *supra* note 77; Agreement Establishing the World Trade Organization, 33 I.L.M. 1144 (1994).

89. See generally KYLE BAGWELL, ROBERT W. STAIGER & ALAN O. SYKES, *Border Instruments*, in *LEGAL AND ECONOMIC PRINCIPLES OF WORLD TRADE LAW* 68 (Henrik Horn & Petros C. Mavroidis eds., 2013).

90. See Giovanni Maggi & Andrés Rodríguez-Clare, *A Political-Economy Theory of Trade Agreements*, 97 AM. ECON. REV. 1374–75 (2007). See generally Gene M. Grossman, *The Purpose of Trade Agreements*, in *1A HANDBOOK OF COMMERCIAL POLICY* 379 (Kyle Bagwell & Robert W. Staiger eds., 2016).

agreements typically take the form of “bindings,” or ceilings on tariff levels, rather than fixed levels or rates.⁹¹

Binding overhang, or the application of rates above nominal levels specified in Consolidated Tariff Schedules, has added further flexibility to tariff policies, especially in the face of sudden surges in imports.⁹² Solicitude for developing countries may offset, if only partially, the structural disparities that poorer trading partners face in high-stakes proceedings such as antidumping disputes.⁹³

Historically, developing countries have enjoyed special and differential treatment (SDT) purportedly commensurate with their developmental, financial, and trade-related needs. The typical vehicle for SDT is the generalized system of preferences (GSP) through which developed countries grant tariff concessions or zero-tariff market access to certain products originating in developing countries.⁹⁴

In practice, GSP provisions commonly incorporate conditionality whereby the tariff concession is tied to some requirement that the developing country must meet. GSP provisions are often evaluated under the rubric of “linkage,” a term used to describe the coupling of trade with nontrade issues.⁹⁵ GSP conditions have covered issues such as the enforcement of internationally recognized labor standards and environmental protection. Other linkages include good governance practices and even a requirement that the developing country police drug trafficking within its borders.

91. See Kyle Bagwell & Robert W. Staiger, *The Design of Trade Agreements*, in 1A HANDBOOK OF COMMERCIAL POLICY, *supra* note 90, at 435, 515–24.

92. See Burim Gashi, *Policy of Tariff Protection in the Light of WTO Accession*, 4 ILIRIA INT’L REV. 185, 191 (2014); Mohamed Hedi Bchir, Sébastien Jean & David Laborde, *Binding Overhang and Tariff-Cutting Formulas*, 142 REV. WORLD ECON. 207, 209–10 (2006).

93. See Chad P. Bown, Bernard Hoekman & Caglar Ozden, *The Pattern of US Antidumping: The Path from Initial Filing to WTO Dispute Settlement*, 3 WORLD TRADE REV. 349, 369–70 (2003); Robert W. Staiger & Frank A. Wolak, *Measuring Industry-Specific Protection: Antidumping in the United States*, 1994 BROOKINGS PAPERS ON ECONOMIC ACTIVITY: MICROECONOMICS 51, 53. Retaliatory tariffs for dumping and other abusive trade practices are among the oldest and most thoroughly examined subjects in trade policy. See, e.g., Harry G. Johnson, *Optimum Tariffs and Retaliation*, 21 REV. ECON. STUD. 142, 153 (1953–1954).

94. See generally Emanuel Ornelas & Marcos Ritel, *The Not-So-Generalised Effects of the Generalized System of Preferences*, 43 WORLD ECON. 1809 (2020).

95. See CHRISTIAN BARRY & SANJAY REDDY, INTERNATIONAL TRADE AND LABOR STANDARDS: A PROPOSAL FOR LINKAGE 3–5 (2008); Kevin Kolben, *Integrative Linkage: Combining Public and Private Regulatory Approaches in the Design of Trade and Labor Regimes*, 48 HARV. INT’L L.J. 203, 203 (2007); Giovanni Maggi, *Issue Linkage*, in 1B HANDBOOK OF COMMERCIAL POLICY 514, 514 (Kyle Bagwell & Robert W. Staiger eds., 2016).

If accompanied by the appropriately complementary macroeconomic, social, and labor market policies, nondiscriminatory tariff liberalization should improve the allocation of resources.⁹⁶ Trade liberalization should therefore benefit countries implementing the reform as well as their commercial partners. Developing countries that currently tend to maintain higher and more dispersed tariff barriers are particularly well positioned to benefit from tariff reform. Improved allocation of resources, enhanced competition, wider product variety, and economies of scale associated with tariff reform will enhance economic outcomes and create a better basis for development and poverty reduction strategies.

In some African countries, the pace of implementation of more outward-oriented development strategies has been significantly hindered by fiscal considerations associated with heavy reliance on tariffs as a source of government revenue.⁹⁷ The failure to take fiscal constraints into consideration can be one of the principal causes for failure in trade reform.⁹⁸ Fiscal struggles in Africa highlight the need to combine tariff reform with policies designed to replace any potentially lost tariff revenue, ideally with fewer economic distortions. Adequate accounting for revenue concerns in the design and implementation of tariff reform will undoubtedly facilitate further multilateral tariff liberalization.

II. DATA, VARIABLES, AND METHODOLOGY

Through empirical evaluation of the impact of demographic factors on tariff levels, this Article seeks to harmonize observed tariff policy across forty-five diverse countries with the competing, often contradictory predictions of the theoretical literature. Domestic factors such as per capita income and population will prove to carry greater weight than net migration or its impact on the labor force. These

96. See Przemyslaw Kowalski, *The Doha Development Agenda: Welfare Gains from Further Multilateral Trade Liberalisation with Respect to Tariffs*, in *TRADING UP: ECONOMIC PERSPECTIVES ON DEVELOPMENT ISSUES IN THE MULTILATERAL TRADING SYSTEM* 17, 27 (Org. Econ. Co-operation & Dev. 2006).

97. See U.N. Econ. Comm'n for Afr., *Report and Recommendations of the Ad-Hoc Expert Group Meeting on Maintaining the Governments' Fiscal Base in the Context of a Trade Liberalisation Regime* 4 (2003) [hereinafter UNECA] (*aide memoire* of the conference held in Addis Ababa, Oct. 1–2, 2003).

98. See INTERNATIONAL MONETARY FUND, *CHANGING CUSTOMS: CHALLENGES AND STRATEGIES FOR THE REFORM OF CUSTOMS ADMINISTRATION* 46 (Michael Keen ed., 2003).

findings undermine suggestions that tariffs work in tandem with immigration policies as levers for structuring international relations.

Our empirical analysis relies on two alternative theoretical pillars. The first pillar consists of the traditional econometric approach. More specifically, this Article implements three econometric models: pooled ordinary least squares (OLS), fixed effects, and random effects.

The second pillar rests upon machine learning techniques. Despite their interpretive clarity, generalized linear models and other conventional econometric tools may not provide the most accurate description of relationships among economic variables or predict as yet unseen instances of a phenomenon. Certain machine-learning methods excel in evaluating data that exhibit nonlinear relationships or arise from non-Gaussian stochastic processes.⁹⁹

The “no free lunch” theorem of machine learning holds that it is impossible to know in advance which model is best suited to a particular dataset or predictive goal.¹⁰⁰ *A priori* assumptions cannot supplant experimentation. Accordingly, we have reached beyond conventional econometrics and implemented several machine learning methods. We will apply algorithms based on decision trees and support vector machines.

A. Data

The panel dataset includes forty-five countries for the period 2000–2018: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Rep., Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Russian Federation, Saudi Arabia, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States. All of these countries belong to either the OECD or the Group of Twenty (G20). The reasons for choosing the specific period and the countries are strictly dictated by data availability.

99. See Leo Breiman, *Statistical Modeling: The Two Cultures*, 16 STAT. SCI. 199, 203–05 (2001).

100. See David H. Wolpert, *The Lack of A Priori Distinctions Between Learning Algorithms*, 8 NEURAL COMPUTATION 1341, 1343 (1996).

B. Variables

In all three of its econometric models, this Article uses the weighted mean applied tariff (TAR), which is the average of effectively applied rates weighted by the product import shares corresponding to each partner country, as the dependent variable. The set of independent variables for the selected countries includes the natural logarithm of the adjusted net national Income (IINC) per capita, the total labor force (ILF), the net migration (IMIG), and the total population. We also include exports of goods and services (EXP), final consumption expenditures (CONS), net inflows of foreign direct investment (FDI), and imports of goods and services (IMP), each as a percentage of the relevant country's gross domestic product (GDP).

All the above variables have been derived from the World Bank open access dataset.¹⁰¹ Table 1 reports the main summary statistics of all variables used in the econometric approach.

Table 1: Descriptive Statistics

Variable		Mean	Std.Dev.	Min	Max	Observations	
TAR	overall	3.203	2.816	-0.101	26.51	N	= 900
	between		2.237	1.54	11.32	n	= 45
	within		1.742	-4.122	18.4	T	= 20
IINC	overall	9.646	1.036	5.958	11.32	N	= 900
	between		0.976	6.823	10.96	n	= 45
	within		0.375	8.161	10.74	T	= 20
EXP	overall	44.24	29.93	9.043	221.2	N	= 898
	between		29.17	11.53	180.8	n	= 45
	within		7.884	2.331	84.63	T	= 19.96
CONS	overall	73.69	8.44	42.37	91.67	N	= 898
	between		8.021	49.97	87.82	n	= 45
	within		2.85	58.13	87.13	T	= 19.96
FDI	overall	4,482	9,326	-58,32	86,59	N	= 900

101. *World Bank Open Data*, WORLD BANK, <https://data.worldbank.org/> [https://perma.cc/ZFN8-7ZA4] (last visited Apr. 5, 2021).

	between		4,932	0,277	22,46	n	=	45
	within		7,948	-74,63	68,61	T	=	20
IMP	overall	41.65	25.52	9.195	187.2	N	=	898
	between		25.04	12.96	150.1	n	=	45
	within		6.115	6.707	78.67	T	=	19.96
ILF	overall	16.1	1.764	12.04	20.48	N	=	900
	between		1.781	12.15	20.46	n	=	45
	within		0.0832	15.67	16.49	T	=	20
IMIG	overall	0.00979	0.0318	-0.429	0.0971	N	=	900
	between		0.0224	-0.069	0.0717	n	=	45
	within		0.0228	-0.35	0.0893	T	=	20
IPOP	overall	16.83	1.791	12.55	21.06	N	=	900
	between		1.81	12.66	21.01	n	=	45
	within		0.0594	16.56	17.07	T	=	20
TAXC	overall	46.48	18.45	14.6	182.3	N	=	900
	between		17.02	15.17	110.7	n	=	45
	within		7.541	24.35	166.4	T	=	20

Notes: TAR: Tariff rate, applied, weighted mean, all products (%); INC: Adjusted net national income per capita (current US\$); EXP: Exports of goods and services (% of GDP); CONS: Final consumption expenditure (% of GDP); FDI: Foreign direct investment, net inflows (% of GDP); IMP: Imports of goods and services (% of GDP); LF: Labor force, total; MIG: Net migration; POP: Population, total; TAXC: Total tax and contribution rate (% of profit).

Table 1 shows that the sample data are well behaved and exhibit controlled variability in relation to the mean of the population. The ratio of the standard deviation to the average is close to zero in most cases.

An additional complication that arises in connection with panel data, as opposed to time series, is the possibility that the sample variables or the random disturbances are correlated across the panel.¹⁰² The early literature on unit root and cointegration tests adopted the

102. See M. HASHEM PESARAN, TIME SERIES AND PANEL DATA ECONOMETRICS 3 (2015).

assumption of no cross-sectional dependence. However, it is common for macro-level data to violate this assumption, which will result in low power and size distortions of tests that assume cross-sectional independence.¹⁰³ For example, cross-section dependence in our data may arise as a result of common unobserved effects due to changes in countries' migration policies. We tackle this issue by employing the proper tests to investigate the existence of cross-sectional dependence in our sample—namely, Pesaran's CD test.¹⁰⁴

To examine the stationarity properties of the variables in our models, we use the second-generation panel unit root tests developed by Maddala and Wu¹⁰⁵ and by Pesaran.¹⁰⁶ These tests are suitable for balanced panel datasets and cross-section dependence. The null hypothesis of a unit root (non-stationarity) cannot be rejected for all the sample variables. The failure to reject the null hypothesis means that the variables contain a unit root—in other words, the variables are integrated of order one because their first difference is stationary—as might be expected from a visual inspection of their time series. In order to investigate whether a long-run equilibrium relationship exists among the sample variables, we implement Pedroni's augmented-Dickey-Fuller-based (ADF) and Phillips-Perron-based cointegration

103. See Michael L. Polemis & Mike G. Tsionas, *Bayesian Nonlinear Panel Cointegration: An Empirical Application to the EKC Hypothesis*, 12 LETTERS SPATIAL & RES. SCIS. 113, 116–17 (2019).

104. See M. Hashem Pesaran, *General Diagnostic Tests for Cross-Sectional Dependence in Panels*, 60 EMPIRICAL ECONS. 13, 13 (2021); see also Rafael E. De Hoyos & Vasilis Sarafidis, *Testing for Cross-Sectional Dependence in Panel-Data Models*, 6 STATA J. 482, 485–86 (2006); M. Hashem Pesaran, *Testing Weak Cross-Sectional Dependence in Large Panels*, 34 ECONOMETRIC REVS. 1089, 1090–91 (2015); M. Hashem Pesaran, *Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure*, 74 ECONOMETRICA 967 (2006).

105. See G.S. Maddala & Shaowen Wu, *A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test*, 61 OXFORD BULL. ECON. & STAT. 631, 647–50 (1999).

106. See PESARAN, *supra* note 102, at 835–36; Pesaran, *General Diagnostic Tests for Cross-Sectional Dependence in Panels*, *supra* note 104, at 23–25.

tests.¹⁰⁷ We also apply Kao's ADF tests.¹⁰⁸ All of these tests suggest the rejection of the null hypothesis of no cointegration at any level of significance.

C. Methodology

This study adopts a fixed effects model and a random effects model to properly account for the imposition of possible effects on tariff rate due to structural demographic changes in each country. We supplement our analysis by using a traditional pooled OLS method to compare and contrast our findings.

1. Pooled OLS

When constant coefficients (intercepts and slopes) are assumed, the pooled regression model captures the initial dependence of demographics to the tariff rate. The pooled OLS regression model can be presented in the following form:

$$TAR_{it} = \beta_0 + x'_{it}\beta + u_{it} \quad (1)$$

where, x'_{it} is the array of the independent variables, β is the vector of the coefficients, and u_{it} is the error term.

2. Fixed Effects Model

Following the traditional OLS estimation, which is usually employed when the selection sample consists of different subsamples for each period of the panel data, this study uses the fixed effects model (FE). The FE model is simply a linear regression model where the intercept terms vary over the individual units i :

107. See Peter Pedroni, *Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors*, 61 OXFORD BULL. ECON. & STAT. 653, 658 (1999); Peter C.B. Phillips & Pierre Perron, *Testing for a Unit Root in Time Series Regression*, 75 BIOMETRIKA 335, 337–45 (1988); Said E. Said & David A. Dickey, *Testing for Unit Roots in Autoregressive-Moving Average Models of Unknown Order*, 71 BIOMETRIKA 599, 599, 601–02, 604–06 (1984). See generally WAYNE A. FULLER, INTRODUCTION TO STATISTICAL TIME SERIES §§ 10.1–.2, at 546–83 (2d ed. 1996).

108. Chihwa Kao, *Spurious Regression and Residual-Based Tests for Cointegration in Panel Data*, 90 J. ECONOMETRICS 1, 3–6 (1999); accord Laura Barbieri, *Panel Cointegration Tests: A Survey*, 116 RIVISTA INTERNAZIONALE DI SCIENZE SOCIALI 3, 7–11 (2008).

$$y_{it} = \alpha_i + x'_{it}\beta + \varepsilon_{it}, \varepsilon_{it} \sim \text{IID}(0, \sigma_\varepsilon^2) \quad (2)$$

where it is usually assumed that all x_{it} are independent of all ε_{it} . We can write this in the usual regression framework by including a dummy variable for each unit i in the model:

$$y_{it} = \sum_{j=1}^N \alpha_j d_{ij} x'_{it}\beta + \varepsilon_{it} \quad (2)$$

where $d_{ij} = 1$ when $i = j$ and 0 elsewhere.¹⁰⁹

We have also assumed the strictly exogenous regressors case in the conditional moments.¹¹⁰ We have not assumed equal sized groups in the panel. The vector β is a set of parameters of primary interest. α_j is the group-specific heterogeneity. Although we have included time-specific effects, they prove to be only tangential. Since the number of periods is usually fairly small, these can usually be accommodated simply through the addition of a set of time-specific dummy variables. We are interested in the case in which N is too large to do likewise for group effects.

3. Random Effects Model

Fixed or random effects are employed when the panel dataset includes the same sample of countries.¹¹¹ Because this study covers forty-five countries from 2000 to 2018, the use of both fixed and random effects modeling is advised. In addition, it is commonly assumed in regression analysis that all factors affecting the dependent variable, but that have not been included as regressors, can be appropriately summarized by a random error term.¹¹² In our case, this leads to the assumption that group-specific heterogeneity, α_i , represents random factors, independently and identically distributed over individual observations.

Therefore, the random effects model can be written as:

$$y_{it} = \mu + \alpha_i + x'_{it}\beta + \varepsilon_{it}, \varepsilon_{it} \sim \text{IID}(0, \sigma_\varepsilon^2); \alpha_i \sim \text{IID}(0, \sigma_\alpha^2) \quad (3)$$

109. See MARNO VERBEEK, *A GUIDE TO MODERN ECONOMETRICS* 345 (2d ed. 2004).

110. See JEFFREY M. WOOLDRIDGE, *INTRODUCTORY ECONOMETRICS: A MODERN APPROACH* § 12.2, at 416–18 (5th ed. 2012).

111. See *id.* § 14.2, at 495–96.

112. See VERBEEK, *supra* note 109, at 347.

where $a_i + \varepsilon_{it}$ is treated as an error term consisting of two components: an individual specific component, which does not vary over time, and a remainder component, which is assumed to be uncorrelated over time. It is also assumed that a_i and ε_{it} are mutually independent and independent of x_{js} (for all j and s).

Given the nature of the underlying model, we would expect a fixed effects model to be more appropriate than a random effects model. The static fixed effects model avoids potential biases that could arise in the random effects model from the correlation between the included exogenous variables and omitted country attributes.¹¹³

Generally speaking, the Hausman test recommends the random effects model under the null hypothesis because of its higher efficiency.¹¹⁴ By contrast, the Hausman test prefers the fixed effects model for its consistency when the null hypothesis is rejected.

H₀ is true — The null hypothesis is retained	H₁ is true — The null hypothesis is rejected	The Hausman test recommends:
<i>Consistent and efficient</i>	Inconsistent	Random effects model
Consistent but inefficient	<i>Consistent</i>	Fixed effects model

After testing this assumption using the Hausman test, we consistently rejected the random effects model in favor of a fixed effects model.

113. See Charalampos Agiropoulos, Michael L. Polemis, Michael Siopsis & Sotiris Karkalakos, *Revisiting the Finance-Growth Nexus: A Socioeconomic Approach*, 25 INT’L J. FIN. & ECON. 1, 10 (2020); John Cubbin & Jon Stern, *The Impact of Regulatory Governance and Privatization on Electricity Industry Generation Capacity in Developing Economies*, 20 WORLD BANK ECON. REV. 115, 123 (2006).

114. See J. Durbin, *Errors in Variables*, 22 REV. INT’L STAT. INST. 23, 27 (1954); J.A. Hausman, *Specification Tests in Econometrics*, 46 ECONOMETRICA 1251, 1251–52 (1978); Alice Nakamura & Masao Nakamura, *On the Relationships Among Several Specification Error Tests Presented by Durbin, Wu, and Hausman*, 49 ECONOMETRICA 1583, 1583 (1981); De-Min Wu, *Alternative Tests of Independence Between Stochastic Regressors and Disturbances*, 41 ECONOMETRICA 733, 747 (1973).

4. Machine Learning

We now describe our application of supervised machine learning.¹¹⁵ Machine-learning models require special data preparation and a common approach to balancing bias against variance through hyperparameter testing. We therefore discuss those preparatory steps before specifying our machine-learning models and comparing them to conventional econometric models.

a. Data preparation

The supervised machine learning methods applied to this dataset required the splitting of data into randomized subsets for training and test. This practice, rarely followed in conventional econometrics, ensures that machine learning methods do not merely memorize labels or values associated with data to be predicted.¹¹⁶

Holding out a fraction of the dataset for testing promotes the generalizability of any supervised machine learning model to data not seen during training.¹¹⁷ In line with these recommended practices, we split our data into training and test subsets containing 75% and 25%, respectively, of the entire dataset and will report training and test results separately.

To ensure reproducible results, we set a seed of one for scikit-learn's pseudo-random number generator. This random seed governed not only the splitting of data into training and test subsets, but also the inherently stochastic processes underlying algorithms such as the random forest and extra trees. Random seeding thus ensures reproducibility of results.

Many machine learning algorithms perform more accurately when data is scaled.¹¹⁸ We applied standard scaling to training data. In other words, our machine learning methods evaluated all and reported all results in terms of Gaussian z-scores, or multiples of a dependent or independent variable's standard deviation from its mean. Care must be taken to withhold test data while scaling the training data and then

115. Much of the discussion in this section summarizes the methodological observations in *Split Decisions*, *supra* note *, and *Introduction to Machine Learning*, *supra* note *.

116. See ANDREAS C. MÜLLER & SARAH GUIDO, *INTRODUCTION TO MACHINE LEARNING WITH PYTHON: A GUIDE FOR DATA SCIENTISTS* 17–18 (2017).

117. See *id.*

118. See *id.* at 133–34.

applying the scale of the training data to the test data, lest data leakage contaminate all predictive tests.¹¹⁹

b. Bias, Variance, and Hyperparameter Tuning

Proper use of machine learning requires careful management of the *bias-variance* tradeoff. This dilemma arises from an intrinsic property of supervised machine learning: Greater inaccuracy, or bias, in the estimates of a model's parameters can reduce the variance among parameter estimates across samples.¹²⁰ While excessive bias reduces a model's accuracy during training, excessive variance hampers efforts to extend supervised machine learning beyond the data on which a model has been trained.¹²¹

Roughly speaking, *bias* refers to a model's overall accuracy. Excessive bias results in a model that *underfits* its data. Models overfit to training data do not provide reliable results unless they generalize well to new, unseen data. High-variance models tend to *overfit* training data. *Variance* therefore affects the generalizability and consistency of results with new data. At the optimal level of complexity, a model strikes the best attainable balance between under- and overfitting.

Many machine learning models offer a wide, sometimes daunting, list of adjustable hyperparameters.¹²² Unless those settings are properly tuned, a machine-learning model may fall far short of its predictive potential. We obtained all of our machine-learning results by conducting a grid search of each algorithm's hyperparameter space and then performing *k*-folds cross-validation.¹²³

119. See *id.* at 138–40.

120. See Ron Kohavi & David H. Wolpert, *Bias Plus Variance Decomposition for Zero-One Loss Functions*, in ICML '96: PROCEEDINGS OF THE THIRTEENTH INTERNATIONAL CONFERENCE ON INTERNATIONAL CONFERENCE ON MACHINE LEARNING 275, 281–82 (Lorenza Saitta ed., 1996).

121. See Stuart Geman, Elie Bienenstock & René Doursat, *Neural Networks and the Bias/Variance Dilemma*, 4 NEURAL COMPUTATION 1, 2 (1992).

122. See AURÉLIEN GÉRON, HANDS-ON MACHINE LEARNING WITH SCIKIT-LEARN, KERAS & TENSORFLOW: CONCEPTS, TOOLS, AND TECHNIQUES TO BUILD INTELLIGENT SYSTEMS 31–32 (2d ed. 2019).

123. See generally MÜLLER & GUIDO, *supra* note 116, at 258–82 (outlining grid search and cross-validation techniques for hyperparameter optimization).

c. Trees, Forests, and Support Vector Machines

The classification and regression tree (CART) algorithm supports a dazzling constellation of machine learning methods.¹²⁴ Decision trees and their ensembles often outperform linear regression. They are not limited to linear relationships. All decision tree-based algorithms are robust in the presence of outliers and quite forgiving of misspecified models. The inclusion of weakly predictive or even wholly nonpredictive variables generally does not weaken a decision tree-based method.

Among ensemble and boosting methods based on aggregations of decision trees, random forests are perhaps the simplest.¹²⁵ Random forests require the tuning of just two hyperparameters: the maximum number of features that a randomized tree may contain, plus the maximum depth of each tree (or the number of splits we will allow within each tree). Randomizing the threshold for each predictor yields an even more stochastic algorithm called *extremely random trees*, or extra trees.¹²⁶

Boosting represents a special class of ensembles that combine weak learners into a strong learner.¹²⁷ Each step in the sequential training of predictors seeks to correct mistakes made by its predecessor.¹²⁸ Rather than adjusting the weights for each instance, the gradient-based approach to boosting fits each new predictor to the previous predictor's residual errors.¹²⁹ XGBoost, or Extreme Gradient

124. See generally LEO BREIMAN, JEROME H. FRIEDMAN, RICHARD A. OLSHEN & CHARLES J. STONE, *CLASSIFICATION AND REGRESSION TREES* (1984); Wei-Yin Loh, *Classification and Regression Tree Methods*, in *ENCYCLOPEDIA OF STATISTICS QUALITY AND RELIABILITY* 315–23 (Fabrizio Ruggeri, Ron S. Kenett & Frederick W. Faltin eds., 2008).

125. See Tin Kam Ho, *Random Decision Forests*, in 1 *PROCEEDINGS OF 3RD INTERNATIONAL CONFERENCE ON DOCUMENT ANALYSIS AND RECOGNITION* 278, 278–82 (1995).

126. See Pierre Geurts, Damien Ernst & Louis Wehenkel, *Extremely Randomized Trees*, 63 *MACH. LEARNING* 3, 5–7 (2006).

127. See Harris Drucker & Corinna Cortes, *Boosting Decision Trees*, 8 *ADVANCES NEURAL INFO. PROCESSING SYS.* 470, 472 (1996).

128. See GÉRON, *supra* note 122, at 199.

129. See Leo Breiman, *Arcing Classifiers*, 26 *ANNALS STAT.* 801, 809–10, 822–23 (1998) (explaining how combining individually weak classifiers may reduce test set error); Jerome H. Friedman, *Greedy Function Approximation: A Gradient Boosting Machine*, in 29 *ANNALS STAT.* 1189, 1192–94 (2001).

Boosting, overcomes limits on speed and scalability that have plagued other boosting algorithms.¹³⁰

One weakness of decision trees and tree-based ensemble and boosting methods is that they are not amenable to evaluation according to *p*-values, confidence intervals, and conventional tests of statistical significance. But the contribution of each predictive variable can be quantified. All tree-based methods in scikit-learn report “feature importances,” a vector of values whose sum is one and whose individual values correspond to each regressor’s contribution to the model’s predictions.¹³¹ Specifically, feature importances in scikit-learn “is a weighted average, where each node’s weight” in a decision tree or across all trees in a forest “is equal to the number of training samples that are associated with it.”¹³²

We will also report results from support vector machine regression.¹³³ This powerful and versatile class of machine learning algorithms has been applied to a wide range of regression tasks, including time-series prediction of stock returns.¹³⁴ Support vector machine regression performs especially well with complicated, “highly nonlinear objects.”¹³⁵ Although support vector machines do not report feature importances, they provide additional validation of results obtained through traditional econometric methods and through decision tree-based ensemble and boosting methods such as random forests, extra trees, and XGBoost.

d. The Relationship Between Conventional Econometric Tests and Machine Learning

Regression models of greatest interest to law and policymaking fall into two broad categories. Some controversies place “primary concern” on “the value of the[] coefficients” of explanatory variables

130. See Tianqi Chen & Carlos Guestrin, *XGBoost: A Scalable Tree Boosting System*, in PROCEEDINGS OF THE 22ND ACM SIGKDD INTERNATIONAL CONFERENCE ON KNOWLEDGE DISCOVERY AND DATA MINING 785, 789–91 (2016).

131. See GÉRON, *supra* note 122, at 198–99.

132. *Id.* at 199.

133. See generally *id.* at 153–74.

134. See Haiqin Yang, Laiwan Chan & Irwin King, *Support Vector Machine Regression for Volatile Stock Market Prediction*, in INTERNATIONAL CONFERENCE ON INTELLIGENT DATA ENGINEERING AND AUTOMATED LEARNING 391, 392–94 (2002).

135. Roman M. Balabin & Ekaterina I. Lomakina, *Support Vector Machine Regression (SVR/LS-SVM) — An Alternative to Neural Networks (ANNs) for Analytical Chemistry? Comparison of Nonlinear Methods on Near Infrared (NIR) Spectroscopy Data*, 136 ANALYST 1703, 1703, 1710–11 (2011).

in a regression model.¹³⁶ Others direct “the focus of attention” toward “the computed value of the dependent variable.”¹³⁷ Because this Article seeks to recommend policies based on quantitative relationships between demographic variables and tariff levels, this Article falls into the former category.

In circumstances such as these, where the sign and scale of regression coefficients matter more than predictive accuracy, machine learning should be applied in conjunction with conventional econometric models. At a minimum, machine-learning deployments should include at least one generalized linear model and exploratory data analysis so that information such as positive and negative correlations and confidence intervals can be obtained. Feature importances from decision trees and forest-based ensembles should be regarded as complements to linear coefficients, rather than substitutes for them.

We will consequently present machine-learning results as an extension of our base econometric models. In this Article, as in other studies involving panel data, the methodological balance between conventional econometrics and machine learning or vice versa hinges on practical rather than mathematical considerations.

III. RESULTS AND INTERPRETATION

We now discuss results from conventional econometric modeling and supervised machine learning.

A. Conventional Econometric Modeling

Although classical regressions uncover several expected interactions, the correlation matrix of dependent and independent variables can challenge some of the regression findings. Table 2 illustrates the correlation matrix for all independent and dependent variables. Most of the correlation coefficients are statistically significant at the 1% significance level. Small values of the correlation coefficient are reported not significant as a result of the poor performance of the traditional test with respect to the size.¹³⁸ More

136. Michael O. Finkelstein, *Regression Models in Administrative Proceedings*, 86 HARV. L. REV. 1442, 1445 (1973).

137. *Id.*

138. See Christos Agiakloglou & Charalampos Agiropoulos, *The Balance Between Size and Power in Testing for Linear Association for Two Stationary AR(1) Processes*, 23 APPLIED ECONS. LETTERS 230, 233 (2015).

specifically, tariff rates appear to be negatively correlated with the (logarithm of adjusted net national) income per capita at all significance levels for all three models (pooled OLS, fixed effects, and random effects).

Table 2 reports negative correlations between the tariff rate and adjusted national income per capita, exports and imports of goods and services, and foreign direct investments at the 1% significance level. The negative relationship between tariff levels and income may arise from a simple fiscal mechanism: When income per capita increases, tax collected from that income is probably sufficient to cover the needs of the government. Consequently, the government does not need to levy tariffs in order to supplement its flows.

On the other hand, the tariff rate shows a positive correlation with the labor force, the population, and the total tax and contribution rate at 1% significance level. Notably, consumption as a percentage of GDP appears to be weakly (and not significantly) correlated with the tariff rate.

Table 2: Correlation Table

Variables	TAR	Log_INC	EXP	CONS	FDI	IMP	Log_LF	Perc_MIG	Log_POP	TAXC
TAR	1									
Log_INC	-0.585*	1								
EXP	-0.302*	0.314*	1							
CONS	-0.046	-0.075	-0.556*	1						
FDI	-0.101*	0.121*	0.372*	-0.219*	1					
IMP	-0.345*	0.286*	0.975*	-0.425*	0.363*	1				
Log_LF	0.420*	-0.447*	-0.613*	0.063	-0.203*	-0.647*	1			
Perc_MIG	-0.081	0.295*	0.229*	-0.361*	0.102*	0.151*	-0.063	1		
Log_POP	0.431*	-0.470*	-0.609*	0.068	-0.201*	-0.643*	0.998*	-0.065	1	
TAXC	0.340*	-0.329*	-0.340*	0.247*	-0.098*	-0.320*	0.367*	-0.150*	0.3660*	1

Notes: * significant at 1%

TAR: Tariff rate, applied, weighted mean, all products (%); INC: Adjusted net national income per capita (current US\$); EXP: Exports of goods and services (% of GDP); CONS: Final consumption expenditure (% of GDP); FDI: Foreign direct investment, net inflows (% of GDP); IMP: Imports of goods and services (% of GDP); LF: Labor force, total; MIG: Net migration; POP: Population, total; TAXC: Total tax and contribution rate (% of profit).

Table 3 presents the regression results of the underlying model where tariff rate is the dependent variable and the independent, right-hand side variables (RHS) include the logarithm of the adjusted net national income per capita (in current U.S. dollars); exports of goods and services; the consumption expenditure; foreign direct investment and imports of goods and services as a percentage of GDP; the logarithm of the labor force; the percentage of net migration over the total population; the total population; and the total tax and contribution rate as a percentage of the profit.

Table 3's regression results report negative coefficients for imports and exports (as a percent of GDP) with statistical significance at the 1% level within the pooled OLS model. In addition, the tariff rate is negatively correlated with the (logarithm of the) population at all significance levels within the fixed effects model. The pooled OLS approach also reports a positive correlation between the tariff rate and the corporate tax rate at 5% significance. The constant term is significant at all levels of significance and in all models.

Table 3 also reports interesting results with respect to adjusted net national income per capita. We have found a negative and statistically significant relationship at 1% significance between tariff rates and the natural logarithm of the national income per capita for all three models (coefficients of -1.437, -1.638, and -1.837 for pooled OLS, fixed effects, and random effects respectively).

More specifically, one might argue that low tariff rates are an artifact of high-income economies, in line with neoclassical predictions that free trade and a political commitment to comparative advantage should raise each nation's productivity and per capita income. Indeed, dissimilar communities could react differently to low tariff rates. Although this study suggests that income per capita significantly affects tariff levels, the actual causal relationship between tariffs and income per capita remains unclear and needs further investigation.

Tariff levels are negatively and significantly related with population. As the population grows, then the tax revenue increases accordingly. Hence, the government may rely on sources of revenue besides tariffs imposed on imports.

Furthermore, this Article provides evidence of the positive relationship of consumption to tariff rates. This connection may arise from an actual economic mechanism: When consumption increases, purchases of foreign goods and services rises relative to their domestic equivalents. Perhaps domestic production does not fully cover demand. Alternatively, consumers may favor imports because of their

quality or stylishness. As a result, a government may impose tariffs in order to support or protect domestic products.

The aforementioned signs in Table 3 could be expected as a matter of intuition. Nevertheless, the signs of the coefficients of exports, imports, and taxes warrant closer consideration. When exports increase, a country might increase tariffs to protect its positive balance. Alternatively, another country might raise tariffs in response to increased trade. The latter interpretation is supported by all of our econometric models.

Likewise, tariff rates appear to increase when imports (as a percentage of GDP) decrease. This is not paradoxical. When a country increases its tariffs, imports should decline in response. Alternatively, an increase or decrease in imports as a percentage of GDP might coincide with a decrease or increase in tariffs (especially in the European Union).

Table 3: Regression Summary

VARIABLES	(1) (Pooled OLS)	(2) (Fixed Effects)	(3) (Random Effects)
Log_INC	-1.437*** (0.001)	-1.638*** (0.000)	-1.837*** (0.004)
EXP	0.094** (0.017)	0.007 (0.681)	0.045 (0.252)
CONS	-0.014 (0.752)	0.077** (0.014)	0.047 (0.304)
FDI	0.003 (0.687)	-0.006 (0.107)	-0.003 (0.214)
IMP	-0.126*** (0.001)	-0.008 (0.730)	-0.065 (0.156)
Log_LF	-0.144 (0.939)	4.421 (0.163)	-0.465 (0.920)
Perc_MIG	2.373 (0.535)	-2.093 (0.153)	-0.532 (0.756)
Log_POP	0.156 (0.932)	-12.948*** (0.001)	0.342 (0.941)
TAXC	0.023** (0.048)	0.007 (0.429)	0.008 (0.487)
Constant	17.726*** (0.000)	159.786*** (0.000)	19.534** (0.018)
Observations	898	898	898
R-squared	0.456	0.732	0.364
Country FE	Yes	Yes	Yes
Number of CountryCode	45	45	45

Notes: Robust standard errors in parentheses; (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$; TAR: Tariff rate, applied, weighted mean, all products (%); INC: Adjusted net national income per capita (current US\$); EXP: Exports of goods and services (% of GDP); CONS: Final consumption expenditure (% of GDP); FDI: Foreign direct

investment, net inflows (% of GDP); IMP: Imports of goods and services (% of GDP); LF: Labor force, total; MIG: Net migration; POP: Population, total; TAXC: Total tax and contribution rate (% of profit).

A positive relationship between tariff rates and domestic tax rates suggests that a country could increase or decrease both rates simultaneously. This outcome appears only within the pooled OLS model. In other words, the countries' dependency is excluded. A simultaneous increase of both rates may arise from an effort to exploit all sources of income at the same time. In addition, countries with higher tax rates may tend to apply higher tariff rates, since tariffs also constitute a form of taxation.

This dataset reveals no statistically significant impact by migration on the level of tariffs. The absence of statistical significance is not necessarily contradictory. Although the host country seems to benefit slightly more than a migrant's country of origin, financial flows returning to the home country compensate for its competitive disadvantage. Consequently, neither the host country nor the country of origin needs to change its tariffs. In all likelihood, the host country benefits immediately, whereas the country of origin benefits later.

B. Machine-Learning Techniques

Our baseline machine learning model is a naked CART decision tree with a maximum depth of seven levels. At least during training, this decision tree performed admirably in learning the relationships between tariffs and their predictor variables. It attained an r^2 value of 0.940610 on training data and an adjusted r^2 of 0.939807. When applied to the test data subset, however, the basic decision tree's performance fell to 0.645096 and 0.630240 respectively.

The application of two tree-based ensemble methods, random forests and extra trees, dramatically improved test set performance. The random forest and extra trees algorithms, respectively, raised r^2 to 0.772733 and 0.798935. Adjusted r^2 for the two algorithms was 0.763218 and 0.790518, respectively.

As with the basic decision tree, these ensembles exhibited some vulnerability to overfitting. Training set performance approached r^2 values of 1.00 in both instances (specifically, 0.968035 and 0.972527). The test set scores are more representative of these ensemble methods' generalizability to unseen data. We would therefore stand on firmer ground in asserting that tree-based ensembles for supervised machine

learning can account for roughly 0.77 to 0.80 of the variability in tariff rates.

The XGBoost model reflected all of these traits, albeit at lower values of r^2 reflecting this model’s relatively greater difficulties with this dataset. Its test r^2 of 0.764403 and test adjusted r^2 of 0.754541 trailed the corresponding accuracy scores of the random forest and extra trees models.

Of arguably greater importance to the interpretation of the predictive model are the vectors of feature importances for all four of these tree- or forest-based methods:

Figure 1:

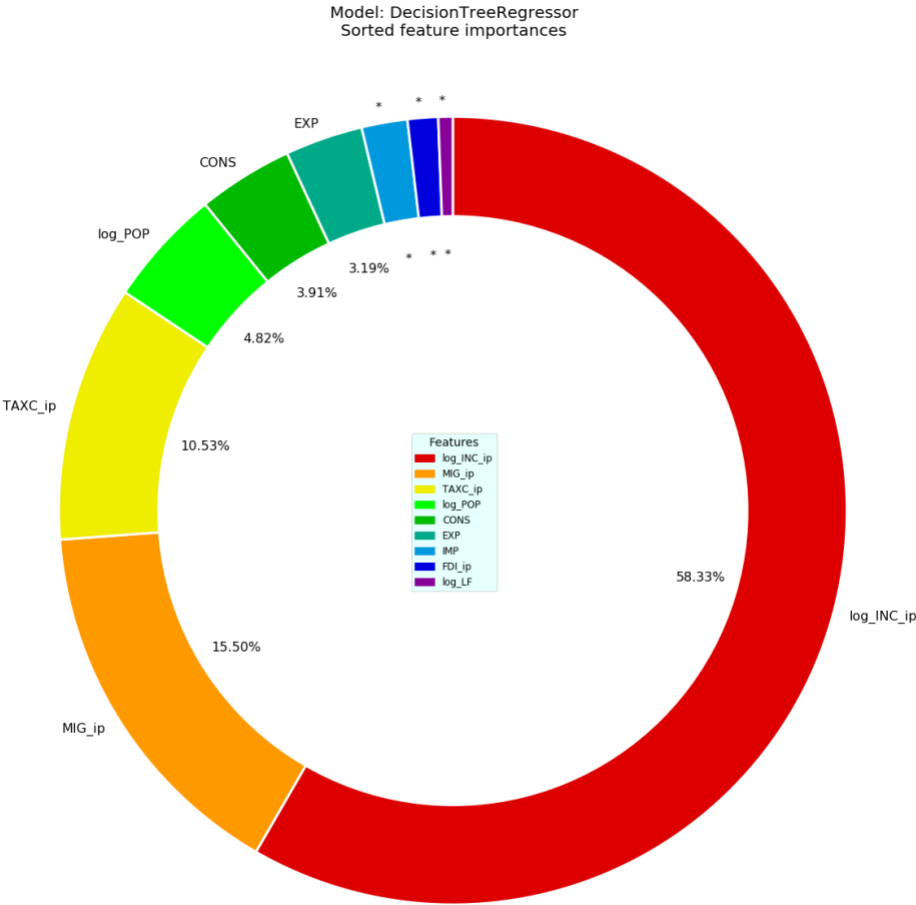


Figure 2:

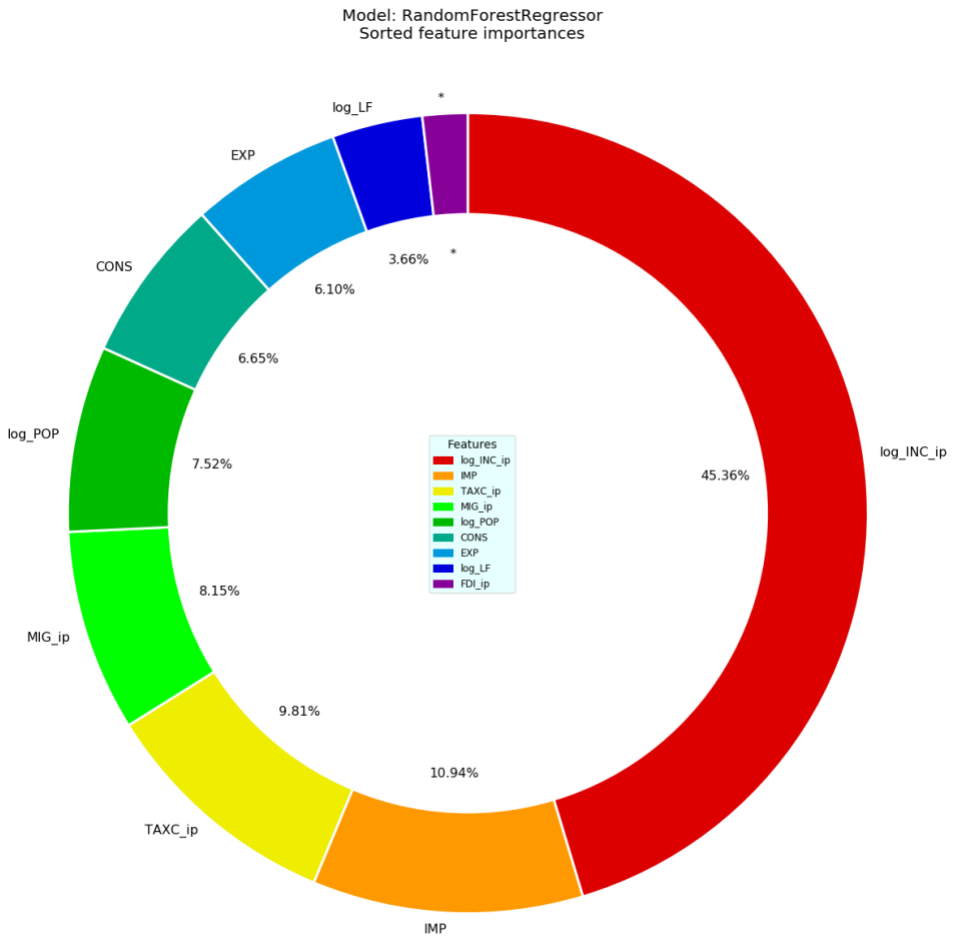


Figure 3:

Model: ExtraTreesRegressor
Sorted feature importances

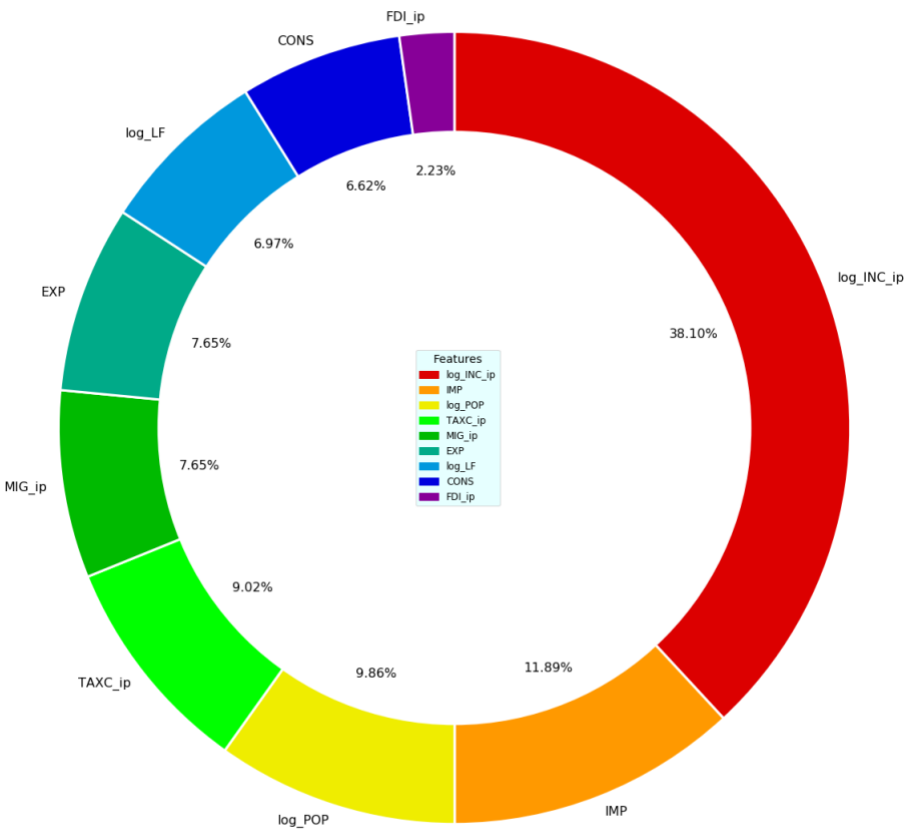
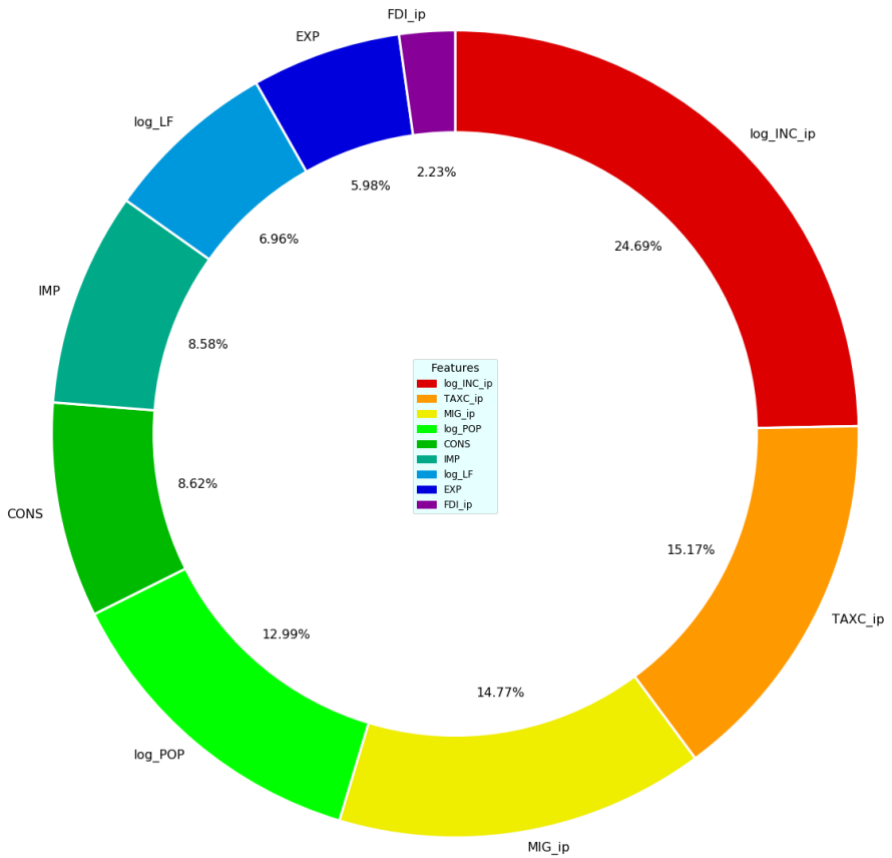


Figure 4:

Model: XGBRegressor
Sorted feature importances



The four sets of features importances are not inconsistent with the conventional methods' identification of statistically significant predictors. Two variables—the logarithm of per capita income and the corporate tax rate—appear among the top three variables in all four vectors of feature importances. Among all predictors, per capita income carries by far the most weight. Three other variables—imports, (the logarithm of) population, and migration—also appeared among the top four. Finally, labor force and foreign direct investment, two variables lacking statistical significance in the pooled OLS, fixed effects, or random effects models, failed to sway any of these four tree-based machine-learning models.

Among the four sets of feature importances, the vector associated with the extra trees model warrants closest attention, because that model outperforms the basic decision tree, random forest, and XGBoost models by a considerable margin. The extra trees vector suggests that per capita income outweighs the next most important feature, imports, by a ratio of more than three to one.

Model accuracy also cuts in the opposite direction: Feature importances associated with a less accurate model are correspondingly less reliable. The models ranking migration as high as second or third among the most important features were the baseline decision tree model and XGBoost. Both of these models trailed the random forest and extra trees ensembles in accuracy. The failure of the econometric models to accord statistical significance to migration likewise undercuts the feature importances reported by XGBoost.

Our support vector regression results are in line with the tree- and forest-based methods. The more commonplace epsilon-optimized method of support vector regression reported an r^2 value of 0.947047 during training and an adjusted r^2 of 0.946331.¹³⁹ Test r^2 fell to 0.777561; adjusted r^2 , to 0.768249. The alternative nu-optimized method for support vector regression¹⁴⁰ offers less accuracy while proving more vulnerable to overfitting.¹⁴¹

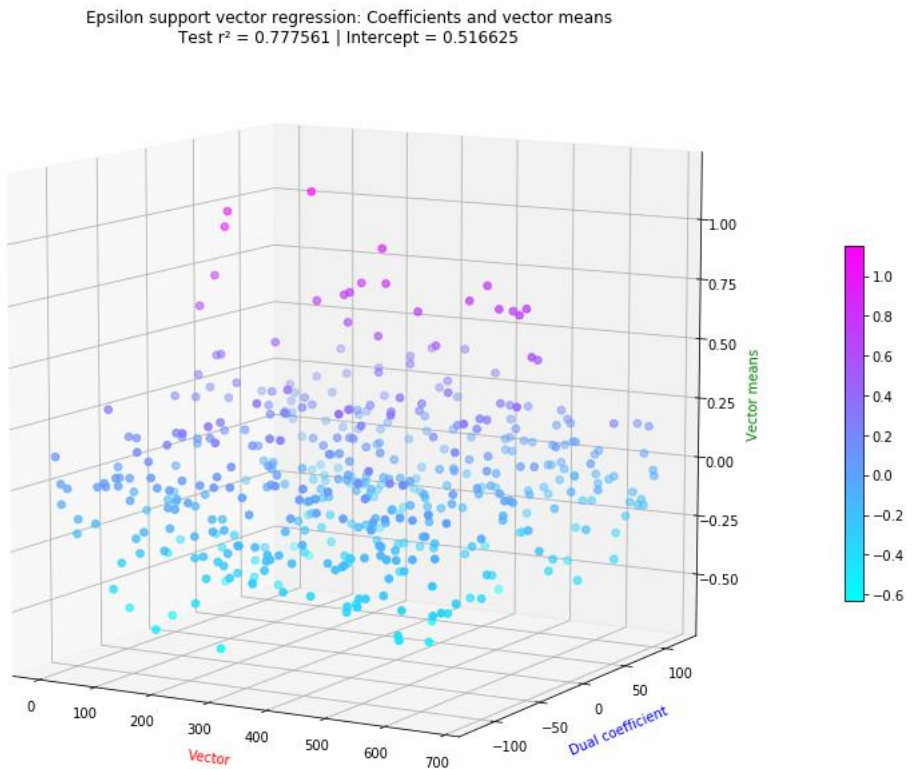
139. See VLADIMIR VAPNIK, *THE NATURE OF STATISTICAL LEARNING THEORY* § 5.6, at 138–46 (2d ed. 2000).

140. See Bernhard Schölkopf, Alex J. Smola, Robert C. Williamson & Peter L. Bartlett, *New Support Vector Algorithms*, 12 *NEURAL COMPUTATION* 1207, 1210–15 (2000) (specifying nu-optimized support vector machines).

141. For fuller, contextual explanations of the difference between epsilon-optimized and nu-optimized support vector machines, see Jakub Langhammer & Julius Česák, *Applicability of a Nu-Support Vector Regression Model for the Completion of Missing Data in Hydrological Time Series*, 8 *WATER* 560, at 6 (2016); Fan Zhang, Chirag Deb, Siew Eang Lee, Junjing Yang & Kwok Wei Shah, *Time Series Forecasting for Building Energy Consumption Using Weighted Support Vector*

Although the eponymous support vectors of the epsilon-optimized model do not bolster the interpretability of its results, their dual coefficients and vector means can be computed and visualized as a three-dimensional plot where the x -axis assigns a unique integer value to each of the observations in the subset of training data:

Figure 5:



Regression with Differential Evolution Optimization Technique, 126 ENERGY & BLDGS. 94, 95–97 (2016).

Table 4 reports training and test set results for each of the machine learning algorithms.

Table 4: Summary of Machine Learning Results

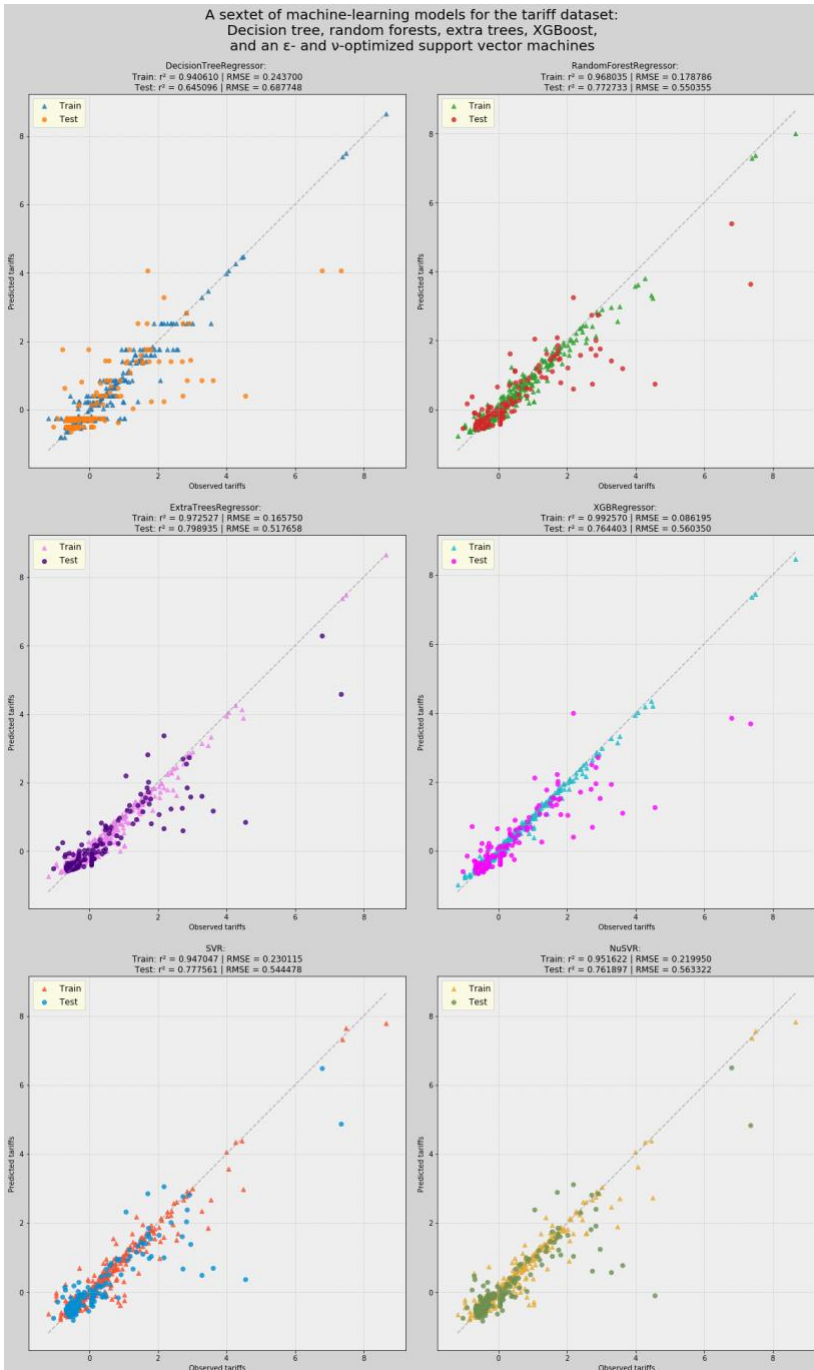
Model	r^2 , training	Adjusted training r^2 ,	r^2 , test	Adjusted r^2 , test
Decision tree	0.940610	0.939807	0.645096	0.630240
Random forest	0.968035	0.967603	0.772733	0.763219
Extra trees	0.972527	0.972155	0.798935	0.790518
XGBoost	0.992570	0.992470	0.764403	0.754541
Support vector (ϵ)	0.947047	0.946331	0.777561	0.768249
Support vector (v)	0.951622	0.950967	0.761897	0.751930

The failure of XGBoost, a highly regarded algorithm, to outperform simpler ensemble methods such as random forests and extra trees shows the fickleness of machine-learning methods. The “no free lunch” theorem holds that it is impossible to know in advance which machine-learning model is best suited to a particular dataset.¹⁴²

The following figure summarizes observed and fitted value for training and test sets for each of these six algorithms. No machine learning model performs particularly well in fitting high tariff rates whose z -scores exceed +2.

142. See Wolpert, *supra* note 100, at 1352–53.

Figure 6:



IV. POLICY RECOMMENDATIONS

“Taxes are what we pay for civilized society.”¹⁴³ As a special form of taxation, tariffs implicate a wide range of political, economic, and demographic factors, at home and on the international stage. We summarize our findings and apply them, in turn, to two of the largest trading blocs represented in our dataset: the European Union and the English-speaking nations of Great Britain and the United States.

A. Overview of Findings

This Article shows that domestic factors, such as per capita income, population, imports, and the domestic income tax rate, outweigh net migration and labor force effects. Alongside foreign direct investment, those latter variables failed to register statistical significance. Machine learning techniques reinforce conclusions drawn from pooled OLS, fixed effects, and random effects models based on traditional econometrics.

As we observed earlier, this Article places greater emphasis on the sign and scale of regression coefficients accompanying independent variables than on the accuracy of our models’ predictions.¹⁴⁴ This quantitative goal favors traditional econometrics over machine learning. At the very least, the interpretive limitations of machine learning counsels us to treat feature importances reported by tree- and forest-based methods as complements rather than substitutes for regression coefficients and indicators of statistical significance accompanying our conventional models.¹⁴⁵

The comparison of inferences drawn from conventional econometric models and from machine learning contains an inevitably qualitative component. Though these approaches do support mathematical inferences, they do so in radically different ways. Feature importances in machine learning most closely resemble standardized regression coefficients (or beta coefficients) in conventional statistics,¹⁴⁶ whose use in causal inference is itself

143. *Compania General de Tabacos de Filipinas v. Collector of Internal Revenue*, 275 U.S. 87, 100 (1927) (Holmes, J., dissenting).

144. See Finkelstein, *supra* note 136, at 1445.

145. See *Introduction to Machine Learning*, *supra* note *, at 14–15.

146. See Thomas B. Newman & Warren S. Browner, *In Defense of Standardized Regression Coefficients*, 2 EPIDEMIOLOGY 383, 383–85 (1991).

controversial.¹⁴⁷ Feature importances differ from standardized regression coefficients in a very important way: Whereas beta coefficients can be positive, negative, or zero, feature importances are invariably nonnegative.

These reservations having been lodged, we now summarize our quantitative findings regarding the relationship between tariff rates and their predictors:

Strongly related:

- National income per capita (log transformed) (negative)

Moderately related:

- Imports (negative)
- Corporate tax rate (positive)
- Population (log transformed) (negative)

Weakly related:

- Exports (positive)
- Consumption (positive)

No statistical significance:

- Labor force (log transformed)
- Migration (log transformed)
- Foreign direct investment

These findings support the conventional understanding of free trade and global tariff harmonization. Higher tariffs are associated with poorer countries and smaller countries. Countries willing to levy higher corporate taxes tend to favor higher tariffs.

The opposite directions of the size and corporate tax indicators suggest two possible effects, seemingly contradictory but easily reconciled. Larger economies have more opportunities for raising revenue and greater diversification of domestic economic activities. They are less dependent on tariffs as revenue and as protectors of domestic industries. The experience of African nations during trade liberalization efforts provides indirect negative support: The dependence of poorer countries on tariffs as a source of revenue can

147. See Sander Greenland, Malcolm Maclure, James J. Schlesselman, Charles Poole & Hal Morgenstern, *Standardized Regression Coefficients: A Further Critique and Review of Some Alternatives*, 2 EPIDEMIOLOGY 387, 387–89 (1991).

hinder efforts toward greater economic cooperation and downward harmonization of tariffs.¹⁴⁸

At the same time, large countries with high corporate tax rates also tend to have more comprehensive social security systems, broadly defined as programs providing income maintenance and support and collecting compulsory savings for retirement, disability, and illness.¹⁴⁹ That costly commitment nudges tariffs upward along with corporate taxes. In other words, the size of a country (whether measured economically through GDP or demographically through population) and its commitment to social support payments through the welfare state pull in opposite directions.

The absence of significant relationships with labor, migration, and foreign direct investment is also noteworthy. These are factors more closely connected to the movement of labor and (to a lesser degree) capital across national borders. Though developing nations have questioned the fairness of a world trade system devised by the world's richest nations and realistic expectations of access to wealthy markets, the politics of trade in wealthy, developed nations places greater emphasis on labor and migration.¹⁵⁰ The disruption of market structure and industrial organization *within* nations seizes political attention in richer countries in a way that potential gains from trade do not.

It therefore behooves analysis of the political economy of trade to distinguish between questions of *allocative* and *distributive* efficiency.¹⁵¹ Like so many other branches of economics, trade policy reflects this basic tension between maximizing overall welfare and more morally or emotionally contestable questions of fairness among winners and losers.¹⁵² As Ronald Coase admitted in the foundational

148. See UNECA, *supra* note 97.

149. See See GALANOS, AGIROPOULOS & POUFINAS, *supra* note *.

150. See Jim Chen, *Epiphytic Economics and the Politics of Place*, 10 MINN. J. GLOB. TRADE 1, 2, 61 (2001).

151. The canonical source on the distinction between allocative and distributive efficiency is ABBA P. LERNER, *THE ECONOMICS OF CONTROL: PRINCIPLES OF WELFARE ECONOMICS* (1944). See also Milton Friedman, *Lerner on the Economics of Control*, 55 J. POL. ECON. 405 (1947).

152. Aehyung Kim, *Decentralization and the Provision of Public Services: Framework and Implementation* 8–11 (World Bank, Policy Research Working Paper No. 4503, 2008), applies the distinction between allocative and distributive efficiency in the context of developmental economics. Jeffrey L. Harrison, *Rationalizing the Allocative/Distributive Relationship in Copyright*, 32 HOFSTRA L. REV. 853 (2004), makes an explicitly legal use of this distinction.

work of law and economics, “welfare economics must ultimately dissolve into a study of aesthetics and morals.”¹⁵³

Mindful of these intrinsic tensions and contradictions, we now apply our findings to radically different perspectives on the political economy of trade in the European Union and in the leading English-speaking trading nations of Great Britain and the United States.

B. Policy Implications for the European Union

In recommending policy for the European Union, we explore how our findings might facilitate EU tariff policy and harmonize it with other EU policies, particularly in relation to the COVID-19 pandemic. We therefore present the EU tariff policy before connecting it with an elaboration of our findings.

1. *EU Tariff Policy*

The European Union’s policy on tariffs rests on three main principles:

1. Tariffs within the EU are zero
2. There is a customs union within the EU
3. The EU also favors low tariffs and customs union with other countries

The first principle is the easiest to comprehend: Member-states of the EU face no tariffs or nontariff barriers when they trade with each other.

The second principle means that the EU applies a common external tariff to goods entering the union. Although the tariff may differ by product or country of origin, it is the same for all members of the European Union. Furthermore, as soon as goods enter the EU, individual countries impose no additional tariffs.¹⁵⁴

153. R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 43 (1960). But cf. Ken Hanly, *The Problem of Social Cost: Coase’s Economics Versus Ethics*, 9 J. APPLIED PHIL. 77, 77 (1992) (arguing that Coase “represents a classic example of the failure of many welfare economists to consider adequately the ethical implications of their recommendations”).

154. See Taxation and Customs Union, *What Is the Common Customs Tariff?*, EUR. COMM’N, https://ec.europa.eu/taxation_customs/business/calculation-customs-duties/what-is-common-customs-tariff_en [<https://perma.cc/8PFH-PUD8>] (last visited Apr. 5, 2021).

The third principle is more subtle. On one hand, the EU extends its customs union to countries that are not members of the EU. The EU has customs unions with three nonmember countries: Andorra, San Marino, and Turkey. On the other hand, the EU pursues low tariff agreements with third countries. In 2018, approximately 70% of the imports that entered the EU did so at zero tariff.¹⁵⁵

From the 1951 Treaty of Paris establishing the European Coal and Steel Community¹⁵⁶ and the 1957 Treaty of Rome establishing the European Economic Community,¹⁵⁷ the EU began as an economic union. At least initially, European unity emphasized economic interests and agreements. The EU's trade and tariff policies, though, could not remain confined to Europe. Rapid globalization and the evolution of GATT into the WTO required the EU's trade and tariff policies to engage the world at large. Indeed, the conclusion of the Uruguay Round and the signing of the Marrakesh Agreement¹⁵⁸ in 1994 roughly coincided with Europe's own Maastricht Treaty of 1992,¹⁵⁹ which removed the word "Economic" from the Treaty of Rome and committed what was then the newly named European Community to ever-closer union across a range of economic and noneconomic interests.

Under the EU's common trade policy, the European Commission negotiates trade agreements on behalf of the member states and represents their interests in the global arena. Trade policy is exclusively shaped at a central EU level and legislation is drafted collectively and not individually by each of the member states. EU member states cannot legislate or negotiate separately.

The idea of a common, centralized trade policy also prevails in American law. The United States commits trade policy and other aspects of international economic law to the federal government by

155. See Eurostat, *International Trade in Goods – Tariffs*, EUR. COMM'N, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_in_goods_-_tariffs&oldid=490749 [<https://perma.cc/HS2E-6KSV>] (last visited Apr. 5, 2021).

156. Treaty Establishing the European Coal and Steel Community, Apr. 18, 1951, 261 U.N.T.S. 140 (expired July 23, 2002).

157. Treaty Establishing the European Economic Community, Mar. 25, 1957, 298 U.N.T.S. 3, 4 Eur. Y.B. 412; see also Treaty of Lisbon Amending the Treaty on European Union and the Treaty Establishing the European Community, Dec. 13, 2007, 2007 O.J. (C306) 1, art. I, § 1 (changing the title of the EEC Treaty Establishing the European Community to the Treaty on the Functioning of the European Union).

158. Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, *supra* note 17; Marrakesh Agreement, *supra* note 77.

159. Treaty on European Union, Feb. 7, 1992, 1992 O.J. (C191) 1.

preempting state laws purporting to regulate foreign commerce.¹⁶⁰ Preemption can also displace state laws restricting certain aspects of immigration.¹⁶¹ In some circumstances, the Supreme Court has excluded states altogether from exercising exclusively federal powers over foreign affairs and international relations.¹⁶²

The member-states of the EU enjoy a customs union. A uniform set of customs duties is applied on imports from outside countries, and there are no customs duties between any two member-states. Since the formation of the internal market, goods can circulate freely between the member-states of the EU. Goods imported from third countries may be subject to duties upon initial entry. Afterward there are no additional charges or controls. Goods can move freely within the EU Customs Union. This mechanism facilitates the EU's commitment to operating a single market. Although coordination of the customs union takes place at a national level on a daily basis and the national custom services function uniformly, it is the EU that legislates and supervises implementation.¹⁶³

With respect to trade outside the EU, a Common Customs Tariff applies uniformly to goods imported from a non-EU country at the global borders of the EU. All member-states share the same tariff with nonmember countries.¹⁶⁴ The rates applied, however, may differ by the origin or type of import. The EU applies a uniform system for handling the import, export, and transit of goods and implements common rules under a Union Customs Code. Rates depend on the economic sensitivity of the goods.¹⁶⁵

160. See *Crosby v. Nat'l Foreign Trade Council*, 530 U.S. 363, 388 (2010).

161. See *Arizona v. United States*, 567 U.S. 387, 415 (2012).

162. See *Zschernig v. Miller*, 389 U.S. 429, 432 (1968).

163. See *What Is the Common Customs Tariff?*, *supra* note 154; Taxation and Customs Union, *EU Customs Union – Unique in the World*, EUR. COMM'N, https://ec.europa.eu/taxation_customs/facts-figures/eu-customs-union-unique-world_en [https://perma.cc/QP8L-KNPK] (last visited Apr. 5, 2021).

164. See generally Małgorzata Czermińska, *Tariff Safeguard Measures of the European Union Internal Market—The Role of Common Customs Tariff*, 6(10) ZESZYTY NAUKOWE POLSKIEGO TOWARZYSTWA EKONOMICZNEGO W ZIELONEJ GÓRZE 48 (2019); Tanel Kerikmäe & Sandra Särav, Article 31 [Common Customs Tariff], in *TREATY ON THE FUNCTIONING OF THE EUROPEAN UNION—A COMMENTARY* 719 (Hermann-Josef Blanke & Stelio Mangiameli Stelio eds., 2021).

165. See generally Małgorzata Czermińska, *The European Union Customs System in the 21st Century—Challenges and Trends*, 8 TRENDS IN THE WORLD ECON. 39 (2016); Carsten Weerth, *Customs Sanctions of the EU-27: A Detailed Analysis and a Preview on the Modernized Customs Code of the EU and the European Union Customs Code*, 8 GLOBAL TRADE & CUSTOMS J. 42 (2013).

The concept of tariff at an EU level is a collection of laws. It is the name given to the combination of the class (nomenclature) and the applicable rates for each class of goods, based on relevant legislation setting the level of duties charged by country or territory of origin. The tariff aims at providing European producers with fair and equal conditions in the internal market vis-à-vis non-EU exporters to the EU.¹⁶⁶ TARIC, the integrated Tariff of the EU, is a multilingual database that integrates all metrics relevant to the EU customs tariff and to commercial and agricultural legislation in the EU.¹⁶⁷

The EU pursues agreements with other countries with the objective of lifting the potential barriers to trade. The EU seeks commitments that (1) lift or reduce potential customs duties/taxes on goods; (2) eliminate potential limits and quotas on the exported quantities; (3) facilitate companies to offer services and participate in public contract tenders; and (4) reduce excessive regulation to ease exports.

The European Commission enters negotiations either as a member of the WTO or directly through countries and regions. Even as it follows global rules, the Commission seeks improvements so that trade flows uninterrupted, freely, and predictably. As a result, different trade regimes may govern different products and countries of origin. Nevertheless, the most-favored nation (MFN) principle governs the primary trade regime under the auspices of the WTO and provides nondiscriminatory tariff charges by default. Preferential agreements could coexist within a framework of customs unions or free trade areas, with lower rates or even zero tariffs.

As a result of EU trade agreements, approximately 70% of EU imports had zero tariffs in 2018. Such agreements enable enterprises in the EU to withstand competition and export beyond the EU. Furthermore, EU firms can more effectively import raw materials and other vital components from foreign markets.¹⁶⁸

Finally, linkage within EU trade policy confers societal and environmental benefits. Non-EU governments that enter trade agreements with the EU may be required to uphold labor and human rights and to protect the environment. For its part, the EU can reduce

166. See *What Is the Common Customs Tariff?*, *supra* note 154; *EU Customs Union – Unique in the World*, *supra* note 163.

167. See Taxation and Customs Union, *TARIC*, EUR. COMM'N, https://ec.europa.eu/taxation_customs/business/calculation-customs-duties/what-is-common-customs-tariff/taric_en [<https://perma.cc/DX6Q-3EPZ>] (last visited Apr. 5, 2021).

168. See Eurostat, *supra* note 155.

costs related to nontariff barriers without retreating on environmental or human health.

The EU has pursued various negotiations with non-EU countries, such as the United States, China, Japan, Singapore, and South Korea. It is now the largest trading bloc in the world, reaching over 15% of world trade. In 2019, its external trade value reached 4.09 trillion euros, half with five countries: the United States, China, Switzerland, Russia, and Turkey.¹⁶⁹

2. Economic and Demographic Policy Recommendations for Europe

This Article has found evidence that tariffs exhibit statistically significant correlation (with a positive or negative sign indicated in parentheses) with national income per capita (–), exports (+), consumption (+), imports (–), population (–), and the corporate tax rate (+). Foreign direct investment, labor force, and migration showed no statistical significance. We now ask how these findings can inform EU policies to advance the European interest in low or zero tariffs. Cognizant that tariffs are sources of income for the EU and its member-states, we realize that reducing tariffs would require a higher volume of taxable trade or alternative, offsetting sources of revenue.

If we assume that the intention is to secure trade agreements with zero or low tariffs and a customs union wherever possible, then exports, imports, consumption, and corporate taxation should not matter. These variables are unbundled from tariffs, as long as the EU enters a customs union or enhanced trade agreement with its trading partners. Statistically significant variables that could affect tariffs are income per capita and population. Consequently, policies congruent with zero or low tariffs and a customs union should seek to increase income and population.

The natural question is how. One policy change would seek to increase of income per capita. Increased income likely raises revenue and reduces dependence on tariffs. Indeed, there are few economic ailments beyond the restorative powers of increased income. Raising gross domestic income amid a pandemic does seem challenging.

As one path forward, the EU has proposed the Green Deal, a rescue package of 750 billion euros aimed at sparking a green and digital transformation. The proposal targets small and medium enterprises (SMEs) as the backbone of EU economies. Increasing the

169. See *EU Customs Union – Unique in the World*, *supra* note 163.

income of SME owners and employees will promote long-term sustainable growth and reduce revenue dependency on tariffs.

The EU could also try to increase its population. The justification is similar: A population increase widens the tax base and boosts the flow of tax revenues. Again, it is easier to describe this policy than to achieve it. Increasing the population is no less challenging than increasing income. The EU could either incentivize family creation and childbirth or integrate a larger number of migrants and refugees.

We hasten to note, however, that the link between migration and tariffs is not statistically significant. Fertility and migration policies are not mutually exclusive. In all events, the EU needs to continue acting in unison and not country by country, so that uniform solutions are implemented.

The EU Green Deal lies at the very center of the European Recovery Strategy from the pandemic.¹⁷⁰ It directs new money toward investments that would (1) support EU member-states with their own investments and reforms; (2) stimulate the EU economy by incentivizing private investments; and (3) incorporate lessons learned from the crisis. A sizable tranche of the Next Generation EU fund, 750 billion euros, will promote a green transition by member-states and resident enterprises, promoting climate neutrality, rural area support, structural changes toward a greener economy, and biodiversity conservation.

The Green Deal's key components include a Climate Law that commits the EU to carbon neutrality by 2050. Other important components are strategies and actions that aim to provide clean, affordable, and secure energy, biodiversity, zero pollution, a circular economy, and sustainable food production.

To meet these goals, the Green Deal proposes financial and economic reforms in the public and private sectors: (1) the Sustainable Europe Investment Plan and (2) the Renewed Strategy on Sustainable Finance.¹⁷¹ The economic reforms focus on (1) the rapid decarbonization of energy systems; (2) innovation in sustainable

170. See Rudolf Staudigl, *Green Recovery Mit Einem Konstruktiven Green Deal der EU: Jetzt Die Weichen Für Eine Nachhaltige Produktion in Europa Stellen*, VIK MITTEILUNGEN 28 (2020); see also Rudolf Staudigl, *#GreenRecovery Now Is the Time to Set Europe on a Course for Sustainable Production!*, WACKER, <https://www.wacker.com/cms/en-us/about-wacker/sustainability/greenrecovery/greenrecovery.html> (last visited Apr. 5, 2021) (providing an English-language summary).

171. See EUR. COMM'N, TAXONOMY: FINAL REPORT OF THE TECHNICAL EXPERT GROUP ON SUSTAINABLE FINANCE 9 (2020).

energy; (3) the large-scale renovation of existing buildings; (4) the development of cleaner public and private transport; and (5) progress towards sustainable food systems.

To deliver aid to investors, companies, issuers, and project promoters and to advance the transition to a low-carbon, resilient, and resource-efficient economy, the EU has set up a Technical Expert Group. The EU Taxonomy sets performance thresholds, called “technical screening criteria,” applicable to economic activities which:¹⁷²

- Make a substantial contribution to one of six environmental objectives:
 - Climate change mitigation
 - Climate change adaptation
 - Sustainable and protection of water and marine resources
 - Transition to a circular economy
 - Pollution prevention and control
 - Protection and restoration of biodiversity and ecosystems
- Do no significant harm (DNSH) to the other five objectives (where relevant)
- Meet minimum safeguards, such as the OECD Guidelines on Multinational Enterprises and the UN Guiding Principles on Business and Human Rights

These thresholds are expected to help all stakeholders gain access to green financing. Consequently, low carbon sectors are expected to grow, whereas high-carbon sectors are anticipated to shrink or decarbonize.¹⁷³ The EU Green Deal and the EU Taxonomy share the same environmental objectives. They both favor sustainable finance and are expected to affect investors and issuers.

The EU Green Deal grants even more privileges to certain fields, such as sustainable food production, rural area development, and energy. Funds directed to these companies, as well as issuers wishing to back them, should increase firm revenues, as well as employees’ incomes. If these investments are efficient, national income per capita should increase.

172. *Id.* See generally THOMAS POUFINAS, FIXED INCOME INVESTING: AN ALL-TIME CLASSIC IN TIMES OF INCREASED UNCERTAINTY (forthcoming 2021).

173. See EUR. COMM’N, *supra* note 171.

Population policies depend on individual member-states of the EU. Most countries have their own incentives for tackling demographic challenges; the EU seems to lack a common, integrated policy. At most the European Commission can make nonbinding recommendations. Policies that can be collectively pursued synthesize the measures that individual member-states have implemented.

One possible measure comprises financial incentives through cash transfers or tax reductions. Cash transfers may take the form of a birth bonus for each child, plus an ongoing allowance until the child reaches a certain age. Tax reductions may benefit families according to the number and ages of their children. Another measure consists of parental leave, or time off work when a child is born, or soon thereafter. Parental leave may extend to a number of years. A third potential measure is publicly subsidized or provided childcare, which allows parents to continue working.

Other measures could address gender equality, so that burden of household and childcare work does not disproportionately burden women. Furthermore, a healthier work-life balance could enable women to have more children if they so choose. Other work-related measures include part-time work, flexible working hours, and work from home. All of these measures reconcile parenthood with professional life. Finally, affordable housing would benefit younger people during their peak reproductive years.

If the EU genuinely seeks population growth, it may need comprehensive, consistent, and coordinated policies in all member-states with respect to economic and social measures affecting family formation and fertility. A stable, less volatile policy framework might spur higher reproductive rates.¹⁷⁴

The EU, however, is fighting a global trend of chronic population decline in industrialized economies. Since the 1980s, European demographers have noted the continent's decline in fertility below replacement level.¹⁷⁵ Long-term trends favoring higher levels of education for women and lower numbers of births per woman all but inevitably consign most of Europe to long-term declines in

174. See Ron Davies, *Library Briefing: Promoting Fertility in the EU: Social Policy Options for Member States*, LIBR. OF THE EUR. PARLIAMENT (May 21, 2013).

175. See Philippe Ariès, *Two Successive Motivations for the Declining Birth Rate in the West*, 6 POPULATION & DEV. REV. 645, 645 (1980). See generally Ron Lesthaeghe & Dominique Meeker, *Value Changes and the Dimensions of Familism in the European Community*, 2 EUR. J. POPULATION 225 (1986).

population.¹⁷⁶ The American variant of the Second Demographic Transition is associated with the stark economic and political chasms dividing the United States, as ambitious, upwardly mobile women flee depressed regions for higher education and superior economic prospects in larger cities.¹⁷⁷ The rise and flight of the creative class in all developed economies depend upon this demographic shift.¹⁷⁸

Meanwhile, the EU faces acute financial shortfalls in managing its social security programs. Demographic decline stalks the Union's pensions and retirement accounts. Since the 2015 migration crisis, the EU has received dramatically increased population inflows from nonmember states. Currently, 21.8 million non-EU nationals live in the EU, constituting 5% of its total population. Europe must not only address arrivals through an effective, humanitarian, and safe migration policy, but it must also secure the appropriate integration of refugees and migrants.

EU policies for managing lawful migration address (1) asylum seekers, (2) highly skilled workers, (3) students and researchers, (4) seasonal workers, (5) intracorporate transfers, and (6) family reunification. Europe has also implemented common rules for processing asylum requests and readmission agreements for repatriating illegal migrants. The European Commission's priorities for integration address (1) predeparture and prearrival measures, (2) education, (3) labor market integration and access to vocational training, (4) access to basic services, and (5) active participation and social inclusion. The EU has also employed tools to support these

176. See Ron Lesthaeghe & Dirk J. van de Kaa, *Twee Demografische Transitie*, in BEVOLKING: GROEI EN KRIMP 9 (Dirk J. van de Kaa & Ron Lesthaeghe eds., 1986); Dirk J. van de Kaa, *Europe's Second Demographic Transition*, 42 POPULATION BULL. 1, 5–7 (1987).

177. See, e.g., Ron Lesthaeghe, *The Second Demographic Transition: A Concise Overview of Its Development*, 111 PNAS 18,112, 18,115 (2014); Ron Lesthaeghe, *The Unfolding Story of the Second Demographic Transition*, 36 POPULATION & DEV. REV. 211, 211–12 (2010); Ron J. Lesthaeghe & Lisa Neidert, *The Second Demographic Transition in the United States: Exception or Textbook Example?*, 32 POPULATION & DEV. REV. 669, 669–72 (2006); Ron Lesthaeghe & Lisa Neidert, *U.S. Presidential Elections and the Spatial Pattern of the American Second Demographic Transition*, 35 POPULATION & DEV. REV. 391, 399–400 (2009); cf. Myra Marx Ferree, *The Crisis of Masculinity for Gendered Democracies: Before, During, and After Trump*, 35 SOCIO. F. 898, 898 (2020).

178. See generally RICHARD FLORIDA, *THE RISE OF THE CREATIVE CLASS* (2002); RICHARD FLORIDA, *THE FLIGHT OF THE CREATIVE CLASS: THE NEW GLOBAL COMPETITION FOR TALENT* (2007).

integration policy priorities pertaining to (1) policy coordination and (2) adequate funding support.¹⁷⁹

Depending upon fertility and mortality rates, immigration can play a role in shaping the demographics of the EU.¹⁸⁰ In addition to solving the problem analytically through biostatistics and actuarial mathematics, the EU must also develop the appropriate framework for a potential solution through concrete fieldwork.

The EU has the policy tools to achieve its preferred level of tariffs. Assuming that the EU wants a low-tariff regime, it can (1) increase income through its Green Deal and (2) increase its population by introducing uniform policies that encourage family formation and by admitting and integrating more migrants.

C. Policy Implications for Great Britain and the United States

The policy recommendations in Subsection IV.B.2 presuppose that European voters would embrace a battery of policies promoting a Green New Deal, increased fertility, higher levels of immigration, and a continued commitment to robust global trade. Whether European politicians could plausibly enact that package without ending their careers in public service remains shrouded in mystery.

What can be said with greater certainty is that a substantial plurality of voters in Great Britain and the United States regards the trinity of trade, environmental protection, and immigration as anathema. Faced with the prospect that such a package could become law, a dangerous fraction of American voters might even resort to political violence. At an absolute minimum, American law recognizes that any suggestion that taxpayers finance education or any other benefit for other people's children is often doomed to political failure.¹⁸¹

179. See Eur. Comm'n, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Action Plan on the Integration of Third Country Nationals (2016).

180. See generally WOLFGANG LUTZ & SERGEI SCHERBOV, CAN IMMIGRATION COMPENSATE FOR EUROPE'S LOW FERTILITY?, IIASA INTERIM REPORT (2002); WOLFGANG LUTZ & SERGEI SCHERBOV, THE CONTRIBUTION OF MIGRATION TO EUROPE'S DEMOGRAPHIC FUTURE: PROJECTIONS FOR THE EU-25 TO 2050, IIASA INTERIM REPORT (2007).

181. See *San Antonio Indep. Sch. Dist. v. Rodriguez*, 411 U.S. 1, 54–55 (1973) (“[T]o the extent that the Texas system of school financing results in unequal expenditures between children, who happen to reside in different districts, we cannot

Aided in considerable part by the legal and electoral peculiarities of their respective countries, British and American voters unleashed the great backlash of 2016 against the liberal world order whose economic pillars were erected in Bretton Woods after World War II and in Uruguay and Marrakesh after the Cold War. In retrospect, Brexit and the election of Donald Trump were more consequential protests against that liberal order than the left-leaning protests of the “Battle in Seattle”¹⁸² or “Occupy Wall Street.”¹⁸³

Part of this alignment’s potency stems from its appeal to right-of-center voters, a constituency outnumbering the left by considerable margins, especially in the United States. America, after all, is home to an “energetic and articulate” culture that has long championed capitalism over socialism with “remarkable” intensity.¹⁸⁴ At a minimum, American conservatism exploits the disproportionate power that constitutional institutions such as the Senate and the Electoral College confer upon rural voters.

But the political potency of the Anglo-American uprising of 2016 also stems from a deeper cultural affinity connecting the English-speaking world. Sources in Europe, Britain, and America have historically treated the Anglophone hegemons as the most fearsome powers in a globe-spanning “Anglo-Saxon” polity.¹⁸⁵ “In a very real

say that such disparities are the product of a system that is so irrational as to be invidiously discriminatory.”).

182. See, e.g., Stephen Gill, *Toward a Postmodern Prince? The Battle in Seattle as a Moment in the New Politics of Globalisation*, 29 MILLENNIUM: J. INT’L STUD. 131, *passim* (2000); Clyde Summers, *The Battle in Seattle: Free Trade, Labor Rights, and Societal Values*, 22 U. PA. J. INT’L ECON. L. 61, 61–63 (2001).

183. See generally, e.g., Craig Calhoun, *Occupy Wall Street in Perspective*. 64 BRIT. J. SOCIO. 26 (2013); John L. Hammond, *The Significance of Space in Occupy Wall Street*, 5 INTERFACE 499 (2013).

184. JOHN KENNETH GALBRAITH, *ECONOMICS AND THE ART OF CONTROVERSY* 33 (1955).

185. See, e.g., George Burton Adams, *The United States and the Anglo-Saxon Future*, ATLANTIC (July 1896), <https://www.theatlantic.com/magazine/archive/1896/07/the-united-states-and-the-anglo-saxon-future/525690> [<https://perma.cc/R2GV-DA56>] (“By judicious action, in the right way and at the right time, we may assume for ourselves that position of leadership in organization which England hesitates to take, and thus to make the world-empire of the Anglo-Saxon a certainty.”). See generally, e.g., OTFRIED HÖFFE, *L’ÉTAT ET LA JUSTICE: LES PROBLÈMES ÉTHIQUES ET POLITIQUES DANS LA PHILOSOPHIE ANGLO-SAXONNE* JOHN RAWLS ET ROBERT NOZICK (1988); J.M. ROBERTS & O.A. WESTAD, *Political Change: The Anglo-Saxon World*, in *THE HISTORY OF THE WORLD 770* (6th ed. 2013), translated as JOHN M. ROBERTS & ODD ARNE WESTAD, 3 HISTOIRE DU MONDE: L’ÂGE DES RÉVOLUTIONS 113 (Jacques Bersani trans., Perrin 2019); Frederick G. Detweiler, *The Anglo-Saxon Myth in the United States*, 3 AM. SOCIO. REV. 183 (1938).

sense,” the Anglo-American uprising of 2016 was decades behind its time: “it could more appropriately have” happened thirty-two years earlier, “in 1984, a year coinciding with the title of a book” with which that episode shares, “perhaps subconsciously, at least one idea.”¹⁸⁶ George Orwell’s celebrated “splitting-up of the world into three great super-states,” with a sharp division between continental Europe and an entity called “Oceania” that “comprises the Americas, the Atlantic islands including the British Isles, Australasia, and the southern portion of Africa,” informs this Article’s separate treatment of the European Union and the Anglo-Saxon polities of Great Britain and the United States.¹⁸⁷

This long prologue leads at last to policy prescriptions for Britain and America. Recall that our conventional and machine-learning models found no statistically significant relationship between tariff levels and labor, migration, and foreign direct investment. Unlike the demographic and macroeconomic factors that dominated our discussion of EU policy in Subsection IV.B.2, immigration and the size of a nation’s labor force are more intimately connected to the movement of labor and (to a lesser degree) capital across national borders than to strictly domestic conditions. In a play on the year of America’s Declaration of Independence, we may call these factors the “spirit of 2016.”

For advocates of the political order associated with Bretton Woods,¹⁸⁸ 2016 was the *annus horribilis* of Brexit and Trump.¹⁸⁹ Both of these political uprisings are widely attributed to anxiety about the loss of domestic employment and white cultural hegemony to immigration. The contribution of race and racism to the decisive role of immigration in Brexit and the election of Trump remains fiercely contested.¹⁹⁰ If tariffs are considered part of the policy toolkit against

186. United Steelworkers of Am. v. Weber, 443 U.S. 193, 219 (1979) (Rehnquist, J., dissenting).

187. GEORGE ORWELL, NINETEEN EIGHTY-FOUR 152–53 (New Am. Libr. 1983) (1949).

188. See generally sources cited *supra* note 63.

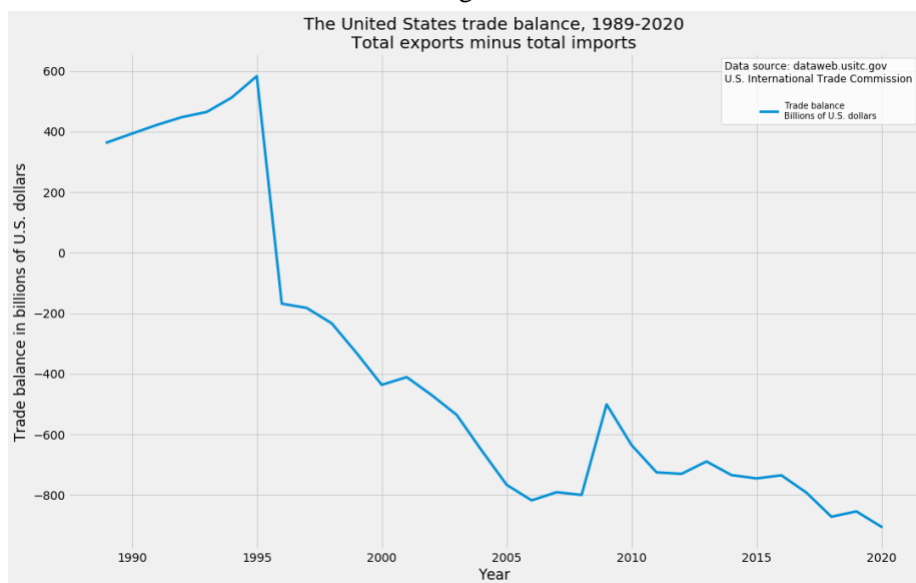
189. Cf. M.D.A. Freeman, *Annual Survey of Family Law 1992 England: 1992 as Annus Horribilis*, 32 U. LOUISVILLE J. FAM. L. 293, 293 (1993–94) (“As is well-known, the Queen described 1992 as her ‘annus horribilis.’”).

190. As to race, immigration, and Trump support, see Marc Hooghe & Ruth Dassonneville, *Explaining the Trump Vote: The Effect of Racist Resentment and Anti-Immigrant Sentiments*, 51 PS: POL. SCI. & POL. 528, 532 (2018); Jolanda Jetten, *The Wealth Paradox: Prosperity and Opposition to Immigration*, 49 EUR. J. SOC. PSYCH. 1097, 1097–98, 1101 (2019); Tyler T. Reny, Loren Collingwood & Ali A. Valenzuela, *Vote Switching in the 2016 Election: How Racial and Immigration Attitudes, Not*

the erosion of domestic labor markets, they appear to be quite powerless. Tariffs do not even appear to be effective in suppressing consumption, since higher tariffs show a weakly or mildly positive correlation with consumption.

Evidence from the United States International Trade Commission suggests that neither tariffs nor any other policy instrument has come close to matching the Uruguay Round and the Marrakesh Agreement in influencing the American trade balance. The following figure shows how the trade balance of the United States dropped precipitously after accession to the WTO and has continued to decline since 1996. The most salient exception to this otherwise steady downward trend came during the Great Recession of 2008–2009. Whatever the impact of Trump-era policies, they did not reverse the ongoing tendency of Americans to import more than they export:

Figure 7:



Data from <https://dataweb.usitc.gov>, as wrangled and visualized in Python by the authors

Economics, Explain Shifts in White Voting, 83 PUB. OP. Q. 91, 109–10 (2019). Sources describing the impact of attitudes toward race and immigration on Brexit include Matthew Goodwin & Caitlin Milazzo, *Taking Back Control? Investigating the Role of Immigration in the 2016 Vote for Brexit*, 19 BRIT. J. POL. & INT'L RELS. 450 (2017); Sara B. Hobolt, *The Brexit Vote: A Divided Nation, A Divided Continent*, 23 J. EUR. PUB. POL'Y 1259 (2016); Eric Kaufmann, *Can Narratives of White Identity Reduce Opposition to Immigration and Support for Hard Brexit? A Survey Experiment*, 67 POL. STUD. 31 (2019).

The apparent impotence of tariffs in shaping domestic labor markets, the balance of trade, and domestic policy in general carries special resonance in the United States. Born in the conviction that “the power to tax involves the power to destroy,”¹⁹¹ American law looks askance upon explicitly regulatory applications of taxation, as distinct from the imposition of taxes to raise government revenue.¹⁹²

Even if such overt acknowledgement of taxation’s instrumental potential offends the rhetorical sensibilities of American law, the redistributive and structural uses of taxation—including the imposition of tariffs on imports—have always rivaled if not eclipsed taxation’s putatively primary purpose as a source of revenue. In international as well as domestic settings, the “primary, intended, real effect of any . . . tax is to curtail some part of . . . private consumption of economic resources . . . in order to free those resources for public use, including redistribution to the poor.”¹⁹³

The absence of statistically significant relationships between tariff levels and labor-specific variables such as the size of the labor force and immigration levels suggests that the surveyed nations fail to wield tariffs in response to the free movement of labor. Whatever the socioeconomic and political fears raised by that phenomenon, not even Brexit or the election of Trump has spurred changes in tariff levels that warrant attention, statistically speaking, in either direction. Alternatively, to the extent that nations do attempt to use tariffs as a policy tool in response to labor force disruptions, especially those associated with immigration, both Britain and America appear to have abjectly failed.

Indeed, the Anglo-Saxon spasm of 2016 may have achieved nothing of value for Britain or the United States. These nations’ flirtation with autarky, even anarchy, grew out of populist impatience with the domestic distributive impacts of liberalized trade policy. The end of Britain’s participation in the grander European project of ever closer union has now created a true international land border with the Republic of Ireland. With no small measure of irony, a vote rooted in the mirage of national sovereignty may do more than a century of troubles to drive the Protestant counties of the North into union with the Catholic counties of the South. An even deeper partition of the

191. *McCulloch v. Maryland*, 17 U.S. (4 Wheat.) 316, 431 (1819).

192. *See, e.g., United States v. Butler*, 297 U.S. 1, 63–64 (1936); *United States v. Kahriger*, 345 U.S. 22, 29–31 (1953).

193. William D. Andrews, *A Consumption-Type or Cash Flow Personal Income Tax*, 87 HARV. L. REV. 1113, 1165 (1974).

United Kingdom awaits, if Scottish nationalists succeed in converting dissatisfaction with Brexit and a longing to return to the EU as the springboard for a plebiscite that could end Scotland's union with the England and Wales.

At an absolute minimum, Britain has betrayed its intellectual roots. Two centuries ago, the debate between David Ricardo and Thomas Malthus over the protectionist Corn Laws of the Napoleonic wars set the course of economic science for the balance of the nineteenth century.¹⁹⁴ *Pax Britannica*, enabled in no small part by Adam Smith's demolition of mercantilism, has emphatically ended with an incoherent demand for deliverance from the European project.

The self-immolation of the United States since 2016 is even more astonishing. The Bretton Woods regime, including WTO's assumption of GATT's central position in the world trade system, was the conscious, deliberate creation of the United States as one of America's leading tools of foreign policy against the defeated threat of Nazism and the emerging menace of Soviet-led communism. The sacrifice of American global leadership at the altar of Trumpian unilateralism yielded no discernible change in the United States' balance of trade.

The United States Constitution, though buffeted mightily since 2016, was the original North American free trade agreement. It created a "common market" rooted in the "economic interdependence of the States."¹⁹⁵ On the mere strength of a judicial doctrine, presumably but rarely subject to supersedure by congressional legislation, the United States has historically guaranteed "every farmer and every craftsman . . . the certainty" of "free access to every market in the Nation" and an accompanying freedom from "home embargoes" against exports and from "custom duties or regulations" imposed by a "foreign [S]tate."¹⁹⁶ Despite calls to the contrary by some Justices,¹⁹⁷ the

194. See Robert Dorfman, *Thomas Robert Malthus and David Ricardo*, 3 J. ECON. PERSP., 157–60 (1989).

195. *Hunt v. Wash. State Apple Advert. Comm'n*, 432 U.S. 333, 350 (1977); *accord* *World-Wide Volkswagen Corp. v. Woodson*, 444 U.S. 286, 293 (1980); *C & A Carbone, Inc. v. Clarkstown*, 511 U.S. 383, 423 (1994) (Souter, J., dissenting) (quoting *Hunt*, 432 U.S. at 350).

196. *H.P. Hood & Sons, Inc. v. Du Mond*, 336 U.S. 525, 539 (1949); *accord* *General Motors Corp. v. Tracy*, 519 U.S. 278, 299–300 (1997) (quoting *H.P. Hood & Sons*, 336 U.S. at 539).

197. See, e.g., *Camps Newfound/Owatonna, Inc. v. Harrison*, 520 U.S. 564, 609 (1997) (Thomas, J., dissenting) ("This move works a significant, unwarranted, and, in my view, improvident expansion in our 'dormant' or 'negative,' Commerce Clause jurisprudence.").

Supreme Court has vigilantly protected “the common market created by the Framers of the Constitution” against retaliation and misplaced calls for reciprocity among individual states.¹⁹⁸

Yet the United States spent an entire presidential administration blustering or bluffing over its purported displeasure with the WTO, an international agency created according to an American blueprint where membership, for nearly any other country, signals acceptance and credibility in the global economic community. If only this crisis could be blamed on a misbegotten revival of mercantilism. In the uncertainty between population and migration, in the tension between international trade and domestic labor, in the uneasy distance between demographic decline and economic inequality—all carrying significance articulable in emotional as well as statistical terms—lurks a far darker, more ominous interpretation of the denaturing spirits of Brexit and Trump.

CONCLUSION

This Article has combined two approaches to empirical social science with legal and policy prescriptions. With respect to economic analysis, we have sought to harmonize machine learning with generalized linear models. Our results invited contrasting policy recommendations for the European Union, Great Britain, and the United States, three trading blocs with varying degrees of political union and social cohesion.

This Article’s empirical findings align comfortably with much of the theoretical literature on the political economy of tariffs as the primary tools for taxing and restraining international trade. The anti-mercantilist heralds of classical economics, Adam Smith and David Ricardo, correctly attributed the wealth of nations to the free movement of goods, services, and labor.¹⁹⁹ Liberalized trade through lower tariffs is associated with increased wealth. Tariffs diminish in economic and political prominence as economies grow and diversify. Reliance on tariffs as a source of revenue may correlate positively with corporate tax rates and support for the welfare state, in direct contradiction of American policy preferences associated with the administration of Donald Trump.

To the extent that the intended beneficiaries of tariffs are domestic victims of globalization and trade liberalization, our research

198. *Great Atl. & Pac. Tea Co. v. Cottrell*, 424 U.S. 366, 380 (1976).

199. *See* RICARDO, *supra* note *; SMITH, *supra* note *.

has unearthed no empirical evidence suggesting that tariffs have succeeded (or failed) in attaining this policy objective.²⁰⁰ At the least, the absence of conclusive evidence is not inconsistent with one of the most important theoretical insights about the political economy of global trade policy. International trade agreements allow governments to exploit lobbying pressures by vulnerable industries and other domestic interests for short-term political gain, even as those governments harvest long-run economic gains from interactions with free trade, ranging from vague commitments to formal accession in the World Trade Organization or in regional arrangements such as the European Union.²⁰¹

In the grand sweep of history, the law of global trade and the legacy of the Bretton Woods system represent the civilized order's long, ambitious, and fiercely embattled response to two cataclysmic world wars and another half-century of antagonism pitting the capitalist west against the communist east and the wealthy north against the impoverished south. The most dedicated enemies of this regime, however, do not lurk as barbarians at the gate. Rather, the greatest threats to global trade law and international economic cooperation lurk within the domestic political systems of the great powers. No less than the world wars and their resolution, clashes over tariffs and trade policy pit "the cynical traditions of ... power politics" against "the promise of a more enlightened order."²⁰²

200. See generally Jim Chen, *Globalization and Its Losers*, 9 MINN. J. GLOB. TRADE 157 (2000).

201. See Giovanni Maggi & Andres Rodriguez-Clare, *The Value of Trade Agreements in the Presence of Political Pressures*, 106 J. POL. ECON. 574, 592–95 (1998).

202. DAVID STEVENSON, CATAclysm: THE FIRST WORLD WAR AS POLITICAL TRAGEDY 417 (2004). See generally KEYNES, THE ECONOMIC CONSEQUENCES OF THE PEACE, *supra* note 24.