Online Appendix for "The Political Economy of Industrial Policy"

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A. Data construction

Figures 1-3 in the main text are constructed using the industrial policy dataset of Juhász et al. 2022 (henceforth JLOP). This dataset was constructed using the Global Trade Alert (GTA), and it covers the years 2009-2023. Each observation in the GTA is a ``credible announcement of a meaningful and unilateral change in the relative treatment of foreign versus domestic commercial interests" (p. 1 Evenett and Fritz, 2022). JLOP develop a supervised machine learning workflow to classify policies as industrial policy. In this paper, we take the policies identified by JLOP as industrial policy according to the three-class BERT large language model.

We restrict the sample to the Group of Twenty countries. These include Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Republic of Korea, Russia, Saudi Arabia, South Africa, Turkey, United Kingdom, United States of America.[1]

We now describe the construction of the variables used in this paper: green industrial policy and autonomous public entities that deploy industrial policy.

A.1. Green industrial policy

We define green industrial policy as the subset of industrial policies that promote decarbonization. Decarbonization means reducing the amount of greenhouse gas emitted and increasing the amount absorbed (The Climate Dictionary, 2023). We note that while this definition is used in the literature (e.g., Karp and Stevenson, 2012; Schmitz et al., 2015), there are other possible definitions of green industrial policy. In particular, other scholars define green industrial policies as those that promote "green" sectors or technologies (Alternburg and Rodrik 2017; Criscuolo et al. 2022; Lütkenhorst et al. 2016; Harrison et al. 2017). These two definitions of industrial policy are slightly different. Decarbonization is narrower than "green" in that it does not include activities that are related to the environment but that do not reduce emissions such as

[1] While the European Union is also part of the Group of Twenty, we exclude it from our analysis, and focus only on the countries themselves.

promoting biodiversity. However, decarbonization is broader in that it includes activities that reduce emissions even if they have other environmental consequences such as hydroelectric dams and nuclear power plants. We chose the decarbonization concept of green industrial policy given our interest in understanding climate policies.

To implement our definition of green industrial policies we take the set of industrial policies from JLOP and identify those that are "green" using a dictionary-based approach. Specifically, we classify a policy as green if the text of the policy contains at least one of the following strings:

> "decarbon" "low carbon" "carbon neutral" "net zero" "renewable" "alternative energy" "clean energy" "clean energies" " emission" "energy efficiency" "energy efficient" "energy consumption" "energy conservation" "energy saving" "fuel consumption" "green energy" " wind " "windpark" "windfarm" "solar" "photovoltaic" "biomass" "biogas" "biofuel" "bioethanol" " hydro " "hydropower" "hydroelectric" "geothermal" "nuclear energy" "hydrogen fuel" "green hydrogen" "electric vehicle" "electric drive" "charging station" "fuel cell" "carbon capture" "sequest"

A string is a sequence of characters. It is important to note that the dictionary contains strings rather than words or phrases. The strings are not words as some strings contain more than one word that must appear in sequence. The strings are not phrases either as some strings specify that a blank space must appear at the start before or after the phrase. " hydro " is an example.

To illustrate the word search approach, consider the following policy. In this policy, Brazil's national development bank (BNDES) gives a loan to finance two bioethanol plants. Bioethanol is a kind of biofuel produced from fermenting sugar. This policy has the following description in the GTA data (we highlight strings from the green IP dictionary in green).

> "on 15 january 2021 the bndes announced the approval of a loan of brl 9416 million (ca usd 1778 million) to support the expansion of several projects managed by s o martinho group the objective of the resources is to finance the expansion of two bioethanol plants in the case of usina boa vista the project contemplates the construction of a corn ethanol plant whereas in the ute s o mar- tinho bioenergia the investment will focus in the construction of a thermoelectric plant that will use sugar wastes as the fuel notably the resources allocated by the bndes represent 79% of the total project investment according to petr nio can ado director of credit and guarantees of the bndes "support for s o martinhos projects meets the demands of brazilian society such as decarbonisation of the economy care for the environment and incentives to improve productivity through innovation combined with the generation of jobs and income from the productive activities of the sugar energy sector"

In practice (as can be seen in the example above), we preprocess the text by removing punctuation and converting all text to lowercase. We then search for the strings in our dictionary using two string variables provided by the GTA; the “State Act Title” (which is the name of the policy), and the “Measure Description” (which is the description of the policy as provided by the GTA). An example of the latter is shown above.

A.2. Autonomous public entities that deploy industrial policy

In this section, we first describe how we identify the public entities that deploy industrial policy, and then we show how we classify them as autonomous.

Identifying public entities – We use OpenAI's ChatGPT to extract "entities"—organizations administering and deploying industrial policy—from textual descriptions of industrial policy. Our workflow is algorithmic and uses ChatGPT's API (Application Programming Interface) for a specialized task: extracting industrial policy institutions and country references from unstructured text. This workflow is implemented in Python and was executed in November 2023.

Specifically, we extract industrial policy entities using ChatGPT 3.5 (GPT-3.5-turbo-0613), which we fine-tuned to identify entities and country names from textual policy summaries of industrial policies in JLOP. The workflow can be summarized as follows: First, we select test and training samples from the JLOP dataset. Second, we develop a custom prompt that instructs ChatGPT on how to mine administrative entities from the policy text; we integrate this prompt and provide expected replies into the training data sample. Thus, this labeled training data specifies how ChatGPT should extract entities and the expected output.

Third, the processed training data is used to fine-tune the baseline GPT-3.5-turbo-0613 model, which is done through the OpenAI API. Labeled data is fed into a fine-tuning pipeline, which updates the baseline model's weights to handle the custom entity extraction task. This process helps the model learn how to extract the appropriate entities. Fourth, the workflow evaluates and validates the fine-tuned model using the test sample.

Finally, we deploy the fine-tuned model to extract industrial policy entities from the entire JLOP dataset. The extracted entities are then processed, cleaned, and validated by hand. This workflow generates a comprehensive dataset of industrial policy entities for industrial policy in the JLOP data.

Classifying public entities as autonomous – We categorize the entities in the JLOP data as political or autonomous according to the Bureaucrat or Politician (BoP) method developed by Field (2024). The author categorizes entities as political when their leaders are politicians or have salient political ties, and autonomous otherwise.[2]

Some organizations have one clear leader. Governor, director general and comptroller are common titles for this leader. If this leader is a politician, the BoP method classes the organization as political. If this leader is not a politician, the BoP method classes the organization as autonomous.

Other organizations have a corporate leadership structure with both a CEO in charge of day-to-day operations and a chair of the supervisory board. The BoP method classes the organization as political if either leader is a politician and autonomous otherwise.

An individual is a politician if they hold a political position or are affiliated with a political party. Political positions include cabinet minister, national legislature member, roles in regional government and political party governance. We use information from the organization's website, job platforms, news websites and informative sites such as Wikipedia in that order of preference.

The BoP method classifies an individual as a non-politician if scouring an individual's CV, listed experience and appearances in internet searches reveals no evidence of them being a politician.

We now discuss how we classified the public entities discussed in the paper using the BoP method. Here, we simply state the leadership structure and focus on the classification of the leader(s) as politicians or non-politicians.

The Ministry of Productive Development of Argentina has one leader: the Minister of Productive Development. Figures A.1a and A.1b show the Wikipedia pages for the Argentine Ministry of Productive Development and its most recent Minister, Daniel Scioli. The page for the Ministry of Productive Development reveals that this was a cabinet ministry. The page for Daniel Scioli refers to the individual as a politician and refers to various political positions he has held including Vice President of Argentina. Hence, we class the Ministry of Productive Development of Argentina as a political organization.

[2] For a detailed overview, see Field (2024).

Figure A.1a: Screenshot of the Wikipedia page on the Ministry of Productive Development of Argentina ("Ministry of Productive Development" 2024)

Figure A.1b: Screenshot of the Wikipedia page on Daniel Scioli, the most recent Minister of Productive Development of Argentina ("Daniel Scioli" 2024)

The Ministry of Finance of South Africa has one leader: the Minister of Finance. Figure A.2 shows the page of South Africa's Minister of Finance on Wikipedia. This states that the individual is a minister in the cabinet of South Africa. Hence the individual holds a political position. Hence, we classify the Ministry of Finance of South Africa as a political organization.

Figure A.2: Screenshot of the Wikipedia page on the Minister of Finance of South Africa ("Minister of Finance (South Africa)" 2024)

Brazil's National Bank for Economic and Social Development (BNDES) has one leader: the President of BNDES. Aloizio Mercadante Oliva is currently the president of BNDES. Figure A.3 shows his biography from BNDES's website. This includes various mentions of political positions such as being a senator and having been a cabinet minister. Additionally, there is clear mention of party affiliation. Oliva was involved in the founding of the Workers' Party, has been a federal deputy for this party as well as Chairman of the Committee on the Economy. Hence, we classify BNDES as a political organization.

The president of the BNDES, Aloizio Mercadante Oliva, is an economist graduated from the College of Economics and Administration of the University of São Paulo (USP, 1976), with a master's degree in Economic Sciences from the Institute of Economics of the State University of Campinas (Unicamp, 1989) and a doctorate in Economic Theory from the Institute of Economics – Unicamp (2010). He is a retired professor of economics at Unicamp and a licensed professor at the Department of Economics of the Pontifical Catholic University of São Paulo (PUC-SP).

He was president of Atlética and the Academic Center of FEA-USP (1973-74), presided over the Association of Teachers of PUC - APROPUC (1978-87) and was founder and vice-president of the National Association of Teachers of Higher Education – ANDES (1980-84).

Mercadante participated in the founding of the Workers' Party (PT) in 1980, having been vice president and director of international relations of the National Executive Commission. He also participated in the founding of the Workers Central Office (CUT), where he was founder and first director of the Department of Social, Economic and Political Studies (Desep da CUT), in 1984. He was a federal deputy for the Workers' Party (PT) in two terms (1991-1995 and 1999-2003), having been chairman of the Committee on the Economy and leader of the Bancada do PT (PT Caucas).

He was a candidate for vice president of the Republic with Luiz Inácio Lula da Silva in the 1994 presidential elections and senator of the Republic for São Paulo (PT) in the 2003-2011 legislature, having been the most voted senator in history with 10.5 million votes. He was president of the Senate Economic Affairs Committee, Leader of the Lula Government Support Block, leader of the PT Caucas, Leader of Congress, member of the Brazilian representation and president of the 2007-2010 Mercosur Parliament.

He was Minister of Science, Technology and Innovation, 2011-2012; Minister of Education 2012-2014; Chief of Staff of the Presidency of the Republic 2014-2015 and Minister of Education 2015-2016 under President Dilma Rousseff.

Mercadante also chaired the Perseu Abramo Foundation.

Figure A.3: Screenshot of the biography of Aloizio Mercadante Oliva, the President of Brazil's National Bank for Economic and Social Development from the organization's website (BNDES, n.d.)

China Development Bank has one leader: the Chairman of the China Development Bank. Zhao Han is currently the Chairman of China Development Bank. Figure A.4 shows his biography on the organization's website. This biography mentions that Zhao Han is Secretary of the CPC Committee. CPC stands for the Communist Party of China. Hence, this indicates that the individual

is affiliated with a political party. Hence, we classify the China Development Bank as a political organization.

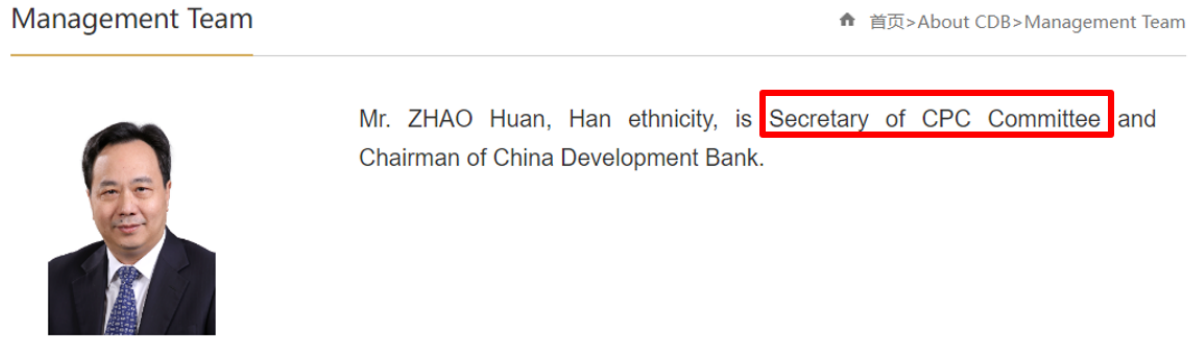

Figure A.4: Screenshot of the biography of Zhao Han, the Chairman of the China Development Bank from the organisation's website (China Development Bank, 2015)

Australia's Critical Minerals Facility has two leaders, a Chair and a CEO. Figures A.5a and A.5b show the biographies of the Chair, Debra Hazelton, and the CEO, John Hopkins. Neither biography makes any mention of political involvement. Debra Hazelton has more than 30 years of experience in global financial services. John Hopkins has more than 25 years of experience in banking.

Debra Hazelton

Chair | **Independent, Non-executive member**

Appointed
12 February 2024 to 11 February 2027

Qualifications
BA (Hons), Master of Commerce, GAICD

Debra has over 30 years' experience in global financial services, with a particular focus on Australia and Japan. During her executive career as CEO of Commonwealth Bank of Australia in Japan and CEO of Mizuho Bank in Australia Debra led businesses focussing on Treasury, Debt Capital Markets, Project Finance and Corporate Finance. She also has senior executive experience across risk management, global financial trading markets as well as international business development and global human resources.

Debra is an experienced non-executive director and currently also serves as a non-executive director on the boards of Australia Post, Treasury Corporation of Victoria and Persol Co. Ltd (Tokyo Stock Exchange: 2181). Debra is also a Vice President of the Australia-Japan Business Cooperation Committee (AJBCC). She is a previous chair of AMP Ltd and AMP Bank (ASX:AMP) and non-executive director on the boar Australian Financial Markets Association (AFMA), Asia Society and the Australia-Japan Foundatio Co

Figure A.5a: Screenshot of the biography of Debra Hazelton, the Chair of Australia's Critical Minerals Facility from the organisation's website (Export Finance Australia, n.d.)

John Hopkins

Managing Director & CEO | **Executive member**

Appointed	**Qualifications**
2022	BEc (Soc.Sci) (Hons), LLB, Grad. Dip (Postgraduate Law)

John was appointed Managing Director & CEO of Export Finance Australia in August 2022. He has more than 25 years' experience in the finance, corporate and government sectors, with an international career focused on risk, legal and operational roles.

Prior to joining Export Finance Australia, John held various senior management positions at Westpac, Goodman Group and National Australia Bank in Sydney, London and New York. During this period, he advised on a broad range of transactional and corporate matters, including major financings, capital raisings, domestic and cross-border governance, regulatory and compliance issues.

John joined Export Finance Australia in 2012 and played a central role, both as Chief Operating Officer and Chief Risk Officer, in overseeing the expansion of Export Finance Australia's mandate and th of complex financing transactions in support of Australian business and key government policy objectives.

Figure A.5b: Screenshot of the biography of John Hopkins, the CEO of Australia's Critical Minerals Facility from the organisation's website (Export Finance Australia, n.d.)

The Solar Energy Corporation of India has one leader. R.P. Gupta holds the positions of both Chairman and Managing Director. Figure A.6 shows his biography available from their website. This makes no mention of political involvement. He has worked as a civil servant in various energy and resource related government agencies.

R. P. GUPTA

Sh. R.P. Gupta is retired IAS Officer of 1987 Batch, Gujarat Cadre. He joined as Chairman & Managing Director of the Solar Energy Corporation of India Limited (SECI) on 15th June 2023.

Before joining SECI, he worked in the Ministry of Environment, Forest & Climate Change as Secretary, Govt. of India.

He has also worked with NITI Aayog, Ministry of Coal and has experience in corporate management, economics, statistics planning and program implementation. His areas of expertise are energy, environment, climate change, decarbonization strategies, carbon market & trading, sustainability, resource efficiency and material recycling, forest and wildlife.

He graduated in Aerospace Engineering from IIT, Kanpur. He began his career in Rajkot and subsequently worked in Gandhinagar, Bhavnagar, Dangs, Kutch, Mahesana, and Vadodara.

SECI is a Miniratna CPSU under the aegis of Ministry of New & Renewable Energy (MNRE) and is the only CPSU dedicated to the renewable energy sector. SECI is one of the nodal agencies designated by the Govt. of India for implementation of schemes related to RE capacity addition in the country. SECI has 'AAA' rating and has a Category-1 power trading license. SECI is playing key role in India's Renewable Energy growth.

Figure A.6: Screenshot of the biography R.P. Gupta, the Chairman and Managing Director of the Solar Energy Corporation of India Limited available on a document linked on the organisation's website (SECI 2024)

Russian Railways has one leader: the President of Russian Railways. Oleg Belozyorov is the President of Russia Railways. Figure A.7 shows his biography on Wikipedia. This biography refers to him as a politician.[3]

[3] It is worth noting that the biography mentions that he has served as Deputy Minister for Transport. The position of Deputy Minister is generally a civil servant position. In a general case, we might investigate this further. However, there is no need in this case, as the individual is referred to as a politician.

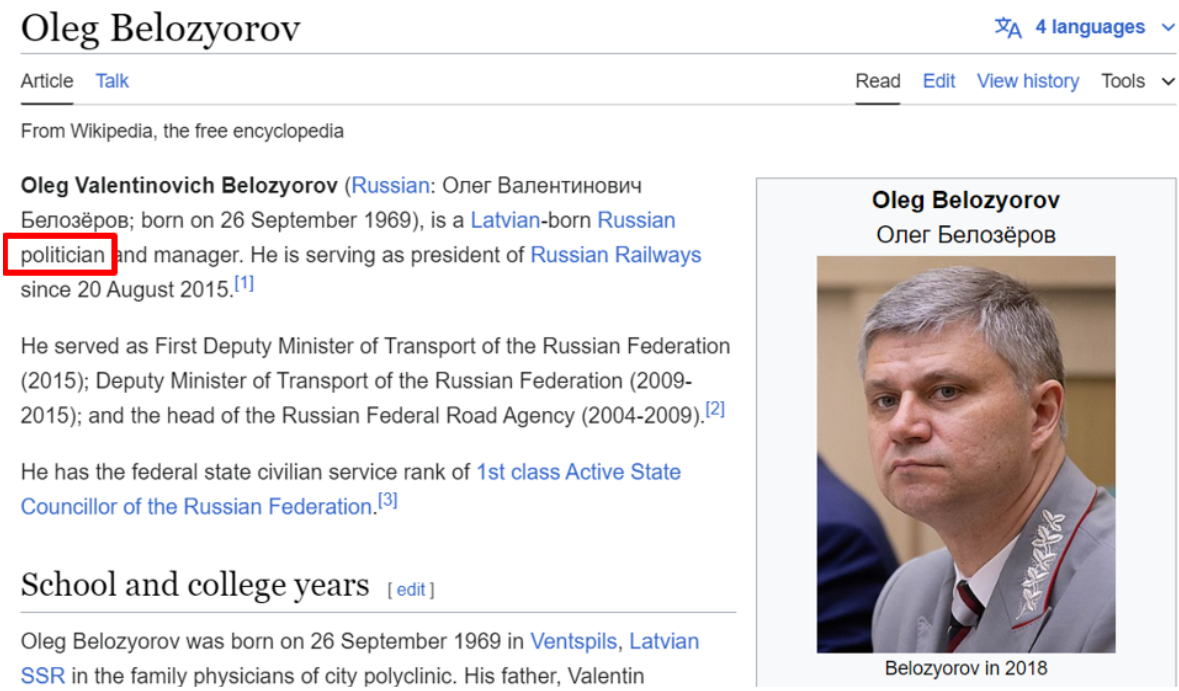

Figure A.7: Screenshot of the Wikipedia page on Oleg Belozyorov, the President of Russia Railways ("Oleg Belozyorov 2024)

The Saudi Arabian Saline Water Conversion Corporation has one leader: its Chairman, Abdul Rahman Bin Abdul Mohsen. Figure 8 shows his biography on the organization's website. This notes that he is the Minister of Environment and Water and Agriculture. Hence, we classify the Saudi Arabian Saline Water Conversion Corporation as a political organization.

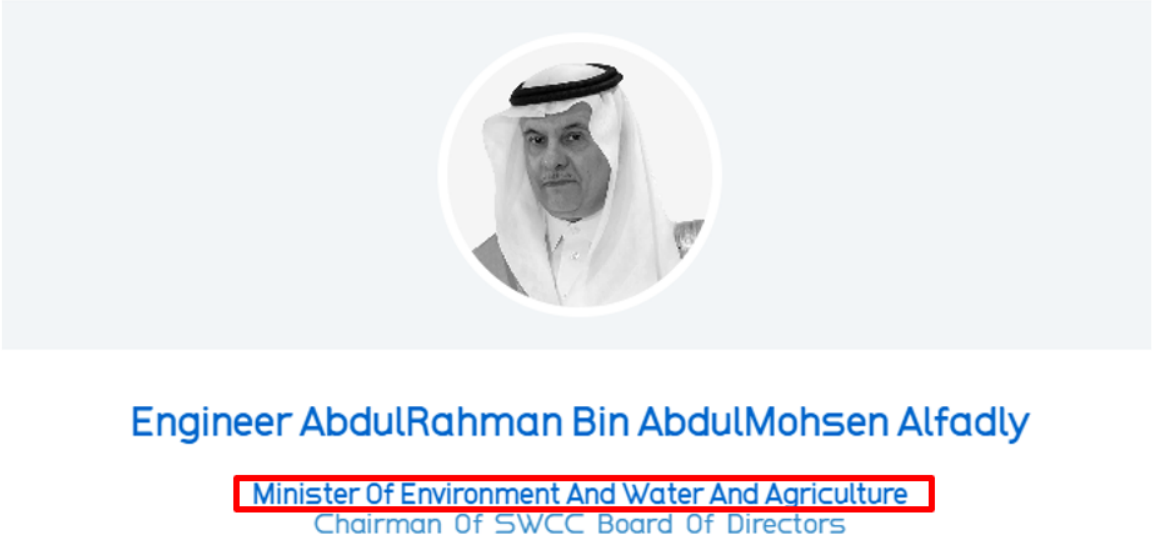

Figure A.8: Screenshot of the biography of Abdul Rahman Bin Abdul Mohsen Alfadly, the Chairman of the Saline Water Conversion Corporation of Saudi Arabia (SWCC, n.d.)

B. Data Sources Used

Industrial policy – We use the dataset on global industrial policies from Juhász et al. (2022).

Meritocratic recruitment – We use the Varieties of democracy dataset, "V-Dem Dataset V14". Specifically, we use the variable "v2stcritrecadm", which captures the criteria for appointment decisions in the state administration. We use the values for the year 2010.

Data source: Coppedge, Michael, John Gerring, Carl Knutsen, and Staffan Lindberg. 2024. "V-Dem Dataset V14." Varieties of Democracy (V-Dem) Project.

Income classification – We use the World Bank classification that categorizes economies into four income groups: low, low-middle, upper-middle, and high income. We group middle income countries together. The method uses gross national income (GNI) capita in US dollar, converted from local currency using the World Bank Atlas method. We use the values for 2010.

Data source: https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html

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